League of Women Voters of Minnesota Records

Copyright Notice:

Version 3
August 20, 2018

League of Women Voters of the U.S.
1200 - 17th Street, N. W.
Washington, D. C. 20036

January 15, 1968

EXPANDING CITIZEN INVOLVEMENT IN CONSERVATION

Mrs. William S. Morgan, Director
League of Women Voters of the United States
to the
Annual Convention of the
Oklahoma Association of Soil and Water Conservation Districts

For me, 1967 will be remembered as the year of discovery and appreciation for the Soil and Water Conservation Districts. In earlier years, I had known a little about your work; a District Supervisor is a family friend, and I had seen your organization listed in various League publications on water resources. Then about a year ago, your national president, Mr. Sam Studebaker, invited me to the Convention which met in Cincinnati in February. Since that invitation, I have been reading your pamphlets and newsletters rather faithfully. I have been talking with some of your leaders and thinking about the challenging position in which you find yourselves at this stage in your history.

In fact, your present position is so downright challenging that I have found myself journeying to several other state conventions, to discuss your future with District Supervisors, enjoying every minute of getting acquainted with SWCD people in Florida and Iowa, in Kansas and Tennessee. Naturally, I am delighted that Mr. Hill invited me to meet with you, my fellow-Oklahomans, to talk with you about citizen involvement and to hear about some of the plans you have for the year ahead.

I am delighted because this is my bailiwick and I value the chance to follow your progress firsthand. Now that I have discovered you, and have learned to appreciate your goals, I am eager to follow your steps toward increased effectiveness in the months ahead. I can watch for you on the teletype in our radio station. I can read in the local papers about your progress with the Legislature. Hopefully, I can talk with some of you on occasion about the broader base of citizen involvement you wish to attract.

From what I have learned about your activities, I understand you see additional needs and new prospects for service to Oklahoma. Mr. Philip Glick, until recently the distinguished legal counsel for NACD, expressed the need very well, I think, when he wrote in March of last year about the coming transformation of Soil and Water Conservation Districts. You remember Mr. Glick said, "What the current situation requires is the kind of leadership that will ease the task of decision that history has placed upon supervisors and legislators by pointing the way in words that are clear and bold."

I hope with you, that the clear, bold words to be spoken here in your panels and group discussion meetings will be followed by a bold action in the months ahead. Truly it would seem that you stand before a new gateway in planning for your future. From what I have read, I would judge your gateway is marked with the words, "Here Is An Idea Whose Time Has Come." And if I understand the situation correctly, you will be deciding how you will approach that idea ... how you will tackle the coming responsibilities of the Soil and Water Conservation Districts in the state of Oklahoma.

You will be considering how best to expand citizen interest and governmental interest as you decide priorities for future action.

Your quest for increased citizen understanding and increased citizen involvement interests me very much indeed. To expand citizen participation in governmental affairs is the purpose of the League of Women Voters. We try to encourage more people to take active interest in government -- to demonstrate that the informed citizen CAN influence what happens in government and how. So you can understand why your unique history of citizen involvement, and the transformation possibilities ahead of you, are bound to intrigue a member of the League of Women Voters.

In reading about your history, I have learned a great deal about the Soil and Water Conservation movement since the 1930s, and I like what I have learned. For one thing, I discovered that you learned an important fact of life about increasing citizen commitment at the very beginning of your existence, when you found that the Demonstration Projects of the mid 1930s had very little carry-over after the landowners' contracts expired. You learned that the whole process of soil conservation was much too complicated for the farmer to continue improvements under his own steam at the end of his contract -- that he didn't become permanently committed, simply through observing and carrying out instructions. You were 30 years ahead of your time in realizing that you had really to involve people -- the people doing the job -- before conservation and resource development would be continuing and successful.

My organization, the League of Women Voters, has had somewhat the same history. We, too, learned early that people-involvement is the key to dynamic citizen action. The Peace Corps and VISTA and the Community Action Programs in OEO certainly are based on this same idea -- the idea that those who carry out a program should be involved in deciding what that program is to be.

But even with this insight, often we are inclined to take a short cut. Because we feel we are more experienced, we want to tell others how to do the job. This is true in the League of Women Voters. It may even be true of you. Let me illustrate what I mean. A couple of years ago, our Education Fund received a grant from the Sears Roebuck Foundation to run some pilot projects in large cities to see what could be done working for effective citizen education in ghetto areas. Because we felt that something tangible was needed as a starter, the first projects concentrated on registration and get-out-the-vote drives.

Goodness we learned a lot! We learned that what motivates a suburban housewife and her husband to go to the polls was a far cry from what motivates a slum-dweller citizen in an inner city. Never having experienced what could be achieved through the vote, these people simply couldn't make the connection between the issues in which they were interested and going to the polls to make their voices heard. In beginning to work with them and their neighborhood leaders, we found our League materials could not be understood; we found our motives were suspect; we found out all sorts of things. We have proven once again what we suspected all along -- that our ideas, fine though we think they are, simply cannot be superimposed and gratefully accepted by our friends in the inner city. Sometimes painfully, always slowly, we and they came to realize that central city residents are more likely to become interested and aware of their citizen power when they are personally involved at the earliest planning stages.

For instance, we learned that voting registrars coming in from outside the neighborhood wouldn't do; registrars from the neighborhood itself would have to be trained to do the work, often at night when they were home from their regular jobs.

We learned that the Go Vote flyers and posters and radio announcements which appeal to suburbia had to be cast aside, and other materials developed, either by or with the careful advice of inner-city leaders -- materials which would relate directly to needs and hopes of the inner-city residents. We learned that instead of using words to tell a story, we should use cartoons and stick drawings and pictures in bright colors.

But perhaps the most important discovery was this -- and here I quote from a report of a League actually involved in such a project. They said, "We held a number of planning meetings (with the inner-city residents) before we ever swung into action. The meetings started in the summer, continued all through the fall and winter, and our registration drive didn't begin until January. We were meeting so often, doing so much talking, and there was so little action that our League women were beginning to feel very doubtful about the whole project.

"We didn't realize at the time that the real value of all these meetings was that we were getting to know each other on a very basic level. There was some hostility and I'm sure widespread doubt on the part of the Negro members of the committee as to the motives of the white committee members. Some of the meetings deteriorated into bull sessions, but in the process a lot of chips got knocked off shoulders and were replaced by a much more realistic understanding of the motives and attitudes of committee members."

I have dwelt on this attempt at communication and involvement at some length, because I believe it holds great relevance in your planning for the future. It reminds me of the philosophy of John Gardner, who said, you know, when he took over his post as Secretary of Health, Education, and Welfare: "We are all faced with a series of great opportunities, brilliantly disguised as insoluable problems."

You have capitalized on great opportunities all through your history. I have learned that your Districts are run by local people and that you have learned to work with others who share your interest in conservation. I found that, in the Thirties, pioneers in your movement made great efforts to communicate personally and directly with farm people in order to bring them into soil conservation districts. The growth and strength of your Districts displayed in this meeting of your state association demonstrates how well you succeeded in mastering the techniques of communication with those of like occupations.

Of course similar ways of earning a living always make it easy for people to communicate. They have a lot of things to talk about that interest them even if they are only casually acquainted. Having learned to work with like groups perhaps now is the time to seek out areas of mutual interest with those whose background and environment you feel to be quite different.

Actually differences between rural and urban residents have become less in recent years. Rapid communication, by road and automobile, by radio and TV, by telephone and newspaper, exposes rural and urban people to the same influences at the same time. We are growing more alike every year.

Soil and Water Conservation Districts -- you who are spiritually dedicated to the land -- should be expanding your interests, increasing your scope and participation, serving suburban and exurban citizens -- even urban people -- as well as farmers in Oklahoma. Let's face it: if the land is going to be preserved, it cannot be done by farmers alone, because there are fewer and fewer of you. The population movement out of the farm arena into broader areas is increasing. There is a shrinking agricultural base and this base will not again increase.

Rurbanization -- that brand new dictionary word which begins with an R and which connotes the spectacular phenomena where urban developments spill over into rural farmlands -- is a reality.

Faced with this situation, how do we forward your objectives. Very simply, you must enlarge your troops by strengthening your alliances with non-rural groups which have the same interests in whole or in part, as your interests.

And this is a matter of communication. It may be a matter of broadening your purpose and choice of people who serve on state and local commissions. It well may be a matter of compromise, as you begin to seek wider solutions to resource management in the months to come.

In reaching out to the people in new areas you will want to maintain an adequate agricultural base to be sure, but because of your unique structure and purpose, your organization is specially suited to spearhead a broader development.

Now I am quite aware that this approach may be disturbing to many of you. You are good stewards of the land and water and naturally you feel safer in retaining planning and implementation in your own hands. But it is possible that the healthy continuance of the Districts, and of the values you wish to preserve, will depend on your willingness to enlarge your circle and your willingness to change.

I repeat, successful advancement of an organization's ideas today, particularly in fields like yours and mine requires working with other organizations and people of other types who share some of our interests. In a large and diverse country, with a wide spread of concerns, where everyone is a plural man, a multiple-faceted man, small and single-purpose blocs don't get very far. Except, that is, as they develop natural allies on whom they can depend, and/or have contacts with larger groups from whom they draw support less regularly.

It becomes your responsibility to communicate the values of natural resources to those less well informed. The main task of a Supervisor is no longer to convince a farmer to stop a gulley; now a Supervisor needs to convince the Lions Club, or some similar group, of the importance of their nearby resources -- to help the members of that non-farm group learn what they have, the problems and the opportunities in soil and water management.

I believe there are enormous values to be gained when Soil and Water Conservation District Supervisors expand their communication with non-farm people. In the first place, we need a continuing dialog between farm and non-farm people. Why shouldn't that dialog be carried on in Soil and Water Conservation Districts? Secondly, I firmly believe your qualities of self-development, self-improvement, independent operator self-reliance should not be lost. These assets WILL be lost by isolation! I believe it is important to America that these qualities should be passed on to others by teaching and training them in your methods. Urban people can profit by contact with you; farm people can profit by listening to the concerns and ideas of their urban friends.

Turning inward is the way to atrophy; turning outward is the way to life.

Nowadays the differences are between income levels, between levels of education, but not between rural and urban residents. There is no evidence across the United States that non-farm people are antagonistic to farmers. Bankers, agricultural equipment dealers, other retail merchants and service people are all good friends of farmers.

Farmers now, in their own interest, need friends. And you must find those friends in the towns and cities, because there is no place else to go for people. If you want federal or state appropriations or legislation, you need friends in town, because there are no longer enough farmers to win these things by themselves.

You need to associate and work with people in the county seat towns. These are the townspeople who have a ready-made interest in farmers and farm problems. The people in these larger towns and small cities have a selfish interest in farmers'

interests. They are the townspeople with whom you market and the ones affected by land and water resource management.

The nation needs the help of expanded Soil and Water Conservation Districts. These are government enterprises that should work, especially in this day when emphasis is put on focusing on a problem, focusing all governmental programs that will help solve the problem no matter what their bureaucratic position. This is the new phrase: the systems analysis approach. Soil and Water Conservation Districts could be the valuable coordinating mechanism, but not only for rurally-focused programs. If you do not rise to the challenge, to the opportunity for greater service, some other arrangement -- without, alas, your experience -- will have to be used.

Now, having had the temerity to suggest you should raise your sights and expand your objectives -- that indeed you have the ideal structure and technical experience and legal base to qualify as a spearheading group in expanded citizen involvement in conservation -- I should like to speak on techniques for spreading conservation effectiveness.

A few months ago, our national League president was preparing a talk for a meeting of deans and counselors of young people. While doing her homework, she came upon a statement by Dr. Daniel C. Fullmer from the state of Oregon, which has profound implications for all of us concerned with expanding citizen participation. Dr. Fullmer said, "We professionals have been playing with the word 'motivation' for years. We have been treating it as an antecedent (as something which comes before particiation). Motivation," said Dr. Fullmer, "is not an antecedent; it is a consequence. I am motivated because of experiences I have had; I am not motivated to have experiences."

Now I suppose that in a general way we knew that was true, but it had never been articulated in quite such clear terms. We have tested this idea in the League of Women Voters and it makes good sense. The idea that motivation is a consequence of experience and not an antecedent has great relevance to the question of expanding citizen interests in conservation also.

We are working into an important principle of opinion-building -- the identification principle: to accept an idea or point of view, the people we are trying to reach must see clearly that it affects their personal desires, their hopes, or their interests. The principle of identification has to do with self-interest. The problems which concern us must be made meaningful to others, in ways that are observable and measurable from the point of view of their lives, in ways they will understand, and which will cause them to act.

How do we do this? Mainly it requires the ability to see things as others see them. We project ourselves into the minds of other individuals or persons belonging to other organizations whose background and points of view may be quite different from our own. This requires understanding and imagination, but you are imaginative people, and this ability for pinpointing the attitudes and emotions of others often makes the differences in bridging the communications gaps which concern us now.

There are two other principles for creating favorable public opinion which are equally important. The first is the principle of trust. The receiver of the ideas or opinions or points of view -- the person we hope to motivate -- is not likely to listen or to believe us, unless he has confidence in the source. This is the principle of familiarity and trust.

And another principle is the action principle. People do not buy ideas separated from action -- either action by the sponsors of the idea, or action which people themselves can conveniently take to prove the merit of an idea. Unless a means of action is provided, people tend to shrug off appeals to do things.

Identification, trust, and action -- how would you rate yourselves on these in your relationships, farm organization to non-farm public, rural or rurban to urban citizens? Are there keys here, to help us help more Oklahoma citizens identify with conservation concerns?

Just what are the conservation interests and worries of the non-farm citizens in your locality? In my community, a small city near a metropolitan area, we are worried about pollution in our new Lake Thunderbird, which has become our main source of water supply. We worry about land use and erosion from new housing developments and highways. We are concerned about precious open space in the rurban areas being spoiled by unsightly junk yards and taverns. We fought to keep a state highway from slicing through a wildlife refuge.

Your neighbors in the towns and suburbs have serious conservation problems too. What can we do to help one another? If you believe there is hope for melding our interests, then my first suggestion is that you must provide the experience which will bring about the motivation. You must attract attention.

In my organization, we are great exponents of the go-see trip. In our study of water resources, we often go see for ourselves the sources of our water supply, the way in which a watershed is managed locally, what the park and recreation assets are in the area and even the inner workings of the local sewage disposal plant. I suggest that the leaders of your nearby towns and cities would be pleased and flattered with an invitation, on an early Saturday, to go-see what you have done in your county. The tour should end with a get-together where the dialog can be continued over coffee; you want a chance to hear what their conservation problems are too!

Next, you should start now to get rurban and urban representation on your boards. Or if that is impossible under your present state laws, you might start with an advisory committee of non-farm citizens. Invite your non-farm power structure to an experience few of them have had in a decade -- a fried chicken dinner in the country -- and begin the dialog with them at the same time.

But make no mistake about it, there must be give and take. Too often "communication" has been a euphemistic way of saying influence, and influence in one direction only. Let's admit that there are tensions and that the problem is to understand what other groups have in mind and that solutions are often compromise, not just smoothing over differences or riding roughshod over the opposition. And here I think you have to keep in mind that the more support you seek, the more compromise is required. As you broaden your base of support, to include those whose aims are not identical with yours, the more adjustment is necessary to accommodate to different points of view. Differences of opinion and the tensions that inevitably arise should not be shunted aside but be utilized.

I'm sure you know that civic organizations provide one of the most important channels through which information reaches the public, is discussed, and crystallizes into support. There are many ways to reach urban and suburban organizations, with or without interests similar to yours. Dozens of organizations in your nearby towns are looking for lively programs. You can send them a speaker, preferably armed with a few colored slides to show and tell what is going on in the county. If you have inexpensive flyers or fact sheets about the work you are doing, send

along enough copies for every listener to take one when he leaves. You want to provide an interesting experience, but you strengthen the chance for motivation when you offer a small pamphlet for later quiet reading.

And of course, once you have aroused the interest of a group in what you are doing through a go-see or a speaker, you have a logical reason for sending follow-up reports, or your newsletter, or a group invitation to a workshop or upcoming election.

But I want to repeat what I said earlier -- YOU must attract attention. YOU will need to initiate the communication. You can't wait for the city fellow to come to you to get the word, for that will never happen. A true leader needs to seek out the audience and not wait for converts to come. A true leader will seek out opportunities to spread his message and will not wait placidly for invitations to come to him.

In gathering information from a few of our League Water Resources Chairmen about this subject, one said she is devoted to the Soil and Water Conservation District people in her county. She said you have all sorts of wonderful things to offer organizations and schools, but, she said, "You really have to seek them out and ask for what you would like!" For example, she said you have splendid programs on soil erosion to present to schools.

Recently the state president of the League of Women Voters of Ohio discovered you too. She sent a memo to all the Ohio Leagues telling them about her discovery. She wrote:

> "In each county is a Soil Conservation District providing the technical services of engineers, soil scientists, field biologists and foresters, free to public and private landowners upon request. Many schools and laboratories have begun to take advantage of this opportunity. Enclosed is a list of Conservationists and a map of the Districts of Ohio. Locate yours and contact at once for all kinds of valuable information and help for your community."

Our two organizations combined forces in Fairfax County, Virginia, in an excellent example of cooperation between the League and the Soil and Water Conservation District. It all grew out of a League study of county planning policies and their implementation. Part of the League concern in this rapidly changing area was in bad land usage which resulted in erosion and siltation. Early in their study, they discovered that the Soil and Water Conservation District had similar concerns. And so they toured the county to study erosion problems firsthand, with many of your people serving as their tour guides.

They say the District provided the League with many of the slides which were used in a speech-and-slide presentation which the League presented before the Fairfax City Council, before heads of public agencies convened by the Fairfax Board of County Supervisors, and to 51 interested groups in the county. As a result of this educational work and ensuing citizen action, effective ordinances were passed -- laws with teeth but not so many teeth that enforcement is impossible.

Examples of this budding love affair between the League of Women Voters and your Districts would not be complete without telling you about Westchester County, New York. Here the several Leagues of the county, after long study and discussion and group decision, agreed to support the creation of a Westchester County Soil and Water Conservation District. They reported:

"The Soil and Water Conservation District was seen by the Leagues as the quickest and most efficient way (1) to obtain comprehensive, multi-purpose flood control plans for the small streams in the County, under Public Law 566, and (2) to meet the growing need for sediment detention, for the preservation of the marshes, swamps, and open space, and for flood plain zoning. The soil survey, Leagues agreed, would aid planning commissions; help in the control of polluted water from septic systems and in the protection of well water supplies; help check soil erosion throughout the County; aid in the development of the County's wildlife and recreational resources before it is too late in our rapidly growing County."

In implementing this decision, they first initiated an all-out educational program which included educating local and county officials. They explained what a SWCD was, what it could do for the county and areas within it, how only those areas requesting help would receive it, the negligible cost to the county and the variety of benefits that could be received.

Leagues have been working in planning and zoning and water resources for all these years, and we hope that more will establish warm associations with you people in the Districts. Now that you know how our interests dovetail, I hope you will be more aggressive in letting Leagues know how you can help them. Our members in Oklahoma need your information about agricultural land and water problems. You are the specialists on this aspect of a topic in which we have a general interest. We need your expertise. We can share our concerns.

I think you will discover other organizations have similar links to your programs. You may recall my reminder that most individuals are plural, and the obvious way to use pluralism is to find the members of your association who are members of other associations. If influence is to be felt, it is far better -- even essential -- that it come from within rather than from without. In other words, your own members are links with other special audiences you hope to reach.

Perhaps the other organization will have only a casual, courteous interest in the conservation problems which mean so much to you. If this turns out to be true, be not dismayed. You can offer a good program at least, with plenty of opportunity for member discussion and feedback. Just remember that we take ideas and information to people where they are, geared to their interests, their concerns, in their language if possible and in a way in which they will enjoy the experience and open their minds to the problems. Always include possibilities for action by individuals, if you find that the organization as a whole is not to cooperate, for you recall that people do not buy ideas separated from action. You never know when a spark will be struck which will fire another individual to far-reaching conservation interests.

But if, as I like to think you will find, the other organization turns out to be a dedicated partner in your efforts, these final, gentle hints are in order:

- First, include them in your planning from the first stages. I don't know of many groups worth their salt which will take on a cooperative effort without expecting they will have an important role in general planning and strategy. In this sophisticated day, we simply cannot superimpose ideas and have them joyfully accepted. The League has earned a Purple Heart or two, learning that the hard way.

- Next, try to include cooperating organizations and individuals in all your promotion plans -- in feature newspaper stories, in panels on radio and TV, in manning the speakers bureau, in co-sponsoring a public seminar or other special event. You should even welcome controversy

among cooperating groups, for conflict is not only a way to get an issue talked about and understood, but the compromise that almost inevitably follows the talking out of an issue usually results in moving ahead. A certain intellectual humility involving a willingness to respect other persons and interests as legitimate can actually help others who are seeking to determine the shape of public policy.

- And third, see to it that the other groups and their leaders get the giant share of the accolades and credit when success comes.

You can see I offer no easy, simple way for building a favorable climate or opinion toward the worthwhile goals which mean so much to us. Two generations ago, the task undoubtedly was much easier. Life was less complex; there were fewer associations seeking the ears and commitment and the action of other citizens. In the olden days, we tended to idealize our role as motivators: we believed that it was enough to inform ourselves and our members, and then, by some magic, we thought little ripples would emanate outward which eventually would touch the hearts and minds of hundreds of others, to bring about the understanding or changes we were seeking.

In the latter half of the 1960s, faced with highly skilled competition from hundreds of other persuaders, who are equally convinced <u>their</u> objectives are all-important, we now know that we cannot be very effective unless we maximize our efforts at communicating.

Which brings us back, once again, to our motivating role. Our message must be given in terms that will touch the personal interests of the receivers ... who will be influenced by, or adopt, only those points of view extended by those in whom they have confidence. And a means of action must accompany the ideas, or the appeal will be shrugged off.

From this, I hope we have recognized citizen cooperation and effectiveness require more than an announcement of our meetings in the local newspaper. It is more than gathering together a few like-minded friends to agree once again that we are on the side of the angels. Cooperation is even more than a wonderful speech to the Rotary about your record in Soil Stewardship.

Real motivation and effectiveness occurs when through person-to-person involvement you will have more friends willing to think through, weigh choices, find agreement and become committed to the goals all deem important, and have opportunity to act. It is up to you to create a climate, in which more individuals can make up their minds and act. Turning outward may cause a few of your District's muscles to creak, but therein, I am convinced, lies your future.

# # # # #

LEAGUE OF WOMEN VOTERS
OF THE UNITED STATES

1200 SEVENTEENTH STREET, N. W., WASHINGTON, D. C. 20036 TEL. 296-1770
Mrs. Robert J. Stuart, President

February 6, 1968

Mrs. O. J. Janski, President
League of Women Voters of Minnesota
6500 - 2nd Avenue South
Minneapolis, Minnesota 55423

Dear Mrs. Janski:

Perhaps you would be willing to pass this on to the Minnesota water resources chairman or to someone in the Twin Cities area.

A Mr. Lincoln Paulson, President of the Minnesota Association of Soil and Water Conservation Districts, RR 5, Fairbault, Minnesota 55021, wrote to Mrs. William S. Morgan on January 15 saying that he had heard her give a talk to the National Association of Soil and Water Conservation Districts in Cincinnati, Ohio, in February 1967. (We no longer have copies of that speech, but the message was essentially the same as the one enclosed.) He wanted to tell Mrs. Morgan that the Minnesota Association of SWCDs has been trying to draw in non-rural residents of the Twin Cities area. The SWCDs have formed a metropolitan association which has met with the Twin Cities Metropolitan Planning Commission and other metropolitan groups. The metropolitan SWCDs are planning to work with the new Twin Cities Metropolitan Commission.

The League may already be working with the Minnesota Association of Soil and Water Conservation Districts and with this metropolitan group, but in any case their admiration for Mrs. Morgan should be a plus.

Sincerely yours,

Lois

Mrs. C. F. S. Sharpe
Program Specialist: Water Resources

LS:llw
cc: State LWV
Mrs. Morgan
Enclosure: The Speech, 1/15/68

office

4157 Ensign Avenue North
New Hope, Minnesota 55427
February 18, 1963

Mrs. Orval Hage, President
League of Women Voters of Duluth
1601 North 51st Ave. E.
Duluth, Minnesota 55804

Dear Mrs. Hage:

The Minnesota Pollution Control Agency will hold a public hearing February 23 in Duluth on pollution problems in Lake Superior. The hearing will start at 10 a.m. in the Bridge Room of Duluth Arena Auditorium. Would it be possible for your Water Resources Chairman, Mrs. James Alexander to attend this meeting, or if she cannot could you send someone else? I would appreciate getting a report from your League on this meeting.

We are trying to organize the Water Item at the state level. As the new chairman, I am interested in getting a committee together to work on this item. Since your area is a major water region in Minnesota, I would like someone who is vitally interested in water on my committee. This would entail covering water meetings such as the hearing mentioned above, clipping newspaper articles and generally keeping me posted on the water situation as it pertains to our national position. In turn, I hope to compile the information coming in to me and keep Leagues posted on the water situation in Minnesota.

I hope to hear from you soon regarding the hearing, and that you have found someone interested in serving on my committee.

Very truly yours,

Mrs. Leland Powers
Water Resources Chairman
State Board

Detergents in the News

Editorially discussing the cause of a "record pileup" of foam at a dam across the Baraboo River, Wis., the Reedsburg "Times-Press" recently stated:

"It probably wasn't pollution from detergents . . . , because for the past year, all detergents sold in Wisconsin have been the biodegradable types which break down to harmless compounds after they are used. Besides, oldtimers in the area can remember foam pileups on the river long before detergents ever were popular in use."

The editorial commented that the foam was probably raw or only partly treated sewage, or fertilizer runoff and pointed to a need for better sewage treatment and a change in cropping practices.

In the same issue, a regional biologist for the state's Bureau of Water Resources is quoted as saying that he did not believe the foam was caused by detergents because non-biodegradable detergents are not available in Wisconsin.

NEW PUBLICATIONS FOR FUTURE REFERENCE

(Continued from page 3)

The 67-page document briefly summarizes important Federal and California programs of financial assistance for water development, including programs for water pollution control facilities, recreation, research, and long-range planning. A typical listing identifies the program, gives the administrating agency and purpose, recipients and conditions and notes the appropriation for fiscal year 1968.

The handbook is available without charge from the Committee office, Room 2148, State Capitol, Sacramento, Calif. 95814.

* * *

The nation's most dramatic example of water re-use is the subject of an FWPCA publication entitled "Santee Recreation Project, Santee, California, Final Report."

The Santee lakes were deliberately planned to utilize the community's reclaimed sewage effluent, and by the summer of 1965, a special basin adjacent to one of the lakes was supplied with reclaimed water and used for swimming.

The report presents the results of a seven-agency cooperative study, which evaluated the fate of virus, total and fecal coliform, and fecal streptococci as waste water passed through conventional secondary treatment, sand filtration, and the recreational lakes.

Also noted are correlative physical, chemical, and biological data, and observations relating to the eutrophication, vector control, epidemiology, and the social acceptance and ecology of the entire recreational park.

The 165-page report, numbered WP-20-7, may be obtained by writing the Publications Office, Ohio Basin Region, Federal Water Pollution Control Administration, Cincinnati, Ohio 45226.

Industry's Pollution Abatement Work Is Discussed At Chemical Meeting

Industry's problems, accomplishments, and opportunities in facing water pollution issues were highlighted during a recent New York meeting of the Chemical & Specialties Management Council, an organization composed of the presidents of several dozen smaller chemical companies.

Speakers were Dr. Jacob I. Bregman, Deputy Assistant Secretary of the Interior for Water Pollution Control, and Charles G. Bueltman, Vice President and Technical Director of SDA.

Dr. Bregman said that pollution prevention must become as customary a consideration for industry as marketing products or purchasing raw materials. He also said that the burden of proof and cost should be shifted from the pollutee to the polluter.

With the predicted increase in population, economic growth, industry and output in wastes, we must be looking ahead to see how adequate secondary treatment will be over the next 5 to 25 years, he said. To do this we must become more sophisticated in our technology for detecting pollutants and their effects, and for tracing out the costs and effects of various types of advanced waste treatment on water quality.

'Unparalleled Opportunity'

The total cost for treating municipal, industrial, and other wastes in the country between 1969-73 to meet water quality standards is estimated to be between $26-29 billion. There is an upsurge of new markets in pollution control techniques, equipment, and chemicals.

Chemical companies, Dr. Bregman noted, have "an unparalleled opportunity" to participate in this market by developing specialized treatment techniques and technology for specialized problems.

"By taking advantage of these market opportunities in pollution control, you can increase your profits and, at the same time, help the nation to clean up its waters."

Mr. Bueltman stated that industry is meeting its responsibility in regard to water pollution control. "The nation's industrial community is emerging as an enlightened corporate citizen in the field of water quality, sponsoring or becoming directly involved in some of the most advanced water quality programs," he said.

Pointing out that industry helped in developing water quality standards and that many major corporations are appointing top people to responsible positions in pollution abatement work, Mr. Bueltman cited a number of examples of corporate interest in pollution control. One was a Manufacturing Chemists' Association survey that showed about a half-billion dollars had been spent on water and air pollution control facilities by 125 companies at 875 chemical manufacturing plants.

Examples Cited

Another example was that of the detergent industry, which in mid-1965 completed a voluntary nationwide conversion of its products to biodegradable materials, at a cost of more than $150 million — to solve a water problem that was strictly esthetic in nature.

"Contrary to what some people may still think, it was the detergent industry, not Government, who first began to look into this problem and set about the task of doing something about it," Mr. Bueltman stated. The industry initiated its research program as early as 1951.

"We shall continue our research efforts in enhancing waste treatment technology where we can make meaningful contributions," he said. He cited as a current example the joint industry-Government task force to recommend a program of research on eutrophication.

Rules Would Require Data From Polluters

Proposed regulations requiring any polluter in an enforcement conference or hearing to reveal detailed pollution information — including the amount and kind of wastes — have been prepared by the Department of the Interior.

Under the proposed rules, the Secretary, at the request of a majority of the conferees, is authorized to require the filing of such reports by any person whose activities result in discharges causing or contributing to the pollution of water under consideration in the hearing or conference.

(The regulations specify that no person will be required to divulge trade secrets or secret processes, Interior notes.)

Failure to file, plus continuing default for 30 days after written notice of such default, carries a $100 a day penalty until the report is submitted.

Water in the News

compiled by THE SOAP AND DETERGENT ASSOCIATION • April 1968

Program Is Adopted For Lake Michigan

Action to clean up Lake Michigan has been agreed upon by representatives of the Federal government and the states of Illinois, Indiana, Michigan, and Wisconsin. Final sessions of a lakewide enforcement conference were held in Chicago in mid-March.

Major recommendations in the 26-point program adopted by the Conferees include:

- Municipalities and industries are to treat wastes so that the effluents do not degrade Lake Michigan's water quality. The treatment must meet water quality standards for the lake.
- Municipalities are to provide waste treatment to achieve at least 80% reduction of total phosphorus. All of the above actions are to be "substantially accomplished" by December, 1972.
- Continuous disinfection is to be provided for municipal and certain industrial effluents. The municipal deadline is May, 1969.
- Discharge of treatable industrial wastes, following needed preliminary treatment, to municipal sewer systems is encouraged.
- Adjustable overflow regulating devices are to be installed on existing combined sewer systems no later than December, 1970. Combined sewers are to be separated in coordination with urban reconstruction projects, and prohibited in new developments. Pollution from combined sewers is to be controlled by July, 1977.
- Guidelines for pollution control from nuclear power plants are to be developed.
- The dumping of polluted material into Lake Michigan will be stopped as soon as possible.
- Until an ecological balance to stop alewife die-offs is achieved, such measures as skimming dead alewives before they reach the shores will be provided.
- The discharge of visible oil shall be eliminated.

It was suggested that progress meetings be held at least every six months.

President Seeks Accelerated Aid For Waste Treatment Construction

Additional financing for waste treatment plant construction, user charges, and a Safe Water Drinking Act are among proposals made by President Johnson in his March conservation message to Congress. Some highlights of his water-related recommendations are:

- In order to stimulate the construction of $1.5-$2 billion in waste treatment plants, the President recommended a fiscal-1969 appropriation of $225 million in lump-sum grants (the current practice) under the Clean Water Restoration Act. This should generate about $500-600 million of plant construction.

He also requested legislation to allow the Secretary of the Interior to make annual installment payments in addition to the lump-sum grants. This would permit the Federal government to make construction commitments to a total of $475 million in fiscal 1969, a sum that would generate a total of about $1-1.4 billion of construction.

The new financing program would require as one criterion for assistance that the municipalities impose a system of user charges on those who use the plants.

- A speed-up in reviewing remaining water quality standards and plans is asked so that the Federal government can more effectively aid in implementation.
- The President proposed a Safe Drinking Water Act of 1968, which would authorize the Secretary of HEW to develop, adopt and enforce improved standards relating to chemical contaminants in drinking water, and conduct a comprehensive study of the safety of public drinking water supplies in the U.S.
- The establishment of a National Water Commission to work with Federal, state, and private agencies in a survey of long-term water needs is sought.
- Congressional authorization of the Central Arizona Project is asked.
- Passage of an Oil Pollution and Hazardous Substances Control Act of 1968, to control oil pollution and provide for prompt cleanup, is proposed.
- The President has asked the Secretary of Commerce and the Administrator of the Small Business Administration to give priority attention to aiding industry in situations where pollution control costs may present undue financial hardships.
- The Secretary of State has been instructed to consult with other nations on steps that could be taken to launch an International Decade of Ocean Exploration for the 1970's.

Other aspects of conservation covered in President Johnson's comprehensive message include air pollution control, solid waste disposal, noise control, surface mining, highways, national parks and recreation areas, redwoods, agricultural wastes, and an action program for volunteers.

Dr. A. F. Bartsch is Chief of the National Eutrophication Research Program of the Federal Water Pollution Control Administration. See story page 2.

Water in the News
Published monthly by
The Soap and Detergent Association
485 Madison Ave., New York, N.Y. 10022
(212) 751-6080
Editor: MARY C. ANSBRO

PRINTED IN U.S.A.

More Water Standards Approved By Interior

Several more states have joined the list of those whose water quality standards, with some exceptions, have received Interior Department approval. They are: Connecticut, Louisiana, Alabama, Alaska, Montana, Oklahoma, Tennessee, Ohio, Delaware, and New Jersey.

Standards for the Virgin Islands and Hawaii have also been endorsed, and additional standards – for the Bear River – were approved for Idaho. Most of this state's standards have received earlier endorsement.

Among problems still involved in nationwide standards-setting is "the degradation issue." Interior Secretary Stewart L. Udall recently clarified his Department's position in the matter by stating that waters, whose existing quality is better than established standards as of the date on which such standards become effective, will be maintained at their existing high quality.

The quality may not be lowered unless it has been demonstrated that such change is justifiable as a result of necessary economic or social development and will not interfere with or injure any assigned uses made of, or presently possible in, such waters.

Opposition to this new Federal policy is expected from some of the states.

POLLUTION'S GALLUP RATING

According to the latest Gallup Poll, sanitation, including garbage and sewage, ranks as number 11 in a list of the 13 most important problems facing the community today. Persons interviewed mentioned crime and lawlessness nearly twice as often as any other local problem, and the Vietnam war ranked first in their minds.

LINTON REPORT: AMA TOPIC

A review and evaluation of the Linton Report will be featured at the 5th American Medical Association Congress on Environmental Health Problems, to be held April 29-30 at the Drake Hotel, Chicago.

This is the thirty-fifth of a series of articles

Working For Clean Water

NATIONAL EUTROPHICATION RESEARCH PROGRAM

In one way, lakes are like people. They are born, grow old, and sooner or later die. But while people are living longer these days, it's the other way around for some lakes.

They are "eutrophying" – and people are beginning to notice, and talk. Eutrophication is a process of enrichment, which may take thousands and tens of thousands of years to complete in the normal course of events. At times it can even be beneficial, because it increases the productivity of the waters.

However, men have recently discovered that their activities appear to be hastening this enrichment. Just as a child who eats too much candy can wind up being sick, so can a body of water that is fed too many nutrients.

Eutrophication Symptoms

The causes of eutrophication may still be puzzling, but the symptoms are plain. Some major ones are: Productivity of algae and other living matter increases, nutrient concentrations increase, dissolved oxygen depletion occurs in the deeper waters, fish species change from desirable ones to rough fish, and rooted vegetation grows in from the lake margin. The lake changes gradually to bog and eventually becomes dry land.

Not only are lakes affected, but it is now thought that rivers are also becoming more fertile and growing more algae.

There are many reasons why people are becoming more concerned about this accelerated eutrophication. For one thing, the problem is emerging at the same time that competition for limited water supplies is increasing.

The Federal Water Pollution Control Administration notes other reasons for concern: Excessive growths of algae can cause taste and odor problems in water supplies, cause distasteful odors in lakefront areas, and impart undesirable flavors to fish. Recreational use of water can be deterred not only because of appearance, taste, and odors, but the fact that some algae have jelly-like surface materials that can glue a swimmer's hair together and cover the surface of his body.

Algae can impair the assimilative capacity of surface waters so that they cannot effectively accept as much of other kinds of wastes. Property values along affected waterfronts can drop drastically. Some blue-green algae are toxic to livestock, pets, and wild animals. Excessive waterweeds can interfere with boating, fishing, swimming, and free drainage of water through various canals.

What can be done about these problems? The FWPCA is trying to find out through its national program of eutrophication research. Such research is necessitated by the fact that eutrophication is a complex subject, involving some factors and interrelationships between organisms, nutrients, and the environment that are difficult to assess. Adding to the puzzle is the fact that some lakes show no evidence of eutrophication at all.

This National Eutrophication Research Program (its official title) is now centered at FWPCA's Pacific Northwest Water Laboratory. Completed in 1966, the $2,500,000 facility is located in the heart of the Willamette Valley adjacent to the Oregon State University campus at Corvallis.

It has nationwide responsibility for basic and applied research involving not only eutrophication but also coastal pollution, and three aspects of industrial waste treatment and control – waste heat from thermal power production, wastes from potato processing, and the many wastes from the manufacture of pulp, paper, and allied products.

The lab's still-growing staff of some 80 scientists and engineers and a small corps of administrative personnel is directed by James L. Agee, former Chief of the Water Quality Standards Staff at FWPCA's Washington headquarters.

Research Objective

NERP's Chief, Dr. A. F. Bartsch, has the responsibility of "planning, developing, and operating a program of research having the objective of developing a technology to save lakes and other waters from accelerated aging processes." He also serves as a technical consultant to Federal, state, and other agencies in connection with water problems.

Highly respected in his field, Dr. Bartsch has been associated with the Federal water pollution control program for the past 19 years, serving at Portland, Ore., Washington, D.C., and the Taft Center in Cincinnati. He was Chief Biologist in Washington, and before assuming his current position was Director of Research in the Pacific Northwest Water Laboratory. Dr. Bartsch received his undergraduate training at the University of Minnesota and his Ph.D. from the University of Wisconsin in 1939, specializing in aquatic biology.

With a fiscal-1968 budget of $375,000, he and his staff, now numbering 22 in all, carry on the one-year-old eutrophication research program at Corvallis – an operation that is growing both in human and physical resources as well as in the scope of problems being attacked. (The

(Continued on page 3)

MCA Prepares Booklet Of Student Experiments

A booklet of 18 experiments relating to air and water pollution and waste disposal has been prepared for use in schools by the Education Activities Committee of the Manufacturing Chemists' Association. A Teacher's Manual is included.

Entitled "Scientific Experiments in Environmental Pollution," the booklet was edited by Elbert C. Weaver of the faculty of Southern Connecticut State College. While the experiments suggest ways to solve the problems presented, MCA notes that the booklet is not a collection of "cookbook laboratory experiments." Students are also encouraged to work out their own ideas.

The experiments were designed to bring to students an awareness of environmental problems, the need of accuracy in assessing them, and some difficulties involved. Subjects range from detection of impurities in water, to biodegradability of solids, to estimation of the concentration of impurities in air.

The booklet is available, at $1, from Holt, Rinehart and Winston, 383 Madison Ave., New York City 10017. Information about MCA's over-all educational program may be obtained from Dr. William E. Chace, Director of Education, MCA, 1825 Connecticut Ave., N.W., Washington, D.C. 20009.

FWPCA PROGRAM SPURS EUTROPHICATION RESEARCH

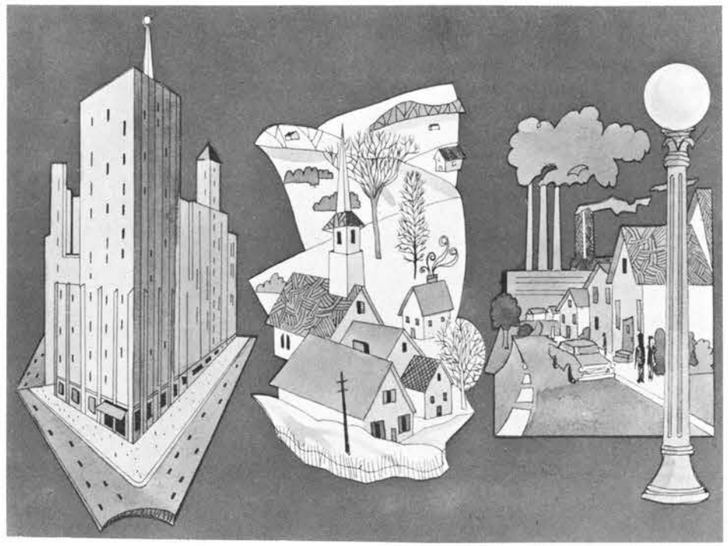
(Continued from page 2)

laboratory's address is 200 South 35th Street, Corvallis, Oregon 97330.)

In addition, the FWPCA program includes a sizable grant- and contract-supported research effort budgeted at about one million dollars for fy 1968. This is actively underway at several universities across the nation. Added to this is nutrient removal research with a fiscal-1968 budget of $140,000 for in-house effort and $930,000 for grants and contracts.

The grant research involves subjects such as oxygen resources and eutrophication of tidal waters; detection of limiting and surplus nutrients in algae; algicidal and algistatic properties of chemicals; analytical methodology in algal cultures; nitrogen cycle in lakes; ecology of blue-green and other algae; productivity in estuarine water; effect of phosphate mining wastes on estuarine ecology; algal nutrient assimilation rates; limnology of lakes, reservoirs, and rivers; and effects of watershed practices on water quality in forest streams.

More information on the timely and important Federal research program will appear next month in this column.



CLEAN WATER – ITALIAN STYLE: "It's Your Decision – Clean Water," the prize-winning film co-sponsored by SDA and the League of Women Voters of the U.S., is being translated into Italian by the U.S. Department of Commerce, so that the film may be shown in the Water Pollution Control Equipment and Materials Exhibition at the U.S. Trade Center in Milan, Italy, April 14-25. A scene from the animated color film is shown above.

New Publications For Reference...

Three new studies on the economic impact of water pollution control activities have been completed under the direction of the Federal Water Pollution Control Administration. They are:

- "Economic Impact on Affected Units of Government," which considers the economic impact of the capital outlays required to attain water quality standards. This is available from the U.S. Government Printing Office, Washington, D.C. 20402; price, $2.50.
- "Water Pollution Control, 1969-1973, The Federal Costs," which estimates that an optimum program to implement the Federal Water Pollution Control Act and help communities, states, and industry fight water pollution will cost $3.3 billion over the next five years. Copies of this – and the following report – are available from Room G-100, 633 Indiana Avenue, N.W., Washington, D.C. 20242.
- "Incentives to Industry for Water Pollution Control: Policy Considerations," which examines possible plans for aiding industry in complying with water quality standards. In place of any incentives plan, the report recommends the establishment of river basin agencies to handle all waste treatment in their areas, because only this method "will produce abatement in an efficient and equitable manner."

* * *

Promoting scientific research and increasing public understanding of Great Lakes problems is the goal of a new organization, the Great Lakes Foundation, headquartered at 2200 North Campus Boulevard, Ann Arbor, Mich. 48105.

A non-profit corporation, open to the public, the Foundation is headed by Bruce L. Simpson, president of National Engineering Co., Chicago, who is chairman of its board of trustees, and David C. Chandler, Director of the Great Lakes Research Division, University of Michigan, president. The Foundation has just published the first issue of its quarterly magazine, "Limnos," which has the Great Lakes as its central theme.

* * *

A revised and expanded edition of its publication, "Handbook of Federal and State Programs of Financial Assistance for Water Development," has just been released by California's Assembly Water Committee, according to an announcement by Assemblyman Carley V. Porter, Committee Chairman. (Assemblyman Porter was recently named National Conservation Legislator of the Year 1967 by the National Wildlife Federation. He had previously received the state legislator award for California.)

(Continued on page 4)

cc: State League - Minn.

LEAGUE OF WOMEN VOTERS
OF THE UNITED STATES
1200 17TH STREET, N. W., WASHINGTON, D. C. 20036

May 24, 1968

Mrs. Richard Phillips
6260 Comet Lane
Fridley, Minnesota 55421

Dear Mrs. Phillips:

Mrs. Clusen has asked me to tell you of her pleasure in reading that eight of the ten Leagues in the Rice Creek Watershed had decided to form an inter-League basin group. She is also pleased to note that the League of Women Voters of St. Paul, which is outside the basin but secures much of its water from the Rice Creek Watershed, intends to be a member of the group.

The rapid development in the basin and the interest of local officials from its 27 municipalities in the four counties in forming a watershed district are ample indication that there will be increasing need for the Leagues of the basin to work cooperatively.

The national Water Committee thinks the local Leagues involved were wise to decide to form this inter-League group before the situation is any further advanced. The Water Committee especially commends representatives at the April 9 meeting for their concern that both a cross section of local Leagues and Leagues of key importance, because of their location, participate in the group.

The decision to jointly study possibilities and proposals for managing the watershed is good. Experience in other basin groups has shown that fact gathering and committee discussion of the information must precede decisions on what to take to members, on a discussion outline for local League meetings and consensus questions. The key issues will become clearer as your committee works along. The need to reach consensus on broad aspects on areas and goals for basin management rather than specific legislation was another wise conclusion of the League representatives.

We know you will remain closely in touch with Mrs. Powers as the inter-League proceeds. You have the Guide to Leagues Requesting Permission to Act, so you know what information should be sent to the national Board when the group reaches the action period. I see that you are aware that no permission is needed to give information to your community.

I have no comments on the statements in the report headed "The Rice Creek Association of Fridley." The modifications suggested in the second last paragraph may or may not be good. I simply do not know enough about the situation to be able to give a responsible reaction. It is good for us in the national office to have the map of the watershed and the location of the Leagues involved.

As you see from the preceding paragraphs, the Rice Creek Watershed Inter-league Committee has national Board permission to organize, evaluate possibilities for water resource development and management for the Rice Creek, Minnesota watershed, and take subsequent action, based on the national Water Resources item. Please keep in touch with the national office and send us minutes of the inter-League meetings and copies of any materials you prepare. Since Mrs. Clusen is so close and has a particular interest in your area, you may want to send these things to her and have her send them on to the national office.

Our very best wishes for your success.

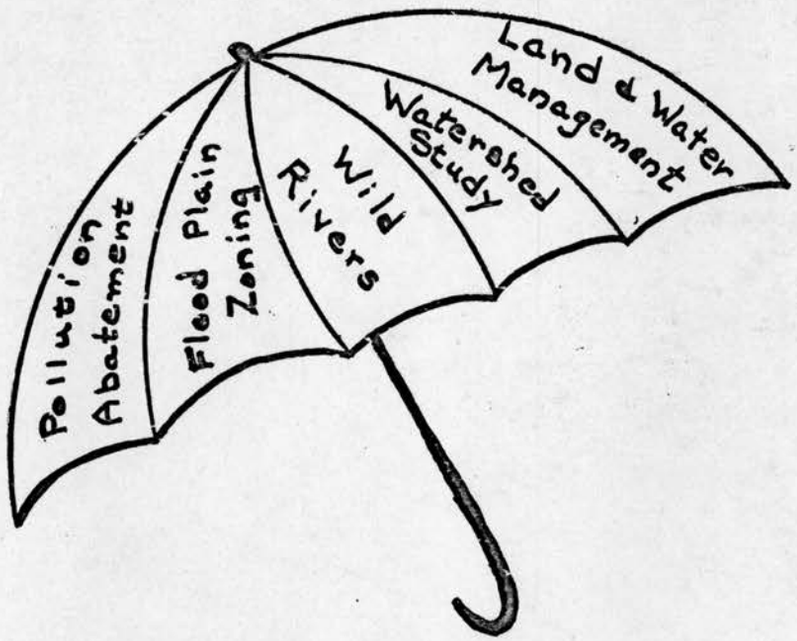
Sincerely yours,

Mrs. C.F.S. Sharpe
Program Specialist: Water Resources

ls/meo

c.c.: Mrs. Clusen
State League

League of Women Voters of Minnesota, 555 Wabasha, St. Paul, Minnesota 55101
May 1968



ACTION ON THE WATERFRONT

Many Leagues are not aware of the multitude of subjects that can be included under the water item. In addition to water, land use that affects quality and quantity of water falls within our position. There are three crucial steps which the local Board must take prior to action under the national position:

1. National Board permission must be obtained to act.
2. All Leagues that might be effected should be consulted and agreement should be reached.
3. Members should be informed, and they must support the action you propose to take.

Below is a list of some of the things that can be done but is by no means a complete list. If you have a question concerning water in your area, you should not hesitate to contact the state and national Boards for guidance.

1. Attend meetings. Attend Minnesota Pollution Control Agency, Corps of Engineers, Atomic Energy Commission and other hearings; federal-state enforcement conferences; and other meetings on water. Make an appearance and listen. Officials will get used to seeing the League and are glad to know that someone is interested. YOU DO NOT NEED NATIONAL PERMISSION TO ATTEND MEETINGS UNLESS YOU PLAN TO MAKE A STATEMENT.

2. Testifying. YOU MUST GET NATIONAL PERMISSION TO MAKE A STATEMENT. Statements should be in accord with national League position. The statement should not be a reiteration of the position, but rather specific information which the League may have from your work on water (Know Your Town surveys, local item studies, watershed studies, etc.) with reference to League study and agreement.

3. Local Leagues may support local legislation that implements or is similar to legislation which the League of Women Voters of the U.S. has supported on the national level and may support local legislation that implements a principle which agrees with the League's national position on water resources.

4. Support of appropriations for master plans on water and sewage.

5. Support of sewer bond issues and sewage treatment facilities bond issues.

6. Support of implementation of recommendations of federal-state enforcement conferences.

7. Support of implementation and enforcement of established water quality standards.

8. Support of official investigation of water pollution in a body of water -- its cause and cure.

9. Support of a watershed study.

10. Formation of inter-League groups to study and reach consensus on such matters as wild rivers, lake rehabilitation, pollution abatement, erosion control, and etc.

11. Support of efforts to upgrade the competence of treatment plant operators.

12. Support control of dredging, filling and dumping in the Great Lakes.

13. Support of efforts to zone for flood plain use.

PASS ON TO WATER CHAIRMAN

LWV of Minnesota

Sharpe

Editorials

Stillwater Protests

The Stillwater Gazette, when so inclined, can ink its pen in bitterness. Listen to this recent editorial:

"Somewhere just over the rainbow the wild river god has decreed that Stillwater shall have no voice in saying how the St. Croix river shall keep on rolling along. Neither shall Bayport, St. Croix Beach, or Afton . . .

"Somewhere just over the rainbow where the sun always shines the scenic river god has decreed that the St. Croix shall be a river for "all" the people to play in . . .

"And so the flood control god did not return. And the wild and scenic river rolled on as it pleased. And the distant and muffled sounds of cascading water were ignored by all."

The Gazette's wrath is stirred by the many area voices raised in favor of the wild river idea for the upper St. Croix and the widespread condemnation which the Army Engineers have received for even wanting to study the potential for flood control there. The Gazette accompanies its bitterly worded editorial with a full page of photos from the 1965 flood — photos showing the Stillwater bridge under water, cottages inundated, the 1,200 employe Andersen window plant at Bayport engulfed, Stillwater's main street closed to all cars and shoppers with sandbags piled high on top of sewers.

It is a fallacy, we think, to hold that communities along the bank should have the total voice in determining how a river is managed. This whole area has a stake in the St. Croix — the large expanse of recreational water below Stillwater and the lovely canoeing water above. But it's also unreasonable of wild river proponents to try to keep the Army Engineers, our flood control professionals, from even studying how the upper river could be managed to forestall flood damage on the St. Croix and Mississippi below.

Our view has been that Congress should safeguard the St. Croix's wilderness values for the time being by including it in the pending wild rivers bill. But that flood control studies should then go forward so that, in future decades, we'll have the most intelligent basis for deciding how the upper St. Croix should be used. We say this because there are some intelligent conservationists among us who fear that flood control may ultimately prove necessary to protect Lake Pepin. Under the ravages of repeated floods, this viewpoint holds, Pepin could gradually fill up with silt and turn from a lovely expanse of blue water into an unlovely acreage of mud flats.

FYI: More comments on the St. Croix
LS

Butler

PASS ON TO WATER CHAIRMAN

Conservation Report
NATIONAL WILDLIFE FEDERATION
1412 Sixteenth Street, Northwest Washington D. C. 20036
CONSERVE OUR NATURAL RESOURCES
DR. DONALD J. ZINN, President • THOMAS L. KIMBALL, Executive Director • LOUIS S. CLAPPER, Editor

This is one of the free services made possible by contributions received for Wildlife Conservation Stamps.

Report No. 23 Second Session 90th Congress JUN 17 1968 June 14, 1968

LS

HOUSE SUBCOMMITTEE CLEARS SCENIC RIVERS BILL FOR INTERIOR COMMITTEE

The Subcommittee on National Parks and Recreation, meeting in extended session this week, 6/12/68, ordered that a favorable report be directed to the full House Committee on Interior and Insular Affairs upon H.R.8416, providing for a national scenic rivers system (Report No. 9, page 59). As ordered reported, the bill contains many amendments.

The Senate already has passed S.119, establishing a similar system, by a 72 to 0 vote.

Among the many changes were several shifts in categories for streams.

Two rivers, the Wolf in Wisconsin and the Upper Saint Croix in Wisconsin and Minnesota, were added to the list of streams for immediate designation as components of the national scenic rivers system. Other rivers in this category are the Rogue in Oregon, the Rio Grande in New Mexico, the Salmon in Idaho, and the Clearwater in Idaho. All of these also are in the "immediate establishment" category of S.119. In taking its action, the House Subcommittee adopted the Senate descriptions for the Rogue, Rio Grande, Salmon, and Clearwater.

Several other streams, or portions thereof, were added to the "study" category: the Buffalo, Big South Fork of the Cumberland, and the Obed in Tennessee; the Little Miami in Ohio; the Clarion in Pennsylvania; the Middle Feather in California; the Missouri in Montana; and the Bruno, St. Joseph, Priest, and Moyie in Idaho. Removed from the study category were the Cacapon and Shenandoah in West Virginia, the Eleven Point in Arkansas and Missouri; the Guadalupe, Texas; and the Green, Wyoming. Remaining in the bill are: Chattanooga in North Carolina, South Carolina and Georgia; Delaware, Pennsylvania and New York; Flathead, Montana; Gasconade, Missouri; Illinois, Oregon; Klamath, California; Niobrara, Nebraska; Penobscot, Maine; Pere Marquette, Michigan; Pine Creek, Pennsylvania; Lower Saint Croix; Skagit, Washington; Susquehanna, New York and Pennsylvania; Suwannee, Georgia and Florida; and the Upper Iowa, Iowa.

The Subcommittee then began making up a scenic river bill.

RUSH FOR STRICT FIREARMS CONTROL HITS SNAG IN HOUSE

A rush to impose strict controls on the sale and distribution of firearms in the wake of Sen. Robert F. Kennedy's tragic assassination hit a snag in the House Committee on the Judiciary 6/11/68 after less than a week of frenzied activity

June 24, 1968

URSDAY'S RUN FOR ANTIQUE AUTOS

Sharpe

St. Croix Dam Plan Rejected

JUN 24 1968

Washington, D. C. –AP– A request by army engineers for funds to finance a study of a flood control dam on the St. Croix river near St. Croix Falls, Wis., has been rejected by the house appropriations committee.

Rep. Joseph Karth of Minnesota, who had been joined by Wisconsin congressmen in opposing the request, said the committee's decision indicated that the battle to protect the river was being won.

Karth said a poll of his constituents showed that more than 85% objected to the reservoir proposal.

Engineers had requested a $25,000 grant for a feasibility study of the proposal.

Congressmen and conservationists had said the reservoir would spoil sections of the St. Croix intended for preservation in a measure.

Karth
along the
d l e d wi
walls in
less area
constructi
$60 millic

Mar
To F

Madis
ant Majo
Martin (
nesday
date for
Wisconsi

Martin
cities of
and the

But this does not mean that the idea is dead forever.

15

LWV of Minnesota

PASS ON TO WATER CHAIRMAN

DEPARTMENT of the INTERIOR

news release

JUN 27 1968

WATER POLLUTION CONTROL ADMINISTRATION Pierce--962-4815

For Release June 27, 1968

MINNESOTA WATER QUALITY STANDARDS APPROVED

Standards proposed by Minnesota to improve the quality of its interstate and Great Lakes waters have, with some exceptions, been approved by Secretary of the Interior Stewart L. Udall.

This action raises to 38 the number of States and other jurisdictions whose standards have been approved by the Secretary in whole or in part.

The standards endorsed by Secretary Udall will protect waters used for swimming, fishing, boating and municipal and industrial supplies. In addition, these standards provide for upgrading water quality so that more waterways will be available for desirable uses.

The standards program is the first systematic nationwide strategy for water quality management. Emphasis of the program is to prevent pollution before it occurs rather than waiting to curb pollution after it has defiled a waterway.

Limits on such pollutants as bacteria, toxic materials and taste and odor producing substances in the water are set by the standards. A key part of the standards package submitted by each of the States is a plan showing how these standards are to be achieved and enforced, including schedules for construction of treatment facilities by cities and industries.

In his approval letter to Governor Harold E. LeVander, Secretary Udall wrote that "I am gratified by the generally good standards and high treatment requirements adopted by Minnesota."

The Secretary said that he is excepting at this time certain dissolved oxygen and temperature standards as being too lenient.

He also said that standards had not been provided for the St. Louis River and urged Minnesota to establish standards for this river as soon as possible.

Tightening of a number of standards' criteria to provide better protection of recreation and fishing waters was recommended by Secretary Udall. The Secretary also asked for more specific information on the plans of polluters for providing appropriate treatment of their discharges.

The Secretary asked Minnesota to adopt a formal policy to protect existing high quality waters, the same request he has made of a number of other States.

The position of the Department of the Interior on guarding high quality waters is that such waters "will not be lowered in quality unless and until it has been affirmatively demonstrated to the State water pollution control agency and the Department of the Interior that such change is justifiable as a result of economic and social development . . . ."

The proposed development would not be permitted if it interfered with any desirable uses made, or presently possible, in these waters, Udall wrote.

Adoption by a State of such a policy should require "any industrial, public or private project or development which would constitute a new source of pollution or increased source of pollution of high quality waters . . . as part of the initial project design, to provide the highest and best degree of waste treatment available under existing technology . . ."

The other jurisdictions whose standards have now been approved in whole or in part are:

Georgia, Oregon, New York, North Dakota, South Dakota, Arkansas, Idaho, Massachusetts, Maryland, Indiana, Washington, Wisconsin, Texas, Michigan, Illinois, Rhode Island, Missouri, Louisiana, Alabama, Connecticut, Alaska, Montana, Oklahoma, Tennessee, Ohio, Delaware, New Jersey, Hawaii, North Carolina, Mississippi, Pennsylvania, the Territory of the Virgin Islands, the Delaware River Basin Commission, the District of Columbia, West Virginia, Maine, and Guam.

The Department of the Interior's Federal Water Pollution Control Administration is now discussing with the other States strengthening of their standards so that they can also be approved by Secretary Udall.

# # #

6413-68

WETLANDS PROGRAM TO END JUNE 30, 1968

Congressman John Dingell of Michigan introduced H.R. 480 in January 1967 to extend the small wetlands program of the Bureau of Sport Fisheries and Wildlife for another eight years beyond June 30, 1968. The present program was provided for by the enactment of Public Law 87-383 on October 14, 1961. It authorized an advance of up to $105 million in the seven years beginning with fiscal 1962 and ending with fiscal 1968 for the acquisition of 2.5 million acres of waterfowl habitat nationwide. The advance is to be repaid with receipts from the sale of duck stamps.

By the end of this fiscal year, on June 30, 1967, the total is estimated at 927,300 acres acquired at a cost of $65 million, $38.5 million from the advance and $26.5 million from duck stamp receipts. At this rate the program will end with less than half of the wetlands goal acquired.

Other bills identical to H.R. 480 are H.R. 4216 by Representative Silvio O. Conte of Massachusetts and S. 1078 by Senators Lee Metcalf of Montana and Gaylord Nelson of Wisconsin, thus giving bipartisan support. Both House bills were referred to the House Committee on Merchant Marine and Fisheries chaired by Edward Garmatz of Maryland. The Senate bill was referred to the Senate Commerce Committee chaired by Warren Magnuson of the State of Washington.

Identical bills introduced last year to extend the program were not reported out of Committees.

Water

Wetlands Program for Wildlife Conservation
Region III, Bureau of Sport Fisheries & Wildlife, U. S. Fish & Wildlife Service

Natural wetlands support more wildlife per acre than any other land type in the north central United States. This is the area in Region III of the Bureau of Sport Fisheries and Wildlife. Wetlands are marshes, swamps, potholes, sloughs, swales, depressions, and shallow lakes and ponds which may have surface water for only a few days annually or the year around.

Studies by the Bureau have shown the significant value of wetlands, large and small, permanent and temporary, in producing migratory waterfowl. The Congress of the United States has recognized this value especially for waterfowl production. It has further recognized that artificial drainage and other works of man often destroy the capacity of wetlands to serve the needs of waterfowl.

The Congress enacted laws to save waterfowl habitat so the people of the United States may continue to enjoy the many forms of recreation dependent on waterfowl. The Bureau of Sport Fisheries and Wildlife is assigned the responsibility to do wetland conservation work required by those laws.

The Bureau is using funds from the sale of duck stamps and from a $105,000,000 Congressional loan to buy refuges and wetland areas and to purchase easements to preserve wetlands from burning, draining, and filling. A large share of these funds will be used in Region III where 1,750,000 acres of small wetlands are scheduled to be protected by purchase or easement. Since 1960 the Bureau has purchased about 150,000 acres and obtained easements on about 450,000 acres of small wetlands in Region III.

Most of the small wetlands important to waterfowl in Region III are in Minnesota, North Dakota, South Dakota, and Nebraska. These are the "Prairie Pothole States." The pothole wetlands are so important for waterfowl production that Congress enacted a law in 1962 which restricts the use of Department of Agriculture funds for drainage assistance. This law provides time for the Bureau to inspect the wetlands proposed for drainage to determine if wildlife habitat will be harmed if the areas are drained and, if so, to recommend preservation of the wetlands. Since October 2, 1962, the Bureau has inspected over 75,000 individual wetland areas proposed for drainage and found that over 50,000 of these should be preserved because of their high value to wildlife.

The wetlands preservation work in the "Prairie Pothole States"--inspection of areas proposed for drainage and obtaining purchase or easement--is done by eight Area Acquisition Offices assisted by the Regional Office. These offices are staffed with appraisers, biologists, clerical personnel and, in some cases, engineering survey crews. The future production of millions of waterfowl will depend on the success of these efforts. The success of these efforts depends on public support. You can help by speaking and writing to officials to support wildlife conservation done by the Bureau of Sport Fisheries and Wildlife.

WETLANDS ARE WILDLIFE LANDS

555 Wabasha
St. Paul, Minnesota 55101
June 11, 1968

The Honorable Odin Langen
House Office Building
Washington, D.C. 20515

Dear Congressman Langen:

We are writing this letter to you urging you to support the $225 million of federal funds for incentive grants to localities for sewage treatment facility construction in fiscal 1969.

The Clean Water Restoration Act of 1966 authorized $700 million for FY 1969; however, we can appreciate the difficult task facing the Congress because of the general financial situation in the UnitedStates. For this reason we are not asking for the full amount authorized. We are asking that the amount of the President's budget request be maintained. By attending the various hearings conducted by the Minnesota Pollution Control Agency and the Federal-State Progress Evaluation Meeting held in Minneapolis in April, we have become aware of the need to construct or improve waste treatment facilities in many communities in Minnesota. Not only is there a need, but we have been made acutely aware that these are very expensive projects and that these communities cannot finance them alone. We know that other states will be competing for these funds and that Minnesota's share will not begin to fulfill our need, but it will be a continuance of what we have begun.

Thank you for your consideration.

Yours very truly,

Mrs. O. J. Janski
President

cc: Janski
Ebbott
Office
Powers

Mrs. Leland Powers
Water Resources Chairman

LEAGUE OF WOMEN VOTERS
OF THE UNITED STATES
1200 17TH STREET, N. W., WASHINGTON, D. C. 20036

August 9, 1968

Mrs. Harold Watson
First Vice President
League of Women Voters of
Minnesota
555 Wabasha
St. Paul, Minn. 55101

COPY

Dear Mrs. Watson:

The enclosed clipping from the Red Wing (Minn.) Daily Republican-Eagle reminds me that the League might want to propose that all the organizations in Minnesota support state matching funds for sewage facility construction under the program provided in the Clean Water Restoration Act. The League interest and support of such state funding is described on p.45 of the May 1968 NATIONAL BOARD REPORT and on p.85 of the January 1968 NBR.

Sincerely yours,

ls/meo
enclosure

Mrs. C.F.S. Sharpe
Program Specialist
Water Resources

c.c.: Mrs. Clusen
Minn. LWV

CF LETTER

a report on environmental issues from
THE CONSERVATION FOUNDATION

September 27, 1968 11-68

* *

* *In this issue: The nation's staggering problem of trash disposal . . . Congress moves, cautiously, to solve it . . . Some new techniques for handling wastes . . . And the aftermath of the controversial highway bill.* *

* *

OUR MOUNTING ACCUMULATION OF SOLID WASTES POSES ANOTHER THREAT TO THE ENVIRONMENT

Every day, each American throws off an average of about five pounds of garbage, rubbish and junk. Inevitably, some of this total of 500,000 tons per day accumulates -- car hulks rusting along a country road, trash piled up in a vacant ghetto lot. Most of it we burn or bury, putting it out of mind as best we can.

But the wastes keep mounting. And the fear increases that, despite our often half-hearted efforts at disposal, we may eventually choke on it all.

Says Dr. Philip R. Lee, an Assistant Secretary of Health, Education and Welfare: "We have been running to keep pace with the growth of the solid waste problem, and we are losing the race." (1) Similarly, Dr. Ross E. McKinney, of the University of Kansas, has warned: "We have already allowed the problem to exceed the solution." (2)

In any case, the nation's solid wastes clearly pose a major threat to the environment. As Congress has noted, they "result in scenic blights, create serious hazards to the public health, including pollution of air and water resources, accident hazards, and increase in rodent and insect vectors of disease, have an adverse effect on land values, create public nuisances, otherwise interfere with community life and development." (3)

What do we do with all the worn automobile tires, old mattresses, steak bones, orange peels, broken glass, boxes, cans, discarded refrigerators, rags, dead animals, broken furniture, bottles, demolition rubble, sewage sludge, and paper and more paper?

Civilization has come a long way from the time when the simple "out-the-window" method of disposal was prevalent, and even from the more recent years when urban waste consisted largely of some garbage and ashes. Even with much garbage now dissipated in kitchen disposal units, and with ashes reduced by the shift from coal to natural gas and oil, other factors have caused the waste problem to mushroom:

Population has not only increased, but become highly concentrated. Exploding technology and mass production have led to rapid, even planned obsolescence.

The Conservation Foundation 1250 Connecticut Avenue, N.W., Washington, D.C. 20036 | phone (202) 659-2180

Russell E. Train, President **Marvin Zeldin,** Director of Information Services **Rice Odell,** Assistant Director

Affluent consumers gobble up new products. If their older models need repairs, it is easier, if not cheaper, to discard them with abandon. Technology also provides new, disposable packaging methods for a society which demands more and more convenience (and which also has a fetish for cleanliness). There are easy-to-handle plastic containers which are impervious to weather or bacterial destruction; rust-proof aluminum cans to replace tin cans; and countless immortal bottles, most of them no longer returnable for reuse, but tossed out along with everything else. Add to this the amazing proliferation of paper and pulp products, for reading, wrapping and even wearing.

All these factors not only produce important changes in the mix of today's wastes, but create a volume estimated to be rising at an annual rate of 4% -- half due to the population increase and half due to increasing per capita consumption.

This is an immense challenge to technology and management. The solution is all the more difficult because, as Professor Percy H. McGauhey, of the University of California at Berkeley, has said, "our heritage of wastefulness is derived from an economy which now demands that the volume of waste be constantly increased in order that the economy itself be maintained." (2)

It is also more difficult because of public apathy. The public doesn't want to be bothered with such seemingly mundane problems. It isn't often that a dramatic or tragic event punctuates the day-to-day routine of waste disposal, jarring the public to action. Such an event occurred last February, at Washington, D.C.'s Kenilworth Dump, where a 7-year-old boy burned to death while playing near some smoldering garbage. And in October, 1966, when a huge coal slag heap suddenly slid down to the town of Aberfan, Wales, killing 144, most of them school children. And in New York, also last February, when a strike of sanitation men left the city's streets clogged with uncollected garbage, raising a frightening specter of epidemic.

Rather, the accumulation of wastes is a more insidious process, like a community cancer, which seems to keep spreading despite continuous treatment by incineration, dumping and burial.

Paying The Price of Profligacy

The public and its politicians might sit up and notice the solid waste problem more if they had a better notion of its direct and indirect costs. The disposal of municipal wastes alone, according to Carl Rampacek, of the U.S. Bureau of Mines, costs about $3.5 billion a year. This "ranks third in municipal expenditures, exceeded only by the costs of education and highway construction." (4)

This is a per capita annual cost of some $17.50. Handling solid wastes in some communities takes 10 cents out of every tax dollar; New York City's Department of Sanitation has a 1968 operating budget of $139 million. Perhaps not atypical are the collection charges paid directly to their county by residents of several Washington, D. C. suburbs -- $46.20 per year per dwelling unit. On top of that, about $4.40 in general tax revenues is spent for disposal, for a total per household of $50.60 a year.

Perhaps there is no greater tribute to the lucrativeness of the garbage collection business than the long-time involvement of the Mafia. On June 28, 1967, U.S. Attorney Robert M. Morgenthau reported that a two-year investigation showed that 90% of the commercial waste disposal in Westchester County,

ON THE DEFENSIVE

"Any material becomes a 'waste' when its owner or producer no longer considers it of sufficient value to retain. Any suggestion that he should thereafter invest more money in it, for the sake of disposal or any other financially unrewarding goal, is likely to be considered absurd . . . Ensnared in this public economic spirit, engineers and officials responsible for wastes management in the community have . . . in general, apologized for the fact that their systems cost anything at all, often retreating from expedient to expedient on the basis of cost in dollars instead of leading the public to understand that wastes management is worth whatever it costs within the framework of honest engineering and sound public health practice; and that the cost is the price man must pay for the benefits of a modern urban-industrial-agricultural society."

-- Professor Percy H. McGauhey, University of California, at House Interstate and Foreign Commerce subcommittee hearing, June 29, 1965.

New York, was handled by companies controlled by two Mafia "families." (5) A large department store there pays as much as $1,500 a month for private collection.

Just as important to the citizen are the indirect costs of solid waste disposal. Wastes are often dumped on land or wetland of great value for other purposes. It is estimated that a population of 1,000 requires up to one acre foot per year for dumping and filling. Land is being rapidly eaten up. (Of course, losses are often offset by using wastes to reclaim otherwise unused areas. For example, much of the Chicago lakefront is filled land.)

But as cities gradually run out of space, they turn hungrily to inexpensive areas such as estuaries, marshes, shorelines and stream valleys. CF President Russell E. Train has warned against the "destruction or contamination by dumping and landfill activities of natural environments and natural resources which have . . . high values for educational and recreational uses, or have irreplaceable historic or scientific values." (6)

(Few products of civilization consume more space than our dead bodies, preserved in caskets and monuments. "Indeed," said Newsweek on September 16, 1968, "the International Cremation Congress . . . estimates that if all the people who died in Britain last year were next to one another, the country would have lost land covering some 605 soccer fields." And it quotes Ralph Moehler, superintendent of Boston's Gethsemane Cemetery: "Twenty-five years from now there's going to be no more room for burials in Boston. It's something people just don't want to face." Meanwhile, thousands of bodies are being exhumed in cities so the scarce land can be used for other purposes.)

Industry also spends huge amounts for waste disposal, and these costs are naturally reflected in the prices of goods to the public. A cost appraisal might also take into account the value of natural resources and other materials which are destroyed rather than reused -- in addition to the various health and nuisance detriments of wastes to the environment.

A Reliance on "Crude Techniques"

In 1901, an engineer wrote: "In no branch of municipal service has so little progress been made in the U.S. as in the disposal of garbage." (7) Today, the techniques of waste disposal are still fearfully outmoded. They "represent little advancement beyond the technology of the garbage pail, the trash can, the open dump, and the obsolete incinerator," said Wesley W. Gilbertson, Pennsylvania's director of environmental health. (8) Lee calls them the "crude techniques we have relied on to deal with a problem of soaring size and complexity." (1) And McKinney concurs: "We have covered our refuse trucks to prevent the escape of excessive odors to the environment and we have learned to compress the refuse in our trucks, but that is all." (9)

Apart from such minor improvements in the ways we handle wastes, American cities rely chiefly on two classical methods for disposing of it:

* Dumps and sanitary landfills. The sanitary landfill is an important refinement of the open dump where trash is haphazardly piled up and burned, with all its attendant dangers and nuisances. In a landfill, wastes are laid down evenly or in trenches, then covered over each day with a blanket of soil. Properly operated, this is clean, causing little or no air pollution or health hazard; however, lack of careful location, design or operation can result in pollution, particularly water pollution, through seepage and drainage.

Landfills are also relatively inexpensive, with operating costs usually ranging from $2 to $5 per ton for a small fill and 75 cents to $2.50 per ton for a large one. Of course, landfills use up precious land, but more and more often are being contoured for parks, golf courses and the like.

* Incineration. Of course, the main benefit from incineration of wastes is the reduction of volume. However, the residue of 20% or more must still be disposed of. Incineration is considerably more expensive than landfilling, usually running $7 or more per ton. It also requires a large capital investment. And it is a major contributor to air pollution.

There is often a vicious circle in waste disposal systems. In 1967, New York,

* * * * * * * * * * * * * * * * * * * *

* SPECIAL EFFECTS IN THE GHETTO *

* *"It must be concluded that slum sanitation is a serious problem in the minds of the urban poor . . . The point is . . . the peculiarly intense needs of ghetto areas for sanitation services. This high demand is the product of numerous factors, including: higher population density; lack of well-managed buildings and adequate garbage services provided by landlords, number of receptacles, carrying to curbside, number of electric garbage disposals; high relocation rates of tenants and businesses, producing heavy volume of bulk refuse left on streets and in buildings; different uses of the streets -- as outdoor living rooms in summer, recreation areas -- producing high visibility and sensitivity to garbage problems; large numbers of abandoned cars; severe rodent and pest problems; traffic congestion blocking garbage collection . . ."* *

* *-- Report of the National Advisory Commission on Civil Disorders, March 1, 1968.* *

* * * * * * * * * * * * * * * * * * * *

plagued by air pollution, passed an ordinance requiring large apartment buildings to clean up their 4,000 incinerators. Many of the owners balked, saying they'd rather put their trash out in cans and let the city take care of it. The already beleaguered Sanitation Department objected that it had neither adequate facilities nor disposal sites. The additional volume seemed destined for the edges of the Pelham Bay estuary on Long Island Sound. This brought a cry from the city park commissioner and conservationists, who argued that the area is a wildlife and fish sanctuary and one of the few remaining unspoiled shorelines in the region.

It has been estimated that New York will run out of landfill space altogether in four to eight years. Philadelphia has been short of space for decades, and consequently incinerates 90% of its wastes. Other cities are leaning toward bigger and better incinerators -- but often with elaborate air pollution control devices required by regulatory officials. Says Richard D. Vaughan, director of the Public Health Service's Solid Waste Division:

"Some cities have received rather shocking news lately when construction bids have been opened on (such) incinerators . . . The capital investment and operation unit costs represent a one-third to one-half increase . . ." (10)

There's also more to the solid waste dilemma than the 185 million tons of municipal wastes generated each year. Industrial wastes are measured in the many hundreds of millions of tons annually -- waste rock, mill tailings, slag, ash, processing residue and the like. Many materials, of course, are salvaged and reused, but much remains to be dealt with. (Special problems are posed by atomic wastes, and even by the "garbage" now orbiting throughout space.)

Add more than a billion tons of agricultural wastes each year -- including logging debris, field crop residue, animal manure and carcasses. Discussing the 700 million tons or so of animal wastes produced each year, Agriculture Secretary Orville Freeman said: "The disposal facilities to cope with the staggering amount of animal wastes from highly concentrated feeding operations (feedlots) just don't exist." (11) This is a "largely unrecognized problem," said the April, 1968 issue of Missouri Conservationist, which added:

"Missouri has about as many pigs and cattle as people -- four million. Yet the animals produce sewage equal to that produced by 40 million people! . . . It's clear that any efforts to clean up our own wastes will be largely cancelled by an army of well-fed farm animals."

Why is all this manure not used for fertilizer? Chiefly because it's too expensive to handle and transport. Farmers prefer their fertilizer out of a bag -- cheap, concentrated and easy to distribute.

# # #

CONGRESS ACTS, CAUTIOUSLY

In spite of all these complex and compound waste problems, and in spite of the limitations of the nation's disposal systems, until three years ago there was scant official concern with waste management and control. "In 1965, only two states had identifiable solid waste programs . . . The total expenditure (for research) by the Public Health Service during fiscal year 1964 was about $430,000 . . . The problem of solid waste disposal was one of the neglected areas of pollution control." (1)

The first federal legislation dealing with the problem, in 1965, was the serendipitous result of increasing concern over air pollution. While drawing

up the Clean Air Act Amendments that year, Congress came to realize that burning in open dumps and incinerators was causing much of the air pollution. Almost as an afterthought -- and prodded by Senator Edmund S. Muskie of Maine, chairman of the Senate Public Works subcommittee involved -- Congress added a section which became the Solid Waste Disposal Act of 1965. Signed into law by the President on October 20, 1965, the Act has two basic thrusts:

* "To initiate and accelerate a national research and development program for new and improved methods of proper and economic solid waste disposal, including studies directed toward the conservation of natural resources by reducing the amount of waste and unsalvageable materials and by recovery and utilization of potential resources in solid wastes."

The Act authorizes the Secretary of Health, Education and Welfare (through the Public Health Service) to make grants-in-aid for research and demonstration projects. The same authority is vested in the Secretary of the Interior (through the Bureau of Mines) when the waste problem is tied to the "extraction, processing or utilization of minerals or fossil fuels."

* "To provide technical and financial assistance to . . . agencies in the planning, development and conduct of solid waste disposal programs." Thus the Secretary may make grants to state and interstate agencies of up to 50% of the cost of surveys of waste disposal practices and problems, and the development of plans for their jurisdictional areas.

The Act authorized funds for four years (fiscal 1966 through 1969) -- a total of $92.5 million for HEW and Interior. Actual appropriations for that period will total only $60.9 million, even in the unlikely event that Congress doesn't cut Interior's $17.5 million request for fiscal 1969.

On April 27, 1967, Muskie took note of the new research projects and surveys underway, and the new insights being gained in ways to deal with the "residue of our prosperity." He said: "We need now to put this information to work on an operational basis." (12)

Muskie thus introduced a bill (S. 1646) to amend the Solid Waste Disposal Act and authorize a massive federal grant program to aid communities in the construction of solid waste disposal facilities. The bill would provide authorizations for five years, starting at $56.8 million for the first year and rising to $257.5 million in the fifth year.

Grants would not be approved unless a project is consistent with a state or interstate solid waste plan, and is included in a satisfactory comprehensive plan for the area involved. Grants would provide up to two-thirds the cost of a project serving a single municipality, and up to three-fourths the cost of a project serving an area with more than one municipality. (The bill would also beef up the federal aid for planning grants to the same percentages.)

"We are approaching a solid waste disposal crisis," Muskie said, "but we still have an opportunity to avert it." He said that in the next decade the nation will need $250 million for additional facilities just to keep pace with anticipated disposal needs, and that few states have the financial resources to put their plans into operation.

No action was taken on S. 1646 in 1967, and this year the Administration decided it was not ready to go ahead with a large construction grant program until it knew more about the waste problem. Instead, President Johnson recommended a one-year extension of the 1965 Act. (Congress is soon expected

WHAT GOES IN MUST COME OUT

"It is not readily realized that essentially everything that is brought into a city must sooner or later be taken out. Even the material out of which you make the buildings goes out as demolition waste . . . When I stand at Princeton and watch full box cars going toward New York and empty box cars coming back, I have a strong feeling of concern as to where all that other stuff -- the waste stuff -- is going to go."

-- Dr. John Tukey, professor of mathematics at Princeton University, in "Research Needs in Environmental Health," NAS-NRC Publication 1419, 1967.

to approve the extension, as provided in S. 3201.) At the same time, the President called for a "comprehensive review of current solid waste disposal technology," to be undertaken by the Office of Science and Technology. (13)

This review is under the direction of Dr. Rolf Eliassen, professor of environmental engineering at Stanford University, who is working with federal agency experts. It has the dual purpose of seeking ways to lower the high costs of waste disposal, and to strengthen the federal role in research and development. It is expected to be completed before the end of the year and to help provide the basis for legislative recommendations next year by the new administration or Congress.

Congress concurred in the delay, withholding hearings on S. 1646 to await the OST study. (S. 1646 can be reintroduced next year, of course.) The Senate Public Works Committee said more knowledge is needed because "capital resources must be invested wisely, not wasted on false starts that in the long run may lead to dead end approaches." (1) It also took note of a report prepared by the Library of Congress for Senator J. Caleb Boggs of Delaware, which reached this pointed conclusion:

"It is now evident that the industrial economy of the United States . . . must undergo a shift from a use-and-discard approach to a closed cycle of use and salvage, reprocess and reuse. The timing of the conversion need not be precise; it is likely to go on for a century or more; it may never be total. But it must occur, or else man faces the alternative of a congested planet that has turned into a polluted trash heap, devoid of plant and animal life, depleted of minerals, with a climate intolerable to man." (14)

The argument against congressional delay was expressed by Ron M. Linton, an environmental management expert who was Committee staff director when an early attempt to include incinerator construction grants in the 1965 Act met with failure. "The Department (HEW) convinced the chairman of the subcommittee handling the bill that they needed to spend several years in research before investing substantial amounts of moneys in incinerators that would become outdated. I think it has become apparent now in the Department that by the time they reach the point of developing their research, the facilities that would have been built would have outlived their economic usefulness anyway. The result now is that we have neither . . . I think there is too much of a tendency to wait until we have perfect answers before we act." (10)

# # #

THE EAGER QUEST FOR SOME TECHNOLOGICAL BREAKTHROUGHS

What does the future hold? What are the prospects for major breakthroughs in our sluggish, outmoded strategy for dealing with the growing solid waste problem?

Technology and enterprising management can doubtless find most of the solutions. But they are linked to the problems of time, of cost, and of overcoming public indifference. Current research and demonstration projects are almost endless in their variety -- from the simple dumping of old auto hulks into coastal waters to provide a "reef" habitat for fishes, to the perfection of an intricate chemical process to isolate valuable minerals from waste. They also vary in their prospects for success. These are some of the noteworthy areas of investigation:

* Philadelphia has contracted with the Eastern Land Reclamation Co. to remove from the city hundreds of thousands of tons of waste a year. The company will construct two transfer stations to receive the wastes. Huge machines will shred and bale them, and they'll be loaded into empty freight cars of the Reading Railroad, then hauled for dumping in the state's gouged strip mines. The "garbage express" is scheduled to start running next spring. The city will pay the company $5.39 per ton, compared with its present cost of about $7.50 a ton for incineration.

At the same time the American Public Works Association, under a three-year grant from PHS, is investigating and will demonstrate a rail-haul solid waste system in conjunction with the New York Central Railroad. In addition, the Maryland State Department of Health has a three-year grant for an in-depth study of the feasibility of using abandoned strip mines for landfills. It is operating a model in Frostburg.

Such management techniques hold promise, not only for reducing municipal disposal costs, but aiding railroads and filling in unsightly strip mines. Not only can topography often be improved with imaginative use of fill; islands can be built for recreation or wildfowl habitat; and some localities are piling up their trash until they have a good-sized hill, which they cover and use for skiing, tobogganing and the like. Projects in various stages are in Virginia Beach, Va., and Cook County and Du Page County, Ill. The latter plans a 118-foot hill and a 65-acre lake, all built on fill.

* Improved incinerators are being studied. An example, also under a PHS grant, is an ultra high temperature plant being evaluated by the city of Brockton, Mass. PHS says it allegedly has these advantages: low capital and operating costs; flexibility in size and types of waste it can handle; and operation at such a high temperature that it not only reduces the need for air pollution control devices, but produces an inoffensive residue which can be used widely in many community operations in lieu of gravel. (10)

Much work is also being done to utilize the heat from incinerator operations. A number of European cities, for example, successfully capture such heat in the form of steam, and use it for generating electricity or heating buildings. Paris sells enough garbage power to recover about one-third of its incineration costs. "The special problems of West Berlin have caused that city to build what is probably the most thoroughly integrated of all incinerator plants," says Earl T. Hayes, deputy director of the Bureau of Mines. "The furnace unit is adjacent to a power plant that utilizes steam provided by

the incinerator boilers . . . Metal is reclaimed from the residues and the nonmetallics are sintered into aggregate for concrete block." (4)

Although there are economic and political obstacles in the U.S. that don't exist in Europe (such as lack of cooperation between private utilities and municipalities), several cities already use incineration heat for other purposes and more such facilities are planned.

* Many experts have concluded that the only genuine, long-term answer lies in reclaiming and reusing most of our materials -- a process perfected by nature. "Unquestionably, recycling should be the ultimate objective in our planning," says Dr. Ivan L. Bennett, Jr., deputy director of OST. "Many examples of economical conversion of wastes into marketable products exist and some of these have been highly profitable ventures." (6) (Witness to this is the huge size of the nation's materials salvage industry.) But, says Bennett, it doesn't make a large enough dent in the total accumulation.

Bennett recommends that "in the design of new products and processes, we should give as much consideration to eventual disposal or dispersion as is now given to consumer utilization." Perhaps a case in point is Clemson University professor Samuel F. Hulbert, who is working on a self-disposable bottle. Though made with the same basic elements as glass, he says, when it breaks it will become soft, greasy and melt away. (15)

Unfortunately, current economic trends (as well as the American public's devotion to convenience) militate against greater recycling. Labor and transportation costs are rising, as is the use of synthetic materials. Rare is the peddler who stops to separate newspapers or rags from today's trash. Or the schoolboy glad to return empty bottles for a few cents. (Industry says a soft drink bottle used to make an average 24 round-trips. Now people even throw away the returnable bottles.)

Many junked autos are reprocessed, but not if they're located an economically inconvenient distance from the monstrous new compacters or shredders.

We Might Want Them Back

There is another reason for recycling: "These very commodities we are throwing away today may (some day) be in seriously short supply," says Dr. Walter R. Hibbard, director of the Bureau of Mines. (10) He notes, for example, that we are importing 85% of our aluminum ore, bauxite, and 40% of our iron ore -- both ingredients of incinerator residue.

"For each ton of refuse incinerated," Hibbard says, "about 20 pounds of fly ash is generated and this contains gold and silver . . . We have found enough values in the fly ash from incinerators to be comparable to the assay of gold and silver in a normal mine out in the West."

Arsen J. Darnay, Jr., of Midwest Research Institute, Kansas City, states that by the turn of the century, according to some observers, "our demand for paper is expected to outstrip our capacity to produce pulpwood." He adds that "each ton of recycled wastepaper saves 17 pulp trees." (10)

The report to Senator Boggs raises the specter of nations around the world, encouraged by the U.S. to industrialize, and then competing with her for essential minerals. "Nations now supplying minerals to this country are in a position to trade minerals for food, and under conditions of world food shortage might be obliged to confront the United States with an awkward

choice between a domestic minerals shortage and a domestic food shortage." (14)

Dr. Athelstan Spilhaus, president of the Franklin Institute in Philadelphia, suggests that we "bank" potentially valuable wastes until we know how to get at their ingredients economically. For example, pile up a "mountain of junked automobiles somewhere in the flat land which we could use for skiing on in the meantime and mine when our high grade iron ore gives out. And this is not a joke. In Johannesburg, South Africa, when they first mined gold, they dumped the waste right next to the mine shaft, building great slag dumps. Then when the cyanide process came along they used them. There was enough gold left in those dumps so it was worth reprocessing them. Years and years later they found there was some uranium in the dumps and they processed them a third time." (16)

Other Efforts To Solve The Problem

Numerous other attempts are being made to deal with man's wastes:

* Tezuka Kosan Co. of Tokyo developed a giant compacter said to reduce trash to 10% of its original volume. Chicago recently purchased one for trial. It uses 3,000 tons of hydraulic pressure, and the resulting hard blocks, it is said, can be used for construction work.

* Composting is a venerable method of treating municipal wastes by accelerating their bacterial decomposition and using them as soil conditioners. Its economic success in this country has been severely limited, however, and now it is argued that composting should be considered a waste treatment process, and not judged a failure just because there's little market for the final product. (17) "Soil scientists agree that heavily farmed land should have some sort of organic humus added periodically," said the October, 1967 issue of Fortune. "Now it is being suggested that the city should pay the cost of making the compost and perhaps even of plowing it into the farmers' land and be thankful that it has a place to put its refuse." In any case, the PHS and Tennessee Valley Authority are cosponsoring an elaborate composting project at Johnson City, Tenn. (18)

* Some cities might find relief by dumping more wastes into the deep ocean. New York currently removes sewage sludge and other residues by barge and dumps them at sea. It used to do the same with regular municipal refuse, but pieces kept floating up on New Jersey's beaches and in 1933 the U.S. Supreme Court put a stop to the practice. (19) The Department of Industrial Hygiene at Harvard University is working on designs for an "incinerator ship" which would burn wastes at sea and toss in the residue.

* Various economic and legislative restrictions have been proposed. Spilhaus and others have recommended that some sort of disposal fee be imposed on homes and industries according to the wastes they generate. They note that effluent charges are applied to sewer discharges. This might boost efforts to lessen waste and recycle valuable materials. (20) "If the cost of ultimate disposal were partly shifted back to the producer initially responsible . . . economic pressures would be generated toward solution of the problem." (14)

Also suggested is a tax or price incentive to get rid of junk cars. Laws against non-returnable bottles were introduced in 21 state legislatures last year alone. They were triggered by anti-litter forces rather than those concerned with volume solid waste reduction. All were unsuccessful.

Since collection and transportation of wastes usually eat up 75% to 85% of total disposal expenditures (chiefly due to labor costs), this appears to be a ripe area for research. Among the possible answers are on-site or mobile incinerators, and more effective compacting trucks. Professor Iraj Zandi, of

* * * * * * * * * * * * * * * * * * * *

A "NORMAL" COST

"In our free enterprise economy, acceptable disposal of wastes should rightfully be a normal part of doing business. Any additional costs involved should be treated as operating costs -- costs which the consumer must be prepared to share. I doubt if those costs will ultimately be great."

-- Vice President Hubert Humphrey, interviewed by Nation's Business, September, 1968.

* * * * * * * * * * * * * * * * * * * *

the University of Pennsylvania, is working on an elaborate system for grinding up all wastes on-site, mixing them with a little water, and piping them out of town as slurry.

"The universal use of garbage grinders should be considered," says a new study of the New York region. (21) "Although garbage is only about 10% of residential solid wastes, it is the portion most attractive to insects and rodents . . . (This) would permit less frequent waste collection." It said once-a-week instead of twice-a-week collection in a city could reduce costs up to 35%.

The Benefits of Cooperation

There could also be great savings in collection if more antiquated jurisdictional and political lines were crossed. "Cities," says Vaughan, "may be part of a metropolitan complex with 10 or 15 other communities, none of which has the real financial ability to handle this alone, but they have a reluctance to work together." (10) Not so in Los Angeles County, however, where 70 municipalities share transfer stations, landfill sites and other economies of scale, with the result that for the city of Los Angeles the average disposal cost is only about $12 per ton -- compared to $30 in New York.

Train recommends another area of cooperation -- suggesting that any federal aid for solid waste programs be contingent upon full state and local government consideration of environmental resources and values. (6) New York City last March officially recognized the interrelationships of all its air, water and solid waste pollution functions and consolidated them under an Environmental Protection Administration. And two months ago, Pennsylvania Governor Raymond Shafer signed the first state law permitting a comprehensive waste management program in cooperation with local governments, with grants for planning and Health Department regulation of disposal systems.

McKinney notes, however, that we may fail even with adequate legislation and funding: "There simply will not be enough people adequately trained in solving solid waste problems to meet the demand." (9)

In sum, government, industry and the public are just beginning to realize the full significance of the solid waste problem. But time is working against them -- time and the nation's great proclivity for churning out wastes. If the experts are to be heeded at all, everyone concerned had better get on with the job.

# # #

Footnotes, Page 1-11: (1) Solid Waste Disposal Act Amendment of 1968, Senate Report No. 1447, July 22, 1968. (2) Testimony before House Interstate and Foreign Commerce subcommittee, June 29, 1965. (3) Solid Waste Disposal Act, Public Law 89-272, Oct. 20, 1965. (4) Mineral Waste Utilization Symposium, U.S. Bureau of Mines and IIT Research Institute, March 27-28, 1968. (5) New York Times, Sept. 25, 1967. (6) Testimony before Senate Public Works subcommittee, July 9, 1968. (7) M. N. Baker, bulletin of American Society of Civil Engineers, quoted in Cry California, Winter 1965-66. (8) Environmental Science & Technology, March, 1967. (9) Technology Review, May, 1968. (10) Testimony before House Science and Astronautics subcommittee, Jan.-March, 1968. (11) Speech to Natural Resources Committee, U.S. Chamber of Commerce, Feb. 2, 1968. (12) Congressional Record, April 27, 1967. (13) Natural resources message to Congress, March 8, 1968. (14) "Availability, Utilization and Salvage of Industrial Materials," Senate Public Works Committee, Jan. 8, 1968. (15) New York Times, Aug. 13, 1968. (16) Scientist and Citizen, Nov.-Dec., 1967. (17) Compost Science, Summer, 1968. (18) Environmental Science & Technology, August, 1968. (19) New Jersey v. City of New York, 290 U.S. 237. (20) Newsweek, March 18, 1968. (21) "Waste Management," Regional Plan Association, March, 1968.

# # #

HIGHWAY BILL TECHNIQUE CALLED "DANGEROUS" TO CONSERVATION

Conservationists voiced general dismay after President Johnson decided to sign the controversial Federal-Aid Highway Act of 1968. (See August 30, August 12 and July 5 issues of CF Letter.) The President, who himself called it a "setback to the cause of conservation," asked Congress to quickly correct its more "ill-considered" sections. But at the moment, there are no discernible moves in that direction.

Said CF President Russell E. Train: "The anti-conservation provisions of the law are a signal to all who oppose many of the great conservation advances of recent years that the way to turn back the clock . . . is to bury anti-conservation proposals under a layer of desirable proposals. The public has now learned that the conservation gains of recent years simply cannot be taken for granted. I only hope the highway lobby's success in eroding existing environmental safeguards will alert concerned citizens to this dangerous technique."

# # #

CF LETTER

The Conservation Foundation
1250 Connecticut Avenue, N.W.
Washington, D.C. 20036

9-27-68

RETURN REQUESTED

Safe Water Supplies Among Goals Of Newly Established HEW Agency

(Continued from page 1)

A graduate of Purdue University, where he also received his MSCE degree, and a Marine Corps veteran, Mr. Johnson is no stranger to the USPHS. His previous professional career as a commissioned officer there spanned the years from 1947-67, with his most recent post being that of Chief of the Office of Environmental Health, Division of Indian Health.

The Deputy Administrator is John J. Hanlon, M.D., who for the past four years has served as Public Health Director for the City of Detroit and Wayne County, Mich. Albert H. Stevenson, a career PHS officer and its Chief Engineer since 1966, was designated Associate Administrator.

Three Assistant Administrators also named were Edwin R. Lannon, Administration; Dr. Joseph A. Lieberman, Research and Development; and Jerrold M. Michael, Program Planning.

One of the three constituent agencies of CPEHS — and the one in which its water activities are centered — is the Environmental Control Administration, headed by Chris A. Hansen.

Commissioner Hansen was the first Chief of the Division of Research Services, National Institutes of Health, having held that post since 1956. Previously with PHS, he received his B.S. in civil engineering from North Dakota State College and his M.S. in sanitary engineering from the University of North Carolina.

The two other major components of CPEHS are:

- The National Air Pollution Control Administration, successor to the National Center for Air Pollution Control. Dr. John T. Middleton, who headed the Center for nearly two years, is Commissioner of the new body.
- The Food and Drug Administration, whose Commissioner is Dr. Herbert L. Ley, Jr.

Steel Industry Raises Pollution Control Outlay

The iron and steel industry will spend more than $222,000,000 for air and water pollution control facilities, according to an American Iron and Steel Institute survey.

Facilities to be placed in operation during 1968 or later, for which expenditures have been authorized, include $120,000,000 for water projects.

From 1951-67, the companies invested about $600,000,000 to provide pollution control systems.

The survey also disclosed that the industry's expenditures in 1967 for pollution control were up 67%, to $94,000,000, from $56,500,000 the previous year. Outlays included $54,700,000 for water, vs. $18,800,000 in 1966. (The figures do not include operating expenses.)

Eighty-three companies, accounting for nearly 98% of raw steel production, participated in the Institute survey.

HISTORY ON ICE

Army scientists at Byrd Station, Antarctica, have brought up a core of ice from the ice cap and labeled it "8000 B.C.," according to the New York State Health Department's *New York's Waters*. "Before the investigation of the water locked up in the glacier ends, the researchers will have bored down over 7,000 feet and recorded earth environment data going back 30,000 or 40,000 years."

For Future Reference

The second edition of *Directory of Personnel, Water Resources, Western New York*, has recently been issued by the Great Lakes Laboratory, State University College at Buffalo. Three indices —separated according to subject matter, personnel, and agency—provide a helpful breakdown of information.

The 110-page directory is distributed free of charge in an effort to promote greater cooperation and coordination among those involved with the water resources of western New York.

The Great Lakes Laboratory, which was authorized by the State University of New York in May, 1966, is a research-teaching facility. It is currently engaged in research concerning water and sediment chemistry, bottom organisms, interactions of algae and water quality, and the effects of selected toxicants on aquatic life.

Under the leadership of its director, Dr. Robert A. Sweeney, the laboratory has established a working relationship with a number of colleges, governmental agencies, and private industries.

* * *

How To Save on Public Contracts is the tital of an eight-page fact-folder recently published by the Water & Wastewater Equipment Manufacturers Association. Its theme is that long-range economy can be achieved through quality materials and equipment in water-supply and wastewater-treatment construction and improvements.

This is the third in a series of printed materials issued during the past two years by the National Water Institute, the public relations arm of WWEMA, located at Room 1250, 420 Lexington Avenue, New York, N.Y. 10017.

Symposium Accents Farm Pollution

(Continued from page 3)

pounds. To the best of our knowledge, these degrade to non-toxic materials that do not present a pollution hazard. Not applied directly to waterways, they should not be a hazard to life."

Commenting that fertilizers may be somewhat more of a problem, Dr. Doneen continued, "Only about 60% of the fertilizer applied is used by the plant. Nitrates, a threat to health, are an important constituent of these fertilizers and move rather freely through the soil. Some of it may get into underground water supplies."

A treatment for agricultural drainage waters — called algae stripping — was described in a paper by Louis A. Beck, Chief of the Quality and Treatment Unit, California Department of Water Resources, which was presented by G. Donald Miexner, Chief of the Department's Planning Section, San Joaquin District. This drainage water can stimulate uncontrolled algal growths when discharged in lakes, rivers, and bays, he said.

Algae stripping, now being tested at the Interagency Agricultural Waste Water Treatment Center near Firebaugh, Calif., is being developed for growing and harvesting the algae under controlled conditions. Benefits would be purifying the water and yielding a salable crop.

Pointing out that dried algae worth $9,000 could be produced each day from a flow of 700,000,000 gallons, he explained, "The most lucrative potential market is in the livestock and poultry industries. The algae could be substituted for fish meal. Poultry feeders are interested in both the protein and xanthophyll content of the algae. Xanthophyll adds desirable color to egg yolks and bird fat.

"We also have addressed an inquiry to the United Nations on the possibility of using algae as a high protein food supplement for human consumption. A possibility exists that a market could be developed for algae as a soil conditioner. Another possibility is digestion of the algae, creating methane gas, which could power motor-generator units. Potential power production is greater than the power requirements of the algae-stripping facilities."

Water in the News

compiled by THE SOAP AND DETERGENT ASSOCIATION • October 1968

Symposium Accents Farm Pollution

Farm animals contribute more polluting wastes to waterways than people . . . Interior's "non-degradation" policy is subject to ready challenge in the courts . . . A treatment called algae stripping is being developed, which could purify water and yield a crop worth $150 a ton.

These were some of the subjects that sparked lively discussion at the fourth annual International Water Quality Symposium in San Francisco. About 800 persons attended the August forum, sponsored by the Water Conditioning Association International and Research Council and the American Society of Agricultural Engineers.

The states and the Federal government were ranged like cowboys and Indians on the degradation issue.

Sen. Edmund S. Muskie, chairman of the Senate Subcommittee on Air and Water Pollution (his vice presidential nomination came later in the month), noted that one of the principal objectives of the Water Quality Act of 1965 is to enhance the quality and value of our water resources. "That purpose is based on the inescapable fact that our water demands are outrunning our available supplies in urban *and* rural areas."

Non-degradation Defended

"Water re-use is impossible if streams, rivers, and lakes are degraded," he declared. "This is a fact some individuals and groups have forgotten in their campaign against the Department of the Interior's non-degradation policy guidelines."

"The only practical as well as desirable approach to water management is to maintain high water quality where it exists and to improve it where it is not as high as it needs to be."

The Director of California's Department of Water Resources, William R. Gianelli, indicated that Interior Secretary Udall has backed off from his stringent interpretation of the Water

(Continued on page 3)

Charles C. Johnson, Jr.
CPEHS Administrator

Chris A. Hansen
ECA Aministrator

Safe Water Supplies Among Goals Of Newly Established HEW Agency

Progress is being made in the organization of the Consumer Protection and Environmental Health Service, the new agency which HEW Secretary Wilbur J. Cohen established this summer within the Public Health Service.

It will consolidate all departmental activities concerned with the safety of food and drugs, pollution control, and related health problems.

The launching of an active program has been awaiting approval by the Secretary of five task force reports relating to the reorganization. The target has been set for Oct. 1.

It is expected that the program will focus increased attention on water quality. Although CPEHS legislative activity in the water quality area is temporarily in abeyance, there is support for the passage of two companion bills introduced earlier this year — S. 3147 and H.R. 15899. These would strengthen HEW's authority to set standards for chemicals in interstate waters used for drinking water supplies. They would also authorize a study to determine what per cent of community water supplies conform to drinking water standards.

(The bills now appear to be dead for this session of Congress, but the legislation will probably be introduced in the next session of Congress.)

According to Secretary Cohen, CPEHS was formed "with the single purpose of making this a cleaner, safer, more healthful land for all consumers. Its programs are very broad, ranging from the testing of drugs to the control of air pollution. But its wide-ranging responsibilities are focused on one goal — the protection of America's health."

The Administrator of the new agency is Charles C. Johnson, Jr., who had been Assistant Commissioner of Health for Environmental Health in New York City's Health Department.

(Continued on page 4)

Water in the News
Published monthly by
The Soap and Detergent Association
485 Madison Ave., New York, N.Y. 10022
(212) 751-6080
Editor: MARY C. ANSBRO

PRINTED IN U.S.A.

Rain Called Source Of Vitamin B-12

A provocative article on rain as a source of vitamin B-12 — with comments on the ecological significance — appeared in the Aug. 10 issue of the British scientific journal *Nature*.

The author, Dr. Bruce C. Parker, associate professor of botany at Washington University, St. Louis, stated that the discovery stemmed from the observation that a species of Chlamydomonas repeatedly dominated the phytoplankton of a small experimental pond after the spring rains, and that a significant increase in soluble B-12 in this pond correlated consistently with these specific rains.

Noting that about 70% of all species of freshwater and marine planktonic algae require some form of vitamin B-12, Dr. Parker concluded that the ecological significance of rainfall bearing that vitamin, and perhaps other metabolites, too, may be considerable.

"If vitamin B-12 in aquatic ecosystems can be so limiting as to influence species composition and primary productivity, then rains containing this vitamin may directly affect the biology of lakes and seas."

PURE WATERS APPOINTMENT

Eugene F. Seebald has been named associate director of the New York State Health Department's Pure Waters Division. Formerly regional engineer of the department's Buffalo Regional Office, Mr. Seebald succeeds Arthur Handley, who resigned to become chief program planner for the State Pure Waters Authority.

ILLINOIS CONFERENCE SLATED

"Influence of Raw Water Characteristics on Treatment" is the title of the Eleventh Sanitary Engineering Conference, to be held in Urbana, Ill., Feb. 5-6, under the auspices of the Division of Sanitary Engineering, Illinois Department of Public Health, and the Department of Civil Engineering, University of Illinois. The conference is planned both for sanitary engineers and for water works managers and operators.

Problems Of Thermal Pollution Explored In FWPCA Statement

Thermal pollution poses one of the most difficult problems in water pollution control today.

So says an FWPCA staff paper, prepared for the Federal Water Pollution Control Advisory Board. The document provides considerable background on a problem now absorbing the attention of Federal and state officials and industries throughout the U.S.

Waste heat discharges — increasing rapidly since World War II — must be controlled if present and future uses of aquatic resources are to be protected, the FWPCA warns.

Condenser discharges are often 10-20° F. warmer than the receiving water, while a mere 3 or 4° F. temperature change can have serious consequences to the biota under certain conditions, the paper continues. Conditions critical to the aquatic environment involve both the level and duration of adverse temperatures.

Thermal Pollution Effects

"The ecological balance — the interrelationships of species, day length and water temperature — can sometimes be upset by small changes in water temperature with far-reaching effects." Some of the effects of thermal pollution cited are:

- A fish hatch might occur so early in the spring that the fishes' natural food organisms would be unavailable. Aquatic plants, the ultimate basis of the food chain, depend upon day length, as well as temperature.
- The sensitivity of aquatic life to toxic substances is heightened at increased temperatures.
- The oxygen consumption by aquatic vertebrates doubles for every 10° C. rise in stream temperature, but as temperatures rise, the water can hold less oxygen in solution.
- Thermally polluted waters are less capable of assimilating other wastes.
- The value of water for drinking, recreational and industrial use usually decreases at higher water temperatures. Higher temperature waters which contain organic nutrients may promote the development of slime or nuisance aquatic weeds, which tend to thrive in warmer waters. When these aquatic plants die, taste and odor problems in drinking water sources may result.

How can thermal pollution be reduced? The FWPCA suggests methods which fall into five categories: 1. management of waste heat in the aquatic environment (e.g. by dilution, dispersion, or increasing turbulence to provide aeration and cooling); 2. improved efficiency of thermal electric plants; 3. utilization of waste heat (e.g. for industrial process heating, desalting water, heating buildings); 4. disposal of waste heat to the atmosphere; 5. new methods of electric power generation.

The paper states that the power industry will have to play a key role in controlling thermal pollution because it makes a large point-source contribution to the problem.

More research will be required before the complex nature of thermal pollution can be fully understood, say the FWPCA staffers. However, they emphasize:

"We cannot afford the luxury of waiting for 'perfect knowledge' to act to limit damage from thermal pollution to our aquatic resources. The next 5-10 years will be critical to the future of these resources because of the staggering increases in electric power generation and waste heat. If positive action is put off until complete answers are available, the damage to our streams, lakes, and coastal areas will be great and could well prove irreparable in many areas."

It is recommended that industries should know and observe the approved water quality standards, and that thermal pollution control considerations become an integral part of industrial decisions and include plans for facilities to control such pollution.

The Federal government, continues the paper, must enforce water quality standards and provide technical and financial assistance for their implementation. Federal agencies must carefully review the many factors related to thermal pollution, including siting of electric power plants and effectiveness of control facilities.

Heat Pollution Termed A Top FWPCA Priority

Recent talks on thermal pollution by three key Interior Department officials — Assistant Secretary Max N. Edwards, Deputy Assistant Secretary Jacob I. Bregman, and FWPCA Commissioner Joe G. Moore, Jr. — accent the growing importance now being attached to this "new" threat to water quality.

According to Mr. Moore: "Because heat affects every organic factor in determining water quality and therefore, water use, the problems of dealing with thermal pollution are among the top priorities of the Federal Water Pollution Control Administration."

Detergents in the News

The detergent industry's recent contribution to the national clean-water effort is reviewed by SDA Research Director Theodore E. Brenner in an article in *The Journal of the American Oil Chemists' Society*, June issue.

Entitled, "The Impact of Biodegradable Surfactants On Water Quality," the paper cites findings of field studies conducted prior to the detergent conversion, of the monitoring program at full-scale sewage treatment plants throughout the country in the post-conversion period, and also such recent studies as that performed by the Illinois State Water Survey on the Illinois River. The results demonstrate the complete effectiveness of the conversion in terms of significantly lower surfactant residue levels.

* * *

Biodegradable detergents were the lead subject for a recent "Homemakers News" column in the Edwardsville, Ill., *Intelligencer*. Catherine R. Mauck, Madison County Home Adviser, University of Illinois College of Agriculture, Cooperative Extension Service, wrote:

"When several Wisconsin streams foamed last spring, most of the officials who investigated the incidents attributed the foam to natural causes, not to detergents. The reason? Since mid-1965, all household detergents manufactured for use throughout the U.S. have been made of 'soft' (biodegradable) materials — and subsequent tests have shown that the conversion to this type was highly successful."

New MCA Board Chairman Comments On Environment

Carl A. Gerstacker, chairman of the board of the Dow Chemical Company, has been elected chairman of the board of the Manufacturing Chemists Association.

According to an interview in MCA's newsletter, *Currents*, Mr. Gerstacker considers the restoration of environmental quality as an exciting challenge for the chemical industry.

Finding the means to reduce air and water pollution is a job for chemical research, the MCA chairman commented. Research efforts are going ahead at full speed in many chemical companies, he said.

N.H. Standards Approved

The approval — with exceptions — of New Hampshire's water quality standards brings to 42 the number of states and other jurisdictions whose standards have received Interior Department approval.

Among speakers at the Fourth International Water Quality Symposium, held recently in San Francisco, were, left to right: Jay Bingham, Western States Water Council; Frank Morison, Denver attorney-at-law; Kerry W. Mulligan, California State Water Resources Control Board; Joe G. Moore, Jr., FWPCA; and Sen. Edmund S. Muskie, D.-Me.

Water Symposium Explores Gamut Of Agricultural Pollution Problems

(Continued from page 1)

Quality Act and that the easing of Federal control will enable California to degrade water quality when it is felt to be justifiable for necessary economic or social development.

Some observers at the Symposium were not too optimistic that the change in interpretation of non-degradation would last. "This is the second interpretation of the Water Quality Act," said John E. Kinney, sanitary engineering consultant of Ann Arbor, Mich. "Who says there won't be a third interpretation? If a law can be so loosely interpreted, it is subject to ready challenge in the courts."

Labeling the wording of Interior's policy as "completely unacceptable to California," Kerry W. Mulligan, Executive Officer of California's State Water Resources Control Board, said the State Board is now considering its own anti-degradation policy. Under this policy, waters would be maintained at high quality unless it is "affirmatively demonstrated to the state that a change is justifiable because of necessary economic or social development and will not preclude present and anticipated use of such waters."

Jay R. Bingham, Executive Director of the 11-state Western States Water Council, asserted, "To rigidly enforce standards and impose a non-degradation policy would threaten the economic continuance of agriculture and thwart improvement or expansion of our vital agricultural enterprise."

Agricultural pollution stimulated other major discussions.

Mr. Gianelli called agriculture California's number one water polluter as well as the state's number one industry. "Agriculture now requires nearly 90% of our water use and, in terms of quantity, produces 80% of the waste water."

Hollis R. Williams said that farm animals contribute more polluting wastes to waterways than people and that animals are a far more serious problem. Mr. Williams is Deputy Administrator for Watersheds, U.S. Department of Agriculture.

"The magnitude of the problem becomes apparent," he stated, "when we realize that one cow will produce the fecal effluent equal to that of 16.4 people. We estimate that a feedlot handling 1,000 head of cattle would have the same waste disposal problem as a city of 16,400. A feedlot with 10,000 head equals a city of 164,000 — and this size feedlot is not at all uncommon. Each pound of meat means up to 25 pounds of manure."

Also discussing agricultural pollution, Dr. Lloyd D. Doneen, Professor of Water Science at the University of California, Davis, said that the pesticides that find their way into agricultural waste waters are not a serious threat.

"Toxic chlorinated hydrocarbons are being eliminated in agriculture and replaced by the organo-phosphorus com-

(Continued on page 4)

Mrs. Roger Westlund
2614 Sky High Drive
New Brighton, Minn. 55112
October 10, 1968

MEMO to Interleague Rice Creek Watershed Study Committee

Our next meeting will be Wednesday, October 23rd, at 1:00 PM at the home of Kay Wright, 1523 20th Ave. NW, New Brighton. Please call Eleanor Phillips at 560-6420 if you are unable to attend.

Our Agenda will include:

Reports for fact sheets (in edited form) as follows:

White Bear	What is a Watershed? Description of Rice Creek Watershed: physical (water course, soils) social (population, type of settlements)
New Brighton	Present uses of water of RCW Projected uses
Blaine	Past and current problems
St. Paul	Possible future problems
	Official policies and plans regarding RCW development and use:
Fridley	state agencies
Shoreview	county governments
Fridley	local governments
St. Anthony	other districts (NSSSD - St. Paul water dept)

Directions to Kay Wrights: Turn north off 694 on Silver Lake Road. Follow Silver Lake Road to 14th St. Turn right. Go east about 3 blocks to 20th Ave. - 1523.

October 2, 1968. Present: Kay Wright (Blaine), Avanelle Froehlich and Shirley Soll (St. Anthony), Eleanor Phillips (Fridley), Jeanne Crampton (White Bear Lake), and Pauline Westlund (New Brighton).

St. Anthony League has obtained local Board approval of RCW agreement.
Eleanor Phillips gave the following report on the NSSSD. Her source: David O. Harris, Fridley representative to NSSSD Board.

NSSSD (North Suburban Sanitary Sewer District) treats sewage only -- actually is a system of connections between member community systems, with the goal of building and using a common treatment plant. Plant construction due about 1970, plant ready about 1972-73. Will treat sewage 90%.

No storm sewer in system.

Member communities run their own system within their boundaries: NSSSD provides the hook-up. Member communities are: Fridley, Coon Rapids, Spring Lake Park, Mounds View, Circle Pines, Blaine, Lexington. Contract communities: Shoreview and New Brighton.

Member communities are obligated to pay off the bonds, contract communities are not. User rate is the same for all, but the connection charge is higher for contract communities, and they must pay it in advance (e.g. New Brighton has to pay about $700,000 to be connected, and before they could send sewage through the NSSSD pipe.)

Fridley has split system: generally south of 69th Ave. goes into Mpls. system, except that this boundary extends up to the north border of Fridley in section west of East River Road.

Charges are for volume of effluent only, not quality. Based on r.e.c. (residential elimination connection). A single-family dwelling equals 1 r.e.c.; A factory in this area may be up to 150 r.e.c. The connection charge for a connection is $200.00.

Urban areas are sewered, rural areas are not.

All industry in area is hooked up to sewer lines. New industry is required to be sewered for toilets and sinks, however, there is no requirement that industrial waste go through the sewer system. NSSSD does not set such requirements anyway - that is up to local govts, or the State Board of Health or Water Pollution Control Commission.

Pollution problems: Designaware plant in Fridley has an industrial effluent from their acid bath, containinga blue oxide which is rinsed off the aluminum. This is piped into Rice Creek at Lock Lake. Is no health hazard once it is in creek, but is unsightly and may have other deleterious effects. It cannot be piped into storm sewers without dilution because it is caustic. Matter is in hands of Water Pollution Control Commission now.

Forest Lake: effluent now goes into Rice Creek chain of lakes. NSSSD board hopes Forest Lake and Hugo obtain permission to build their sewage treatment facilities, because that will mean a decision favoring regional plants. For the foreseeabel future, it would be out of the question to build feeder lines as far east as Hugo and Forest Lake - there is little urban development inbetween to contribute to the cost of construction. Furthermore, construction is more costly in the type of soil (peat) intervening (between present part of sewerage system and the easter communities).

Construction costly in the peat soils: It is necessary to do a great deal of pumping so that work can go on, and the lines must be deep, below the hardpan. In some places the lines are 30-40 feet deep.

Ealeanor Phillips also reported on a report 'Planning District Two' put out by the Twin City Metropolitan Planning Commission. It gives recommended goals and standards for this area. The land zoned for building lots in the following areas are too small for cesspools in this type of soil: Linwood, Columbus, Lino Lakes, Forest Lake, Centerville, Hugo, New Scandia and Circle Pines.

None of Anoka County's soil conservation districts are in the RCW. Nor information could be obtained on soil conservation districts in Washington County. Ramsey County does not have soil conservation districts.

Eleanor Phillips had talked to a woman serving on the Board of the Minnehaha Watershed. This watershed is an area where it is very developed and cleaning up is going to have to be done. She suggested we talk to someone on the Nile Mile Creek Watershed which has a situation more similar to Rice Creek.

We discussed possible ways to present our material to our local Leagues. It seemed that fact sheets were the logical way to begin. Possibly sent to our members along with the monthly bulletins. It was hoped that we would put information in various local newspapers also.

Should a consensus be taken on this issue? Possible questions? What is an alternative to a Watershed. These are things we must decide.

Respectfully submitted,

Pauline Westlund, Acting Sec'y
Interleague Rice Creek Watershed Study Committee

FISCAL YEAR 1969

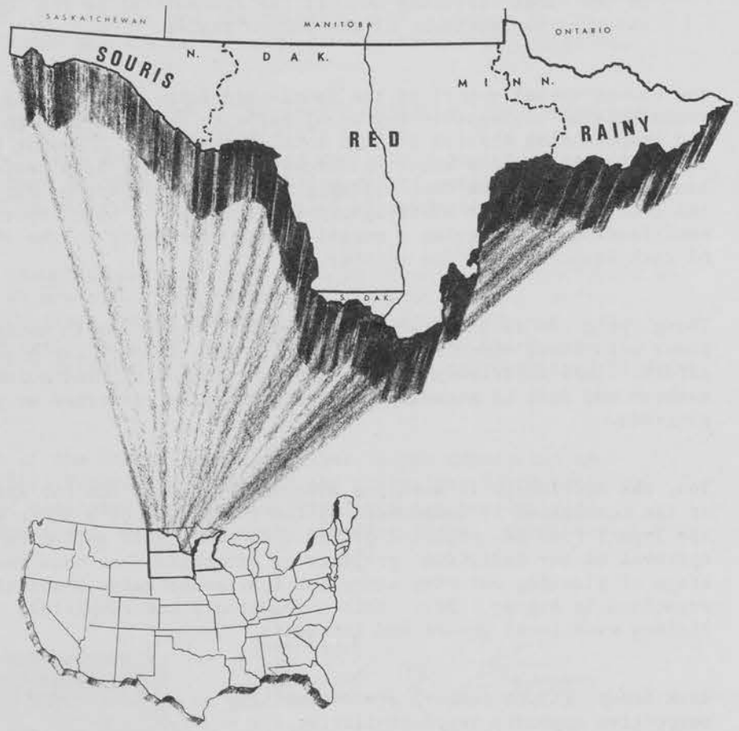
souris · red · rainy river basins commission annual report

Red River Valley Farm - Photo Courtesy W. B. Sebens, N. Dak. State Soil Conservation Committee, Bismarck

MEMBERSHIP
SOURIS-RED-RAINY RIVER BASINS COMMISSION
Gordon K. Gray, Chairman

State of Minnesota	Vice Chairman William C. Walton, Water Resources Planning Director, State Planning Agency
State of North Dakota	Milo W. Hoisveen, Secretary-Chief Engineer, State Water Commission
State of South Dakota	Milton E. Fischer, Water Resources Commission
Department of Agriculture	Charles A. Evans, North Dakota State Conservationist, U. S. Soil Conservation Service
Department of the Army	Col. Richard J. Hesse, District Engineer, St. Paul District, Corps of Engineers
Department of Commerce	Dr. Walter P. Thoresen, Area Director, Economic Development Administration
Department of Health, Education and Welfare	T. C. Ferris, Regional Program Director, Water Supply Program, U. S. Public Health Service
Department of Housing & Urban Development	Francis D. Fisher, Regional Administrator
Department of the Interior	Harrell F. Mosbaugh, Regional Coordinator
Department of Transportation	George H. Seaworth, Division Engineer, Bureau of Public Roads
Federal Power Commission	Lenard B. Young, Regional Engineer

SOURIS-RED-RAINY RIVER BASINS COMMISSION



ANNUAL REPORT
FY 1969

SOURIS-RED-RAINY RIVER BASINS COMMISSION

POLLUTED — PURIFICATION — POTABLE

HOLIDAY MALL - PROFESSIONAL CENTER - SUITE #6
MOORHEAD, MINNESOTA 56560
DIAL 218-233-1919
FTS 701-237-5227

September 25, 1969

To the Governors of the States of the Souris-Red-Rainy Basins and
to the Water Resources Council for Transmittal to the Congress
through the President of the United States:

The second annual report of the Souris-Red-Rainy River Basins Commission represents an appreciable degree of maturity realized through the cooperative and compromising efforts of it's total membership. Planning Guidelines, as established by the Water Resources Council, have been tested first-hand and proven to be most valuable in providing a common direction for the traditions of our multi-agency composition. I have experienced satisfaction in observing a mutual growth of respect in the attitude of each agency toward one another.

Though progress is satisfactory to date, deficiencies in money and man-power with State agencies are obvious in this cooperative planning effort. This deficiency accentuates the provincial tendencies of State members and must be steadily and systematically corrected as planning proceeds.

Too, the difficulty in securing adequate publicity for the activities of the Commission is compounded by the insistence of a State member that the Type I Plan be completed previous to Commission action on or approval of any individual projects or proposals that have reached a stage of planning maturity since the Souris-Red-Rainy Commission was organized in August, 1967. This circumstance has completely stifled liaison with local groups and interests.

Work Groups (15 in number) are essentially on schedule with their respective Appendix responsibilities for the Type I Study due July 1, 1970. Plan Formulation & Alternatives (Work Group N) has fallen behind with its important task of arbitration due mainly to consistent demands of this Executive Group to resolve policy decisions. That bottleneck has been resolved by establishing both executive and technical Plan Formulation Work Groups.

A significant step forward was taken by the Commission in finalizing a Type II Study involving a major portion of the Red River Basin. Governmental support is now required so that this Type II Study will be funded by Congress for a FY 1971 start.

Deliberation and compromise are fundemental ingredients in basic resource and multi-functional planning. These ingredients are severely tested by the presence of a predominately agricultural economy and a modest population factor. Paramount planning decisions occasioned by the character of land, water and economic resources of the region involve; providing feasible flood control measures in areas having negative topographic features (flat land); resolving the conflict of land use for drainage versus waterfowl production; realizing satisfactory appropriation rates for the reauthorized Garrison Diversion Project; and the experience of a change in the historic population pattern as stimulated by governmental decisions.

With the questionable exception of weather conditions, the Souris-Red-Rainy basins offer the ultimate potentials for diversified agricultural production, both land and water-oriented recreation opportunities, and the good life that is open to the establishment of small industries on a land that is uncluttered and unspoiled by congestion and pollution.

Comprehensive planning on a national scale is essential to the future of this region. We are off to a good start. I regret leaving the post as Commission Chairman due to a change in the national administration and strongly suggest that the position of River Basin Chairman be established for a definite term which would conform to recognized Study periods.

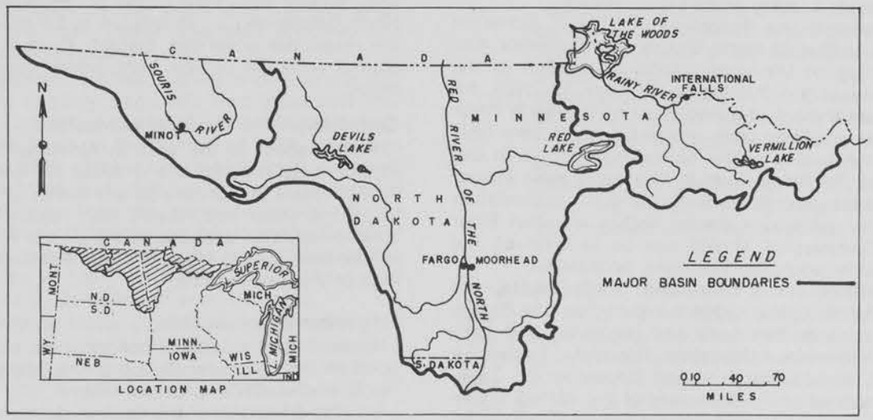
The membership of the Souris-Red-Rainy River Basins Commission is outstanding. Both Federal agencies and the States are represented by experienced and dedicated men who will develop a progressive and prudent Plan for these basins and their abundant latent potentials.

Sincerely,

Gordon K. Gray

Gordon K. Gray
Chairman

TABLE OF CONTENTS



Souris-Red-Rainy River Basins Region

INTRODUCTION

Creation of the Commission

The Souris-Red-Rainy River Basins Commission was created on June 20, 1967, with the signing of Executive Order No. 11359 by President Lyndon B. Johnson. The President, concurrently therewith, named Gordon K. Gray as the Commission Chairman.

The Water Resources Planning Act

Public Law 89-80, the Water Resources Planning Act, July 22, 1965, and the authority under which the Commission was established, contains the following Statement of Policy:

> "In order to meet the rapidly expanding demands for water throughout the Nation, it is hereby declared to be the policy of the Congress to encourage the conservation, development, and utilization of water and related land resources of the United States on a comprehensive and coordinated basis by the Federal Government, States, localities, and private enterprise with the cooperation of all affected Federal agencies, States, local governments, individuals, and others concerned.

Title II of the Act provides for the creation of River Basin Commissions:

> "Sec. 201 (a). The President is authorized to declare the establishment of a river basin water and related land resources commission upon request therefor by the Council, or request addressed to the Council by a State within which all or part of the basin or basins concerned are located if the request by the Council or by a State (1) defines the area, river basin, or group of related river basins for which a commission is requested, (2) is made in writing by the Governor or in such manner as State law may provide, or by the Council, and (3) is concurred in by the Council and by not less than one-half of the States within which portions of the basin or basins concerned are located and, in the event the Upper Colorado River Basin is involved, by at least three of the four States of Colorado, New Mexico, Utah, and Wyoming or, in the event the Columbia River Basin is involved, by at least three of the four States of Idaho, Montana, Oregon, and Washington. Such concurrences shall be in writing."

Commission Responsibilities

As provided by Sec. 201 (b), such commission for an area, river basin, or group of river basins shall, to the extent consistent with Section 3 of this Act:

(1) Serve as the principal agency for the coordination of Federal, State, interstate, local and nongovernmental plans for the development of water and related land resources in its area, river basin, or group of river basins;

(2) prepare and keep up to date, to the extent practicable, a comprehensive, coordinated, joint plan for Federal, State, interstate, local and nongovernmental development of water and related resources: *Provided,* That the plan shall include an evaluation of all reasonable alternative means of achieving optimum development of water and related land resources of the basin or basins, and it may be prepared in stages, including recommendations with respect to individual projects;

(3) recommend long-range priorities for the collection and analysis of basic data and for investigation, planning, and construction of projects; and

(4) foster and undertake such studies of water and related land resources problems in its area, river basin, or group of river basins as are necessary in the preparation of the plan described in clause (2) of this subsection.

The Souris-Red-Rainy River Basins Commission - Events Leading to its Establishment.

Pursuant to the Provisions of Title II, Governor William L. Guy of North Dakota and Governor Karl F. Rolvaag of Minnesota made application to the Secretary of the Interior on October 30, 1965, for the establishment of a Red River of the North Basin Commission. They were advised a short time later that if the basins of the Souris River in North Dakota and the Rainy River in Minnesota were included with the Red River Basin, and if consideration would be given to a merger with a Missouri River Basin Commission, should one be established, the application would be favorably considered.

The Governors of Minnesota, North Dakota, and South Dakota concurred in the formation of a Basins Commission on this basis and requested that such a Commission be established. The Water Resources Council, by resolution passed December 28, 1966, recommended to the President of the United States that the Souris-Red-Rainy River Basins Commission be created.

Area and Jurisdiction

The areas of the basins and jurisdiction of the Commission extend to those portions of the States of Minnesota, North Dakota and South Dakota that are drained by the Souris-Red-Rainy Rivers system. These areas comprise about 59,300 square miles, of which approximately 28,475 square miles are in Minnesota, 29,850 square miles are in North Dakota, and 975 square miles are in South Dakota. In addition, there are about 30 square miles in northeastern Montana.

Membership

The Executive Order provided that, in addition to the Chairman, the Commission shall consist of one Federal member from each of the Federal Departments, who have a substantial interest in the work to be undertaken by the Commission in the basins, which were determined by the President to be the Departments of Agriculture; Army; Commerce; Health, Education, and Welfare; Housing and Urban Development; Interior; and Transportation; and the Federal Power Commission; to be appointed by the head of each department or agency; and one member from each of the States of Minnesota, North Dakota and South Dakota, to be appointed by the respective governors thereof. Current membership is reflected on the front, inside cover of this report.

Consultation with the State of Montana

With respect to the area in Montana, the Commission was directed "to provide for consultation with the State of Montana on any matter which might affect the water and related land resources of the small headwater drainage of the Souris River Basin in Montana, and to give notice to Montana of meetings of the Commission."

International Coordination

Regarding international coordination, such as related to the proposed Pembina River development, the Executive Order provides that:

> "The Chairman of the Commission is hereby authorized and directed to refer to the Council any matters under consideration by the Commission which relate to the areas of interest or jurisdiction of the International Joint Commission, United States and Canada. The Council shall consult on these matters as appropriate with the Department of the State and the International Joint Commission through its United States Section for the purpose of enhancing international coordination."

Termination of the Commission

The Executive Order which established the Commission, also provides that:

> "Consideration shall be given to consolidating the Commission with a Missouri River Basin Commission, if and when such a Commission is established. If a consolidation does not occur, the Commission shall terminate within six months after the submission of the comprehensive river basin plan in accordance with Section 204 (3) of the Act, or on June 30, 1972, whichever is earlier; unless upon recommendation of both the Council and not less than one-half the number of member States, this order is extended."

HISTORY OF PREVIOUS PLANNING

Tri-State Water Commission

The need for some type of coordinated water and related land resources planning effort for the orderly but accelerated development of the Red River of the North region was recognized years prior to the establishment of the Souris-Red-Rainy River Basins Commission. Partly as a result of the ravaging floods which occurred in the mainstem and tributary streams of the Red River prior to 1930 but primarily because of the severe drought conditions which descended upon the area after 1930 and threatened municipal and agricultural water supplies, the Governors of Minnesota, North Dakota, and South Dakota held a tri-state conference in Fargo in July of 1935 to discuss their mutual concern over existing problems. They agreed that a coordinated water plan for the entire basin should be formulated as a necessary preliminary to effective action. An Interstate Committee was organized in November of that same year and was charged with undertaking the studies essential to such a plan.

Headquarters of the Committee were located in St. Paul, Minnesota, and the work was carried on through the State Planning Boards. Specific studies were undertaken by the water and sanitary engineers of the three states, who also reviewed and updated basic hydrologic data.

Accompanied by State, County, and local officials, water and sanitary engineers and interested citizens, the Committee conducted an extended inspection of the basin in the Spring of 1936. Meetings were held each night during which local problems were presented and discussed. An outgrowth of these meetings was the recommendation that a Tri-State Water Commission be formed. Enabling legislation was enacted by the legislatures of the three States in 1937, and in April, 1938, by Act of Congress, the Commission was approved.

The Tri-State Water Commission was reasonably active from its inception until about 1945. It held its first official meeting in Eureka, South Dakota on June 16, 1937, and its last official meeting in Moorhead, Minnesota on August 6, 1943. Since that time, the Commission has been, for all practical purposes, inactive or dead.

Its failure is attributed to two factors: (1) at only 10 of the 17 meetings held by the Commission was there present a legal quorum; (2) although the Commission was given jurisdiction over the entire area of the Red River of the North, the Minnesota legislature, in authorizing the pact, specifically provided that "said commission shall have no power or jurisdiction over water levels or stream flow in the Otter Tail River."

Since the foregoing area is the source of a large portion of the flow in the Red River, its exclusion weakened the effectiveness of the Commission. Efforts since the date of its last activity to revive the commission have failed.

Red River Basin Planning Committee

In September of 1961, the States of Minnesota and North Dakota discussed the advisability of reactivating the Tri-State Water Commission. In January, 1962, at a meeting held to discuss the question further, the Red River Basin Planning Committee was established in lieu of further attempts to reactivate the Tri-State Water Commission. The principal purposes and objectives of the newly formed Committee were to:

(a) Cooperate with other agencies in the preparation of plans and programs for the development and conservation of all natural resources;
(b) Assist in correlating action programs of Federal and State agencies;
(c) Stimulate and encourage local and State Planning;
(d) Serve as a clearing house of information for local, State, and Federal planning agencies;
(e) Give consideration to the formulation of a Red River of the North Basin Compact;
(f) Develop and annually update a five-year action program;
(g) Establish and annually review priority ratings of public works projects for the conservation and development of water resources in each of the state areas on a basin-wide basis;
(h) Make annual reports to the Governors of Minnesota and North Dakota of its operations, accomplishments and plans; and
(i) Exercise and perform such functions for or incidental to the achievement of the purposes and objectives hereunder.

The last regular meeting of the Committee was held in Fargo, July 29, 1966, at which all members were present except Governors Rolvaag and Guy, and members Gutaw and Enright. About 30 Federal, State and local officials and visitors were present. The main purpose of the meeting was to hear Henry P. Caulfield, Jr., Executive Director, Water Resources Council, discuss the provisions of Public Law 89-80 and the application of Governors Guy and Rolvaag for the establishment of a Red River Basin Commission thereunder.

On August 3, 1967, the Committee met briefly to formally terminate its activities and to offer its records, papers and files to the newly-created Souris-Red-Rainy River Basins Commission.

U. S. Forest Service Photo
Rainy River Basin Scene

Other Planning Efforts

Data collected over the years by Federal, State and local entities and by private interests is being used to the full extent possible in preparing the Souris-Red-Rainy Comprehensive Plan. It is worthy of note that while numerous studies and surveys have been conducted by all levels of government and the private sector, the current Commission effort is the first such effort which is regionally oriented. For this reason, much of the data collected to date is too general or piecemeal to fully satisfy current data requirements. At the outset of the Framework effort there were known data gaps, but these and data needs growing out of the Framework effort are being filled.

A partial list of studies, either completed or instituted prior to embarking upon the current Type I Study, includes:

Interim North Dakota State Water Resources Development Plan; Appendixes A-E, (1968). Published in December, 1968, the North Dakota Plan contains valuable data and information applicable to the study area. It is also an expression of the State's viewpoint regarding future water and related land resources development.

Minnesota State Water and Related Land Resources Development Plan. Scheduled to be published in 1969, the Minnesota Plan will contain much valuable data and information. Like the North Dakota Plan, it is expected to express the State's attitude regarding future water and related land resources development.

House Document 185, 81st Congress, 1st Session. (Corps of Engineers Survey Report, 1947). A plan for water resource development in the Red River of the North Basin. This study considered basin needs for navigation, flood control, water supply and pollution abatement and included a coordinated water plan for regulation of flows in all multiple-purpose reservoirs in the basin. A basin-wide review of the report was directed by Congress following the serious floods of 1950. The basin-wide study is currently underway with several studies being made for individual problem areas or streams.

SCS Photo

A small floodwater retarding dam on the Tongue River in Pembina County, N. Dak.

Report on Drainage and Prevention of Overflow in the Valley of the Red River of the North. Bulletin No. 1017, 1922, U. S. Department of Agriculture. This report presents a comprehensive plan for drainage and flood control, and it includes flood outlines for the 1897 flood which was the flood of record at many locations in the basin.

The Conservation Needs Inventories. Prepared by the U. S. Department of Agriculture for the States of Minnesota, North Dakota and South Dakota; contain data on land use, land capabilities, soil and water conservation needs.

Garrison Diversion Unit Reports. (Main Report, 1957; Supplemental Report, 1952, Revised, 1965). Provides for the diversion of water from Garrison Reservoir (Lake Sakakawea) for irrigation, municipal and industrial use, fish and wildlife conservation, recreation, flood control and pollution abatement.

Water Supply and Water Quality Control Study, Red River Basin. July, 1965 A Public Health Service report of 1965-2015 needs for water supply and water quality control.

House Document 325, 86th Congress. A Bureau of Reclamation (USDI) Report recommending diversion to the Souris-Red-Rainy region as well as within the Missouri River Basin for a variety of uses.

The Bureau of Sport Fisheries and Wildlife, Minnesota Department of Conservation and North Dakota Game and Fish Department have prepared various reports and other unpublished data on several aspects of fish and wildlife resources concerned with water and related lands.

The Federal Power Commission prepared a Planning Status Report for the Hudson Bay Basin, North Dakota-South Dakota in 1965. The report includes data on existing water resource developments and known potential for hydroelectric power in the Souris-Red-Rainy region.

The Federal Water Pollution Control Administration is currently making a comprehensive water quality study for the Red River Basin. Similar studies are scheduled to start for the Souris and Rainy River Basins.

Many other comprehensive reports have been prepared by Federal, State, local and private agencies which may be of value in the comprehensive Type I Study. However, these are too numerous to list. Some of the more valuable include the national studies by the Bureau of Outdoor Recreation and the National Power Survey by the Federal Power Commission, Forest Survey of the U. S. Forest Service, recreation studies and reports by the States, the Hydrologic Atlases prepared by the Minnesota Department of Conservation, and the biennial reports of the Minnesota Department of Conservation. Also, valuable reports are referenced in *Conference Proceedings on Water Resource Problems of the Souris-Red-Rainy Basins,* October 31, 1967, North Dakota State University, Fargo, North Dakota.

PUBLIC CONTACTS

During the period covered by this report, the Commission met three times in Moorhead, Minnesota; once in the Rainy River Basin (Hibbing and Ely, Minnesota); and once in the Souris River Basin (Minot) in North Dakota. The latter two cited meetings were held in keeping with the principle that interested citizens residing within the boundary of the Commission's jurisdiction should be apprized of the activities of the Commission and shall be participants in the planning process. Moreover, it was deemed necessary that Commission members acquire a first-hand, up-to-date knowledge of the basins' natural and human resources.

Numerous meetings have been held throughout the region by the 14 work groups activated to date.

Commission Photo

The Executive Committee — in session

The Chairman and/or members of the Commission staff have appeared before the Minnesota and North Dakota Citizens Advisory Councils; the Souris River Board of Control; local officials from the Fertile and Warren, Minnesota areas; North Dakota Water Users Association; North Dakota Water Resources Research Institute Advisory Committee; numerous local service clubs; and a "Seminar of Water Resources Planning and Development" held during the Red River Valley Winter Show, Crookston, Minnesota.

In March, the Commission published 5,000 copies of its first informational brochure. Since then, it has received wide distribution throughout the three-basin region. A second brochure is being developed at the writing of this report.

ORGANIZATION

All participating States and Federal agencies are organized to collect and assemble the data, analyze problems, forecast needs and goals, formulate solutions to problems and compile a report.

The *Work Group* approach is being employed, with a lead agency selected for each. The Commission member representing the lead agency has the primary responsibility for meeting the established deadlines and for the quality of the assigned appendix. Work Group N (Program Formulation and Alternatives) serves as an inter-agency technical group to implement plan formulation, to monitor progress and to provide guidance on study scope and detail.

Each State has representation on each of the Work Groups.

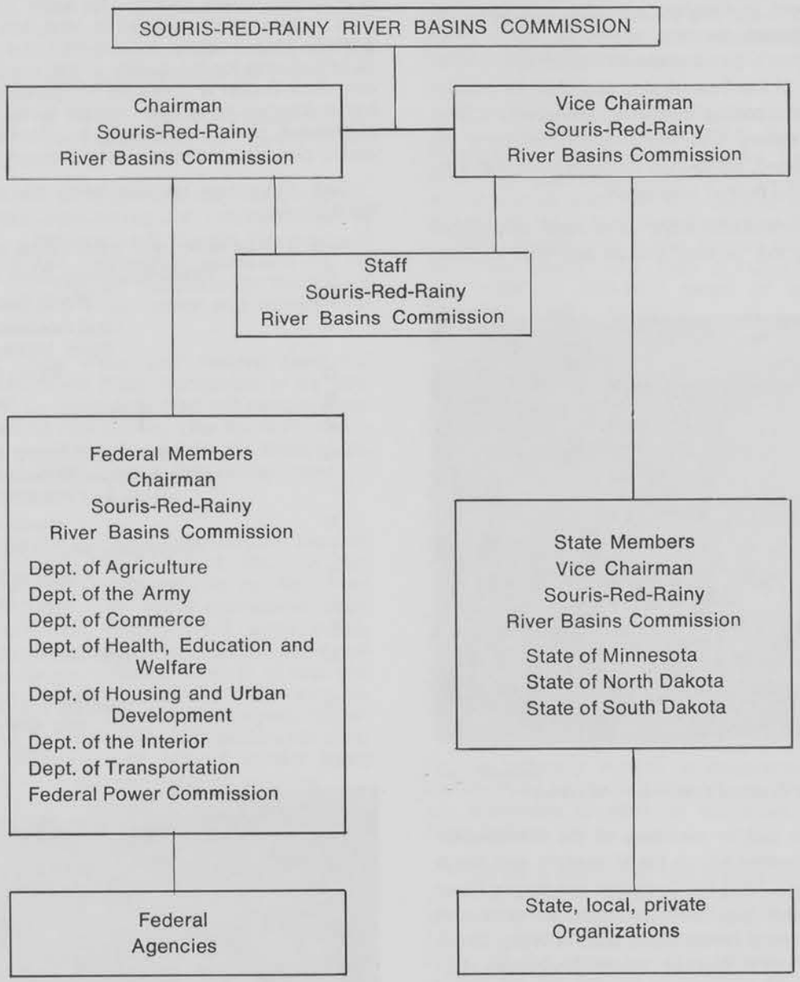
Work Groups have been established as follows:

A	Socio-Economic Base Studies
B	Water Resources
C	Land Resources and Water Management
D	Flood Control
E	Drainage
F	Irrigation
G	Municipal, Industrial, and Miscellaneous Water Requirements and Health Aspects
H	Water Quality
I	Recreation and Preservation
J	Fish and Wildlife
K	Minerals
L	Power
M	Legal and Institutional Environments
N	Program Formulation and Alternatives
	Main Report

Commission Photo

Appendix Reports are subjected to detailed review by Work Group members

The following Organization Chart was developed early in the planning process and made a part of the Type I Plan of Study. It represents, graphically, a system under which maximum cooperation and coordination between the States and the Federal Agencies is facilitated.



BYLAWS
OF
SOURIS-RED-RAINY RIVER BASINS COMMISSION

Adopted by Consensus

August 30, 1967

PART ONE
Public Law 89-80

Basic Act. The basic Act of Congress, cited as the Water Resources Planning Act (hereinafter referred to as the Act, Public Law 89-80, 79 Stat. 244, 42 U.S.C. 1962 et seq.), describes the objectives and duties of the Commission in Title II, Section 201 (b) and Section 204. The powers and certain administrative provisions of the Commission are detailed in Title II, Section 205. The entire Act is by reference made the first part of these bylaws. Any amendment thereof shall be considered as automatically amending Part One of these bylaws accordingly.

PART TWO
Establishment of Commission

Executive Order. The second part of these bylaws consists of the Executive Order of President Lyndon B. Johnson (No. 11359) issued June 20, 1967, establishing the Souris-Red-Rainy River Basins Commission (hereinafter referred to as the Commission), identifies the area of jurisdiction thereof, establishes its membership, sets certain requirements regarding relations with the State of Montana and Canada, and is by reference made a part hereof. Any amendment thereof shall be considered as automatically amending Part Two of these bylaws accordingly. Concurrently with the issuance of the Executive Order the President named Gordon K. Gray of Valley City, North Dakota as Chairman of the Commission.

PART THREE
Council Rules and Regulations

Authority. The Rules and Regulations proposed by the Council as Part 702 to Chapter VI, Title 18 of the Code of Federal Regulations, as they may finally be adopted, are by reference made the third part of these bylaws. Any amendment thereof shall be considered as automatically amending Part Three of these bylaws.

PART FOUR
Commission Rules and Regulations

Non-Federal. The fourth part of these bylaws covers certain points and areas not included under Parts One, Two and Three that are considered necessary to assure orderly conduct of the Commission.

ARTICLE I
Meetings

Sec. 1. *Regular.* A regular meeting of the Commission shall be held during each calendar quarter at a time and place designated by the Chairman with the concurrence of the Vice Chairman.

Sec. 2. *Special.* A special meeting of the Commission may be called and held at such time and place as may be designated by either the Chairman or the Vice Chairman with the concurrence of the other.

Sec. 3. *Notice.* Written, printed, or telegraphic notice, or any duplication thereof, stating the time and place of any regular or special meeting shall be delivered or transmitted not less than fifteen days prior to the convening of the meeting by the Chairman or Vice Chairman to each member and alternate at his usual place of business or residence as carried on the records of the Commission, the Water Resources Council, the Montana Water Resources Board, and the United States Section of the International Joint Commission, United States and Canada. If mailed, such notice shall be considered to be given or delivered to each addressee when deposited in the United States mail with ordinary postage prepaid.

Sec. 4. *Agenda.* Not less than fifteen days prior to any regular or special meeting, there shall be sent to each member and alternate an agenda, including reports and other pertinent information, especially as pertains to any issue upon which consensus is to be requested at such meeting.

Sec. 5. *Quorum.* A majority of the State members together with a majority of the Federal members shall constitute a quorum for the transaction of business.

Sec. 6. *Voting.* A majority vote of the Federal members together with a majority vote of the State members shall be required for the adoption of any proposal, resolution or motion under consideration and submitted to a vote of members on which a consensus is inapplicable or not required.

Sec. 7. *Alternates.* In the case of absence or inability of a member to act he shall be represented by his alternate. A member may request that his alternate be permitted to participate with him at any Commission meeting in the consideration of all matters relating to their areas of responsibility.

Sec. 8 *Open to Public.* All Commission meetings, except executive sessions thereof, shall be open to the public.

ARTICLE II
Parliamentary Procedure

Sec. 1. *Authority.* The most recent edition of Robert's Rules of Order shall be used in determining questions of procedure, with the following exceptions:

(a) Consensus shall be deemed to mean "the judgment arrived at by most of those concerned," separately by state and federal membership. A member, although present, may elect not to participate in a decision.

(b) The usual procedures shall be followed in perfecting a motion through amendment, substitution or deletion of matter in order that all variations may be considered before a consensus is called for.

(c) Consensus shall be required only on final determination of an issue in the form of a proposal, motion or resolution.

(d) Either the Chairman or the Vice Chairman may temporarily suspend consideration of any issue when in his judgment such temporary suspension of consideration will increase the probability of securing consensus on the issue.

(e) The Chairman shall submit the question of securing consensus on the issue in general language, such as: "Is there any objection to the adoption of the motion (or proposition) now before the Commission?" If there is no objection, the Chairman shall state that the motion (or proposition) is adopted by consensus. If there is objection, it must be stated orally or by sign from the member. All objections shall be recorded in the minutes.

Sec. 2. *Order of Business.* (a) The order of business of each meeting may be suggested in the meeting call. Such suggested order of business may be changed, a matter for consideration added or deleted by a vote as provided in Article I, Section 6. No debate on the merits of a proposed addition or deletion to the matters under consideration shall be in order prior to the action thereon.

(b) If no order of business is suggested in the meeting call, it shall generally be in the following order:

(1) Call to order.
(2) Quorum check — roll call of officers and members.
(3) Introductions.
(4) Reading of and action on minutes of previous meeting.
(5) Reports.
(6) Unfinished business.
(7) New business.
(8) Announcements.
(9) Time and place of next meeting.
(10) Adjournment.

ARTICLE III
Committees, Work Groups, Task Forces, Deadlines

Sec. 1. *Establishment of.* The Commission may by consensus establish committees composed of members. It may likewise authorize subcommittees of an advisory nature, work groups and task forces, the members of which need not be Commission members; set deadlines for submission of annual and other reports; and determine such other procedural questions as may be necessary for the Commission to perform its functions. Members of such committees, subcommittees, work groups and task forces may be appointed by the Chairman with the concurrence of the Vice Chairman. The Commission may by consensus terminate any such committee, subcommittee, work group or task force.

Sec. 2. *Related Programs.* Each federal agency and state member shall file with the Commission periodically an outline of programs including initiation, progress, or termination, of such federal agency or state which may be undertaken separately but related to the duties and responsibilities of the Commission and shall file with the Commission a copy of progress, preliminary, or final reports, or other findings or results of such programs' activities.

ARTICLE IV
Expenses of Officers and Members and Commission Meetings

Sec. 1. *Chairman.* The salary, personnel benefits and travel expenses of the Chairman shall be paid by the Water Resources Council.

Sec. 2. *Members.* The travel expenses, per diem, and all other expenses of members of the Commission shall be an expense of the State or of the Federal Department they respectively represent, except that the Chairman may authorize travel expenses and per diem when a member is asked to attend meetings or perform duties as a representative of the Chairman or Commission.

Sec. 3. *Vice Chairman.* Expenses and any compensation allowed the Vice Chairman shall not be charged against Commission funds insofar as they result from the performance of his duties as coordinating officer of the State members of the Commission and when representing the State governments in Federal-State relations on the Commission, but he may be reimbursed by the Commission for expenses incurred on Commission business when requested by the Chairman to represent the Commission. He may also be reimbursed by the States for expenses incurred in serving as Vice Chairman and coordinating officer of the state members of the Commission and in representing the State governments in Federal-State relations.

Sec. 4. *Commission Meetings.* Expenses related to Commission meetings such as travel, meals, lodging, and beverage will be borne by the appropriate Commission members. Gratuities extended to the Commission by municipalities or other interest groups shall not be solicited by the Commission, but may be accepted by the Commission without obligation.

ARTICLE V
Commission Budget

Sec. 1. *Preparation of.* (a) The Chairman shall prepare annual and other budgets for operation of the Commission and staff that will reflect Commission costs by fiscal periods coincident with Federal fiscal periods, and at such times as will, as near as possible, accommodate the budget preparation schedules of the Water Resources Council and of those States supplying funds for Commission operation.

(b) Each proposed budget shall be presented to the member States and to the Water Resources Council for comment in preliminary form. The Chairman shall present a final draft of each budget request after opportunity for response has been had, and the budget shall reflect a total the Chairman feels is needed and within the possibility of funding.

ARTICLE VI
Personnel Information

Sec. 1. *Preparation of.* The Chairman shall prepare a manual of personnel practices, including a salary schedule, which shall be reasonably in line with compensation paid for like services rendered to the Federal Government or to the State Government of the State in which the Commission headquarters are located.

ARTICLE VII
Commission Office

Sec. 1. *Location.* (a) The selection of the headquarters city for the office of the Commission shall be a matter for decision by consensus. Such decision shall be conditioned upon the Chairman being able to secure suitable office space within such city for efficient operation. The decision may empower the Chairman to enter into a contract for office space for a period not to exceed five years, subject to cancellation under such penalties as shall be reasonable and acceptable to the Water Resources Council. The Chairman may contract with the General Services Administration or the agency of the Government of the State of location charged with administration of leased space to negotiate the rent and other conditions of the lease.

(b) In the event the Commission is unable to attain consensus on the location of the Commission headquarters, the Chairman shall make such arrangements of a temporary nature as he shall deem most practical, except that he shall not enter into any lease arrangement subject to any penalty for cancellation after one year.

(c) The Chairman may lease space outside the headquarters city when such space is necessary for Commission activities, but such leased space shall be for no longer period than one year, except that a renewal option may be included.

ARTICLE VIII
Amendments to Bylaws

Sec. 1. *How amended.* These bylaws may be amended at any regular or special meeting of the Commission, provided proposed amendments thereto are set out in full in the call of the meeting.

WATER NEEDS, AVAILABILITY AND PROBLEMS

Flood Prevention and Control

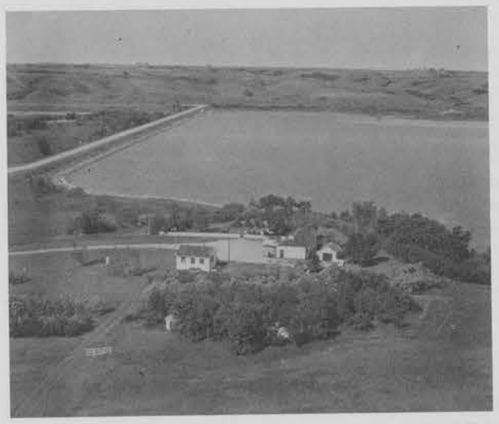
With the continued development of the Souris-Red-Rainy region, losses associated with flood flows will become a greater burden on the economy.

Probably the most serious flood problem of the Rainy River Basin is that associated with the regulated lake levels of Lake of the Woods and Rainy Lake. High lake stages do, on occasion, cause property damage to bordering properties, but the extent of historical damages caused by flooding in the basin do not begin to approach the magnitude of losses incurred in the Souris and Red River Basins.

The principal flood control structure in the Souris River Basin is a 112,000 acre-feet reservoir (Lake Darling) above Minot, North Dakota. Lake Darling dam was constructed by the U. S. Fish & Wildlife Service in 1936 primarily for water supply to downstream wildlife refuges. However, the reservoir has been operated for flood control insofar as such use has been compatible with the primary low-flow supplement purpose. Until the spring of 1969, the reservoir had successfully reduced flood peaks at Minot to near bankfull capacity. (An account of the 1969 record flood at Minot can be found in another section of this report.)

The Corps of Engineers has completed a study to determine the feasibility of additional flood protection on the Souris River at and in the vicinity of Minot. Minor flood control works have been installed at Bonnes Coulee and the Souris River near Velva.

The development of the Red River Basin—due to the growth of the agricultural economy—has understandably resulted in encroachment on the very extensive tributary and mainstem floodplain. Much of the urban encroachment can be attributed to the lack of high-ground areas suitable for development. Over 2 million acres of valley land are subject to damage by flooding.



BSFW Photo

Lake Darling Dam, Souris River Basin

Two separate types of flooding can be identified —the usual type associated with streambank overflow and another type caused by snowmelt entrapped by plugged culverts and ditches within sections of land bounded by raised roadways. This water accumulates slowly, overflows the roadways when it has reached sufficient depth, and inundates section after section of land as it moves overland in the direction of the regional slope. Inadequate channels and the characteristic flatness of the land contribute to the magnitude of this latter type of flooding.

Data on flood occurrences prior to 1873, when a river gauge was established at Grand Forks, are not available in the United States. However, early records maintained in the vicinity of Winnipeg indicate that several major floods occurred in the 1800's, the most notable being those of 1826 and 1852 which exceeded by several feet the greatest floods in recent years. The Winnipeg records indicate the probability that floods exceeding the maximum of record may also have occurred in the United States in the early 1800's, particularly in the northern half of the valley. The greatest recorded flood at Grand Forks was that of 1897 with an estimated peak discharge of 80,000 cfs. The 1966 flood at Grand Forks was triggered by rapid snowmelt following the March 3 blizzard. It produced the peak flow of the century at Grand Forks (55,000 cfs) but that discharge was exceeded by the 1950 flood peak downstream. Damages from the 1950 flood, which were estimated at $33 million at that time, included damages to farms and crops, urban developments and transportation systems. Urban, agricultural, transportation and emergency relief damages caused by the 1965 flood totaled about $13.8 million, although additional damages totalling $4.1 million were prevented by existing flood control projects and emergency protective works. The 1966 flood inundated 738,000 acres and inflicted damages, including flood fight costs, of about $14.8 million in the basin despite very successful emergency protective measures at most of the communities. About $9.9 million of urban damages were prevented by the successful flood fight efforts, and existing flood control projects reduced potential damages by about $1.4 million.

The severity of the flooding problem which exists in the Red River Basin was dramatically underscored by events of 1969. (A report on that flood is recorded in another section of this report.)

Drainage

Large portions of the Souris-Red-Rainy region were once covered by a continental glacier. As a result, surface drainage is immature. Much of the land is flat or slightly rolling and poorly drained with broad divides, innumerable potholes, sloughs, and lakes. These conditions cause a major problem in the management of surface water on several million acres of agricultural lands.

In the northern Minnesota portions of the Red and Rainy Basins, extensive bogs and forested

N. Dak. State Water Comm. Photo

A typical drainage ditch - Red River Basin

swamps are intermingled with lakes and smaller areas of wetlands. Most soils are unfit for cultivation but valuable for forestry.

In contrast, the problems of soils on broad lake plains (such as glacial Lake Agassiz) and in shallow potholes are that the water sometimes recedes too slowly if they are to be used for agricultural production. In these soils, wetness and high water table are problems, but drainage works will generally produce immediate benefits in excess of their costs. The removal of surface water provides for normal crop growth in 9 of 10 years.

Agricultural soils with water problems have definite characteristics that determine the economic feasibility of drainage. Excess water reduces yields, increases production costs, and diminishes crop quality by interfering with soil tillage operations and through poor soil aeration. In the broad, flat lake plains, drainage is important, relatively easy to accomplish, and provides monetary benefits in excess of costs. The glaciated pothole areas are for the most part difficult and expensive to drain, and in many cases, drainage is not economically feasible.

A third situation is found in the upland portions of the Red and Souris Basins where glacial potholes and lakes which are of high value to wildlife are intermingled with good agricultural lands. Drainage of potholes to facilitate farming may cause a major conflict of use between wildlife and agricultural interests.

Watershed Management

Combinations of climate, topography and degree of use pose different watershed management problems in the region. In the Red and Souris Basins, agriculture is the major industry with some areas being used exclusively for grazing and others being intensively cultivated. In the Rainy Basin a major source of income is from forest resources. Thus, watershed management varies from those land treatment measures required to maintain and improve the hydrologic conditions on those lands with native vegetation to those required on cultivated land where wind and water erosion and/or water management become a major problem.

Cropland, both irrigated and non-irrigated, makes up about one-half of the region's area. Many of the cropland soils are subject to severe damage from wind erosion unless control measures such as field windbreaks, wind stripcropping, cover crops or crop residue use are established. Other serious problems are water erosion on some soils and slopes as well as water management on the flat, slowly drained soils of the old lakebeds. Although about 50 percent of the cropland is adequately protected from wind and water erosion by existing land treatment measures, there is still severe erosion in the region which is causing soil depletion and reduced water quality.

Soil Conservation Service Photo

PL 566 Watershed & Dam on the Tongue River, northeastern North Dakota

Forest land occupies about 85 percent of the Rainy Basin. Those private and public forest areas provide the raw materials for the pulp industry, which has shown a steady increase during recent years. There is still considerable timber cut for lumber, however this activity is declining. About 65 percent of the Rainy Basin is in public ownership, consisting primarily of the Chippewa and Superior National Forests and several State Forests. These National and State Forests and much of the private woodlands are being managed for multiple use which includes watershed protection.

The forest lands of the Red and Souris Basins are principally in the Minnesota part of the Red

Basin. In North and South Dakota they occur mainly along major streams, in the Turtle Mountains and in the Pembina Escarpment. In North and South Dakota the woodlands are too small to attract a large commercial operation; therefore, only minor use for wood products is made of this resource. Most of these areas are being managed for watershed protection and multiple use.

Although grasslands comprise a relatively small percentage of the region, they play an important part in its economy and a major role in watershed protection. There is a need in much of the region for better range management including such land treatment measures as deferred grazing, proper stocking and the development of well distributed, adequate livestock watering facilities.

Salinity and alkalinity are limiting factors in grass and crop production in several large areas of the Red River Basin. Land use ranges from low order grass to fairly intensive cropping, depending on the degree of salinity or alkalinity and wetness. Many soils in the region are especially susceptible to wind erosion. In addition to the serious depletion of this invaluable resource, wind deposited soils frequently cause additional costs toward maintaining highway ditches, floodway channels, and drainage projects.

Water erosion and sediment damages are moderately severe in all parts of the region. Topsoil losses from eroded areas reduce soil productivity. Sediment deposition in streams and lakes is a major polution problem.

Irrigation

Currently, a relatively small amount of land (approximately 15,000 acres) is under irrigation by private interests in the three-basin region; however, irrigated acreage will expand considerably in North Dakota when construction of the authorized, initial stage of the Garrison Diversion Unit is completed. Of the 250,000 acres included in the initial stage, approximately 198,000 acres are within the study area. The ultimate development proposed for the Garrison Diversion Unit would have, approximately, an additional 580,000 irrigated acres in the region. The Unit will serve a large area afflicted by periodic droughts which have an adverse effect on the economy of the area and State.

Although this new irrigation described above will certainly increase crop yields in the area irrigated, more importantly it will stabilize production, channel production into crops not heavily price-supported, and decelerate the rural-urban migration pattern and the trend to larger farm size. It will provide needed job opportunities both on the farms and in the new agri-business made possible by the expanded cropping pattern typical of irrigated areas, and make available firm, dependable recreation, municipal and industrial water supplies.

Irrigation will allow a more varied, more stable agricultural production on a smaller land area, thus allowing for the preservation of valuable wetland and other ecological features unique to the region.

Within the study area, but not included in either the initial or second stages of the Garrison Diversion Unit, thousands of acres of land are suited for irrigation. Future development of these potential irrigable acres and the water supply systems to maintain them will be accomplished, in all likelihood, on both a project and individual operation basis.

Bureau of Reclamation Photo

Sprinkler Irrigation System in Operation

Municipal and Industrial Water Supply

The current population of the region is estimated to be 716,000. The region is largely rural with few urban areas of more than 2,500 people. Municipal and community water systems serve about one-half of the population with individual and small group systems furnishing the remainder.

Most municipalities which depend upon surface water have constructed storage reservoirs to provide adequate supplies during periods of inadequate stream flow. Some municipal systems use surface water supplemented by ground water, and others depend entirely on ground water.

During normal years stream flows in the Red Basin are adequate but generally inadequate in the Souris Basin. Quantities of water available in the Rainy are largely unevaluated, but probably could be considered unlimited in terms of present-day and foreseeable-future usage.

Water Quality

There is an abundance of water in the Rainy Basin and except below International Falls the quality is good. During normal years the quality of surface water in the Red Basin is satisfactory; however, there is an increasing degradation of quality in the Red River proper. In the Souris Basin water quality is generally acceptable but not good.

Ground water furnishes approximately 25 percent of the water for all consumptive uses. The quality of water withdrawn from sand and gravel deposits is generally satisfactory but that from sedimentary rock sources is generally of poor quality and undesirable for most uses.

Progress is being made in the reduction of the waste loading to the region's waterways from municipal sewage. Progress in abating the industrial, livestock and recreational waste problem is much slower.

Pollution caused by sediment and improperly applied insecticides has resulted in damage to the aquatic environment in local situations.

Recreation

The existing recreation situation in the region is one of great contrast and diversity. There are vast natural water bodies and forests in the Rainy and eastern Red River Basins; whereas natural and man-made lakes with sparse amounts of woodland characterize the Souris and western Red River Basins. There are now some 55 million activity occasions per year in the region.

One indication of an area's capability to provide for quality outdoor experiences is the extent of forest cover. North and South Dakota counties within the Souris and western Red subregions have little natural forest cover, while over half of Minnesota in the eastern Red and Rainy Basins is forested.

The extensive high-quality outdoor recreation setting which exists in the eastern Red and Rainy Basins of Minnesota attracts a large number of non-region residents. Studies conducted by the U. S. Forest Service and Minnesota Health Department show that out-of-state residents represent one-half of the canoeing and resort use of the region's resources. The Forest Service Boundary Waters Canoe Area Studies further establish that over one-half of the State residents using the recreation resources of the Rainy Basin are from out of the region. The proposed establishment of the Voyageurs National Park in the vicinity of Kabetogama Lake, east of International Falls, Minnesota, is currently under consideration. If established, the park would greatly enhance the recreation value of the area. This enhancement will be contingent on providing adequate access facilities.

The recreation resource base of North Dakota counties in the Souris-Red drainage is not as significant in attracting non-region residents as the resource base of Minnesota counties which constitutes the Rainy and eastern Red River Basins. The North Dakota Outdoor Recreation Plan recognizes this fact and states further that out-migration of North Dakota residents on vacation or weekend recreation trips is quite extensive. The State Plan also documents the fact that Minnesota is a primary vacation destination for North Dakota residents.

Forest Service Photo

Canoeing in the Rainy River Basin

The Minnesota and North Dakota Outdoor Recreation Plans indicate a need for additional land acquisition and facility development within the respective states. The Minnesota Plan specifically emphasizes the need for land acquisition in the western part of the State to compensate for increasing land drainage projects. The plan includes an expression of concern that the drainage projects are reducing the number of prairie potholes and other wetlands attractive to migratory waterfowl. The North Dakota Plan does not identify needs within specific geographic areas but does indicate a statewide gap between demand and supply of recreation land and facilities for nine of twelve cited outdoor recreation activities by 1890. Although much of the current recreation use in the Souris-Red-Rainy River Basins depends on natural lakes, streams, marsh areas, and man-made impoundments, greater use will be required and special emphasis will be placed on the location and use of man-made water areas.

Fish and Wildlife

The Souris Basin is rich with natural wetlands, which are of high value for waterfowl production. There are relatively few natural lakes. Nine National wildlife refuges are located in this subregion. These include Des Lacs, Upper Souris, Lower Souris, and six smaller units. Approximately 40,500 acres of water are impounded on these nine refuges for waterfowl management purposes. In addition to ground water and surface water in the form of lakes or streams, there are approximately 42,000 semi-permanent or permanent wetlands, with an estimated 200,000 surface acres in the Souris Basin. An additional area, Short Creek Game Management Area, administered by the North Dakota Game and Fish Department contains 110 acres.

The Red River Basin contains thousands of natural wetlands and numerous large lakes. The Devils Lake area in North Dakota is of National significance as a goose hunting region. The Sheyenne River and Pembina River drainages also include numerous high value wetlands. In the central

or Red River Valley portion the flat valley lands hold little surface water. Along Minnesota's glaciated eastern slope of the basin, topography again permits pothole formation. Numerous wetlands and lakes occur. The eastern portion of the basin is important both for waterfowl and warmwater fisheries. Waterfowl breeding habitat in northwestern Minnesota approximate 225,000 acres and includes the 61,000-acre Agassiz National Wildlife Refuge. The Red Lakes, tributary to the Red Lake River, support an important commercial fishery that has averaged almost 1.2 million pounds annually over the period of 1954 - 1965. In addition to numerous lakes and streams, there are approximately 155,000 semi-permanent or permanent types wetlands, with an estimated 638,000 surface acres in the Red River Basin. There are 24 Federal refuges and two Federal fish hatcheries in the Basin, totaling 50,600 surface acres of water. The Minnesota Department of Conservation manages two areas, the Roseau and the Thief Lake Game Management Areas, with 19,100 surface acres. Seven fish and wildlife management areas administered by the North Dakota Game and Fish Department total 784 surface acres.

The Rainy River Basin is an area with limited relief in the western portions, but heavily glaciated and rich with lakes, streams, and wetlands in the central and eastern portions. Fishing is one of the most important recreational pursuits. Lake trout, walleyes, northern pike and largemouth bass abound in much of the region. Muskellunge are a locally important species. Commercial fishery landings on international lakes, particularly Lake of the Woods, in the Rainy River Basin amounted to 1.7 million pounds in 1965. White-tailed deer and moose are widely scattered throughout most of the basin. The timber wolf—an endangered species in the United States—is still resident to the area. From a fish and wildlife standpoint, water is available in great quantity and there are few shortages except seasonally in some of the streams. In addition to thousands of lakes and many miles of rivers and streams in the Rainy Basin there are vast numbers of natural wetland areas, most of which are extensively used by fish and wildlife--as spawning, nesting, feeding or resting areas. There are an estimated 35,000 wetland areas in the Basin with an estimated total of 112,000 surface acres. Although virtually all surface water in the Rainy River Basin is used in some way for fish and wildlife, relatively few acres are specifically assigned to this use. However, fish and wildlife habitat improvement is an integral part of the management program of the Chippewa and Superior National Forests. There are no Federal wildlife refuges or fish hatcheries in the Basin.

Electric Power

The electric power needs of the region are currently being met by the operation of thermal and hydroelectric plants within the region and importation of power from other regions. There are ten hydroelectric plants in the region with a capacity of 14,325 kilowatts. Seven of these plants are located in the Red Basin and three in the Rainy Basin. Nine of the developments are privately owned and one is publicly owned. The ten plants generate approximately 69,200 megawatt hours of energy annually.

Minerals

The non-metallic mineral industry, principally sand and gravel, is scattered throughout the region with apparent reserves sufficient to meet projected demands. The petroleum industry, in the Souris Basin, has developed during the past 15 years, but unless major discoveries are made it will diminish by 1990. A taconite plant with an initial 4.5 million ton per year capacity is being constructed on the Great Lakes Region-Rainy Basin Divide. The projected capacity of the plant is 13.5 million tons per year. Lignite is used in several thermal electric plants and the lignite reserves in the Souris subregion are extensive.

Transportation

The region is now served by railroads, highways and air transport. The Rainy Basin depends on many small boating facilities to serve the large tourist trade. Commercial navigation in the region is limited to the Lakes of the Woods area.

Good hunting abounds throughout the three-basin region!

THE 1969 FLOOD

General Flooding in the southeast part of Minot, North Dakota (Souris River Basin), 1969

Unusually heavy precipitation during the fall months of 1968 and continuing through the winter provided saturated ground conditions and a heavy snow cover which by mid-February 1969 indicated a serious flood potential, particularly in the headwaters of the Red River basin. Under these conditions communities along the Red River and its several tributaries were warned of the flood danger well in advance of spring snowmelt. As a part of "Operation Foresight", the Corps of Engineers, in cooperation with the State Departments of Civil Defense and other agencies, provided technical assistance, construction equipment with operators, necessary pumps, and necessary supplies to construct and operate local protection works at about 40 communities in the Red River basin and four in the Souris River basin. A major flood was not anticipated or forecast sufficiently early on the Souris River to permit construction of adequate protection works at Minot but other small communities farther downstream were protected.

Maximum stages and discharges attained at key stations in the region are given in the following tabulation:

		1969 flood			*Prior flood of record*		
Location	*Stream*	*Maximum stage (feet)*	*Maximum discharge (cfs)*	*Date*	*Maximum stage (feet)*	*Maximum discharge (cfs)*	*Date*
Wahpeton, N. Dak.	Red	16.35	9,400	10 Apr 69	14.99	7,130	12 Apr 52
					17.0 (a)	11,000(b)	Spring 97
Abercrombie, N. Dak.	Wild Rice	24.54	8,500	11 Apr 69	21.02	5,500	2 Apr 43
Fargo, N. Dak.	Red	37.3	25,300	15 Apr 69	28.79	16,300	16 Apr 52
					39.7 (a)	35,000(b)	7 Apr 97
Valley City, N. Dak.	Sheyenne	17.63	4,500	19 Apr 69	17.51	4,580	28 Apr 48
Halstad, Minn.	Red	38.25	35,300	18 Apr 69	38.50	24,500	17 Apr 47
Hillsboro, N. Dak.	Goose	14.19	7,200	12 Apr 69	14.94	9,420	19 Apr 50
Crookston, Minn.	Red Lake	27.33	28,400	12 Apr 69	25.70	27,400	7 May 50
Grand Forks, N. Dak.	Red	45.69	53,500	16 Apr 69	45.55	55,000	4 Apr 66
					48.5 (a)	80,000(b)	10 Apr 97
Walhalla, N. Dak.	Pembina	14.56	8,300	20 Apr 69	19.2	20,400	17 Apr 62
Emerson, Minn.	Red	87.61	53,500	26 Apr 69	90.89	95,500	13 May 50
Sherwood, N. Dak.	Souris	24.72	12,400	11 Apr 69	23.80	7,400	28 Apr 48
Minot, N. Dak.	Souris	54.50	6,000	19 Apr 69	——	12,000	20 Apr 04
Westhope, N. Dak.	Souris	17.59	6,300	19 Apr 69	16.9	6,400	18 Apr 49

(a) Stage projected to present gauge site and adjusted to present datum
(b) Provisional, based on rating curve extension

The floods in 1969 exceeded maximum stages and discharges of record in many of the streams in the two basins and approached the historical high water elevations in other areas. Urban flood damages prevented totaling about $33,000,000 were attributable to operation of the several existing flood control and watershed protection projects in the basin, the emergency works built with Corps of Engineers assistance under "Operation Foresight", and the independent efforts of local interests. On the Souris River, where adequate advance forecast of the flood was not available, urban damages totaled about $11,500,000 with about $22,500,000 being estimated as damages prevented through local, State and Federal efforts, including operation of the Lake Darling Reservoir by the Bureau of Sport Fisheries and Wildlife. A major evacuation of about 12,000 persons from the floodplain at and near Minot, with military assistance from the Minot Air Force Base and local, State, and Federal co-operation, contributed materially to the reduction in damages in that area.

Crop and other rural area losses were estimated at $22,000,000 and $4,600,000 in Red and Souris River basins, respectively. Railroad and highway damages and associated losses were estimated at about $3,000,000 in the Red River basin and $1,000,-000 in the Souris River basin.

Proposed multiple-purpose reservoirs on the Sheyenne, Wild Rice (Minn.), and Pembina Rivers would have reduced damages in the Red River basin about $8,600,000. A proposed flood control reservoir and channel improvement above, through, and below Minot would have obviated the need for the emergency flood fight and evacuation at Minot and would have prevented practically all of the damages in that area.

The 1969 floods in the Souris and Red River basins demonstrated again that flood control is a major need in these basins. Further, the economic loss of about $29,000,000 in the Red River Basin and other comparable losses in recent years clearly indicate the need for the proposed Type II study in this area.

U. S. Army Corps of Engineers Photo

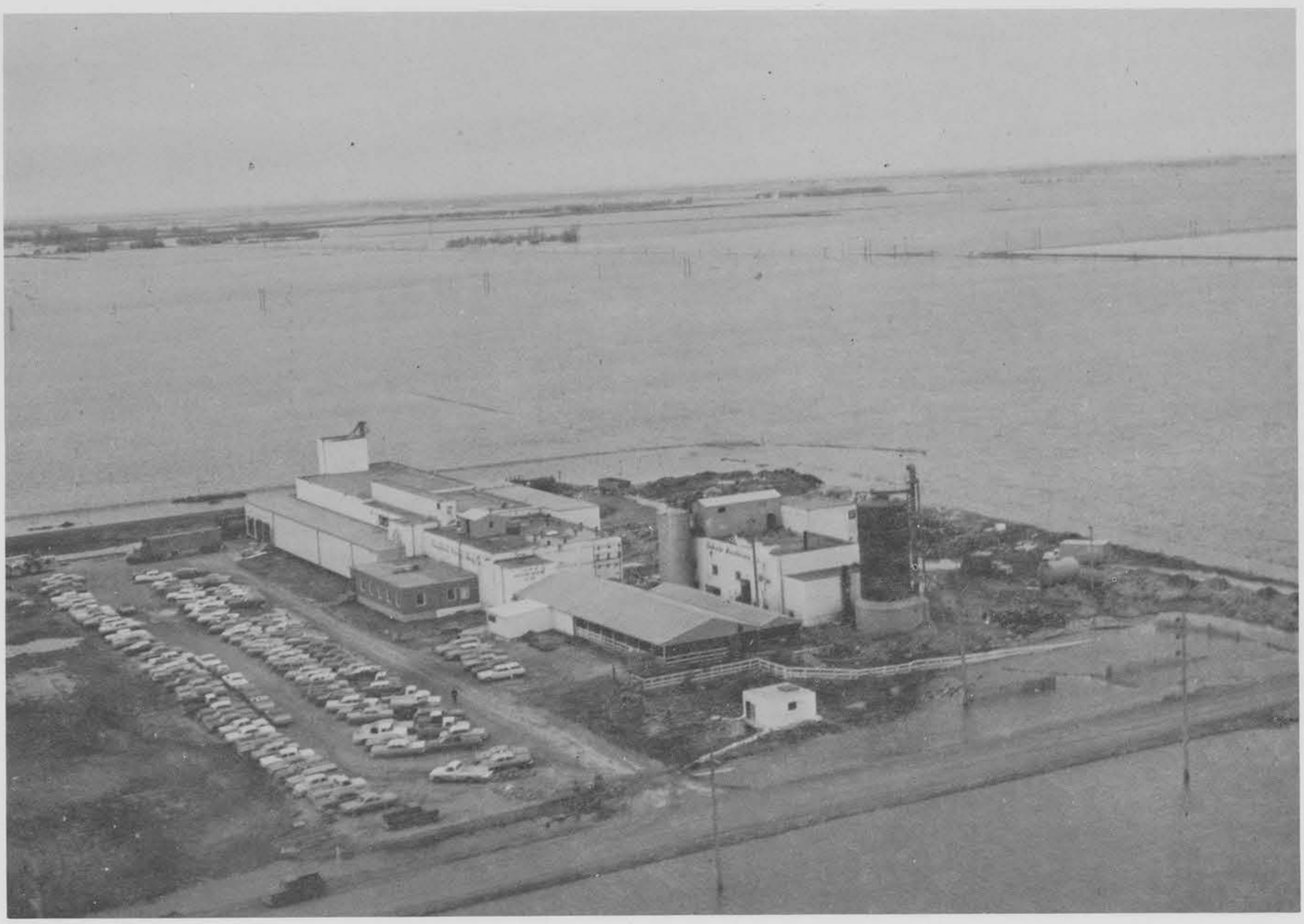
Flooded condition of rural area between Grand Forks, North Dakota, and Oslo, Minnesota - Red River of the North - 1969

U. S. Army Corps of Engineers Photo

Fargo, North Dakota. Ring diked pumping station. Note temporary dike beginning near top of photo

Halstad, Minn. - Dike visible to left in photo

Photo - Corps of Engineers, St. Paul District



West Fargo, North Dakota - Sheyenne River

Photo - Corps of Engineers, St. Paul District

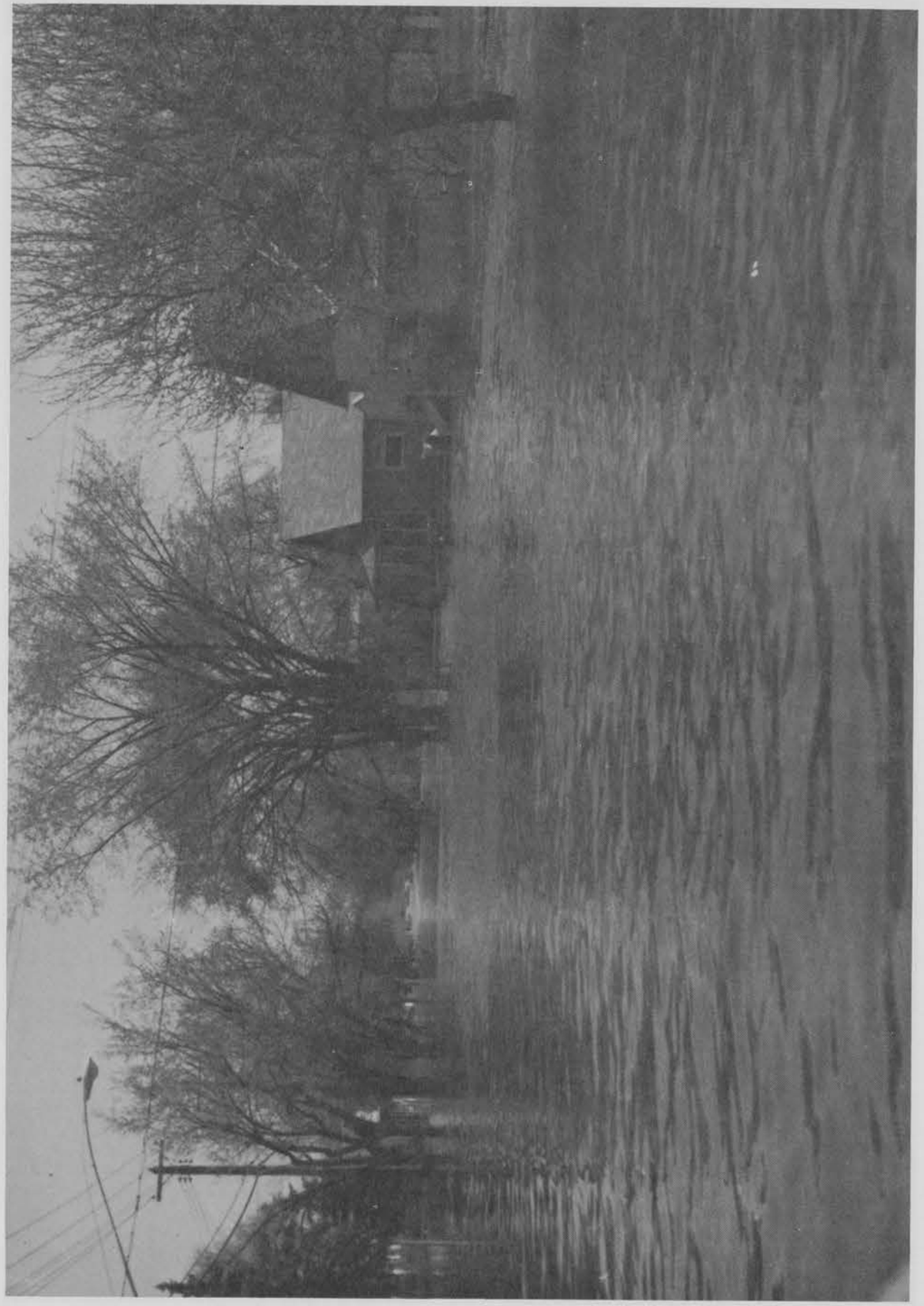
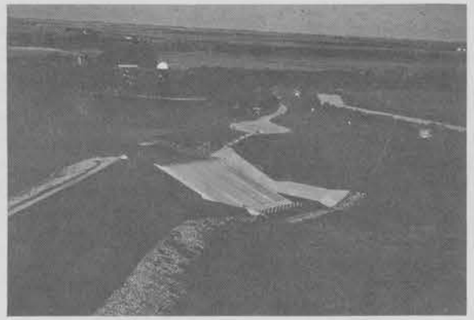


Photo - U. S. Army Corps of Engineers, St. Paul District

Flooding N. E. area of Minot, N. Dak. - Souris River

SCENES THROUGHOUT THE REGION . . .



Homme Dam, Park River, N. Dak.

Baldhill Dam, Sheyenne River, N. Dak.

Commission members and others viewing a construction project

Red Lake River, Minn. - Portion of river which has been improved for flood control

Fish Hatchery below Baldhill Dam

GENERAL STATEMENT
of Commission Goals & Plans for FY 1970

As indicated in the Plan of Study, the general planning policy of the Commission is to formulate a plan, which, if implemented, would not only meet present needs, but would assure that future needs are met as they arise.

Such a plan would propose the methods and/or alternative water conservation, development and management measures needed (1) to reach full employment; (2) to insure the region's participation in its fair share of the national economy; (3) to raise income levels nearer to the National average; (4) to stabilize fluctuations in employment and incomes; (5) to reduce the exodus of people from the region; (6) to preserve and enhance the quality of the environment; and (7) to maintain and promote the well-being of the people.

The principal goal of the Commission during FY 1969 is to complete the Framework Plan. Recent quarterly progress reports submitted to the Water Resources Council state that progress is slightly behind schedule, but that an extension beyond June 30, 1970, will not be needed.

SUBSTANTIVE ACCOMPLISHMENTS
of the Commission to June 30, 1969

Participants in the Souris-Red-Rainy River Basins Comprehensive Study have proceeded, nearly on schedule, with their work assignments. The Plan Formulation and Alternatives Work Group (N) has not been able to move ahead with its principal assignment as expected, because it has frequently found itself preoccupied with rendering administrative and policy decisions. This situation was rectified during the latter part of the fiscal year, when the Commission, acting upon the recommendation of Work Group N, created an Executive Committee whose responsibility is limited to administrative and policy matters. It is anticipated that Work Group N can now proceed at an accelerated rate in discharging its primary plan formulation functions.

The Type I Framework Study, referred to throughout this report, has been advanced to a point where it is readily discernible that the major need for project planning and effective action is located within the Red River Basin exclusive of the Devils Lake, Roseau and Pembina subbasins. As indicated on the map found at the end of this report, the area delineated consists of approximately 32,000 square miles, including minor tributaries. On the basis of a recognized need, the Commission staff prepared a Type II Study proposal of 2 years duration beginning in Fiscal Year 1971 which, if undertaken, would define or evaluate projects and programs in sufficient detail to comprise a basis for authorization or implementation of those projects to be initiated in the next ten to fifteen years, with emphasis being placed on 3 flood control projects, 20 watershed developments and the development of a coordinated reservoir operation plan, to maximize overall benefits for existing and projected projects. A Preliminary Plan of Study containing that proposal was prepared and transmitted to the Water Resources Council for action along with other FY 1971 new starts.

It is anticipated that the Type II Study, if approved, will contribute to the realization of the broad goals and objectives ultimately accepted in connection with the Type I Study and will build upon the direction and guidance emanating from the completed Framework Plan. In doing so, the Type II Study becomes the logical extension of work already begun.

During the period covered by this report, the Commission staff also developed and gained Commission approval of a Glossary and a Data Retrieval System. Wide distribution of both documents has been made to study participants and others.

RELATIONSHIP OF TITLE III PROGRAMS
to State Input

While Title III Programs have contributed significantly to State input to the planning effort of the Souris-Red-Rainy River Basins Commission, inadequate funding has restricted participation, particularly in the case of Minnesota, to auditing Work Group activities, supplying a small amount of data, and attending Selected Work Group meetings.

COMMENTS OF THE COMMISSIONERS
STATE OF MINNESOTA

WILLIAM C. WALTON
Vice Chairman

"We believe that progress in preparing the framework plan appendixes by the work groups is satisfactory. However, progress in plan formulation has been disappointing and is behind schedule. In the plan formulation process, essentially no work has been done concerning investments. Firm decisions have not been made concerning goals, objectives, basic assumptions, criteria and rationale to be used in plan formulation. Unless the rate of progress is greatly accelerated in the next six months the deadline for completion of the framework will not be met.

"Progress in the formulation of a plan of study for type II studies has been satisfactory. However, progress in assigning priorities for investigations, etc., has not been adequate. Difficulties between the U. S. Department of the Interior and the State of Minnesota concerning pollution and irrigation need early resolution.

"Progress in promoting publicity for the Commission's planning activities has not been satisfactory. More extensive use of brochures, conferences and newspapers should be initiated.

"No funds were provided for state agency participation in Basin Commission work groups. However, personnel from state agencies made diligent efforts to attend as many work group meetings as time and agency business permitted.

"In general, coordination problems tended to be resolved as they occurred. However, the knotty problem of differences in planning philosophy between the States of Minnesota and North Dakota remain.

"The 355-page first draft of Souris-Red-Rainy River Basins Commission Appendix M — Part I Legal and Institutional Environments, was prepared and distributed for review. This document constitutes Part I of the Appendix and provides a history of Federal water resources legislation and a summary of present status; a compilation of treaties with Canada and interstate compacts; a list of Federal Agencies with responsibilities in water and related land resources management; a summary of Federal cases which affect development of water and related land resources; a summary of applicable state doctrines as to ownership and/or right of use of water; a list of applicable sections of state constitutions relative to use of water and limitations on debt and financing water development projects; a list of state laws on: use of water, financing projects, establishing agencies or entities empowered to act in the water field, restrictions on power or other development and special water projects or specific bodies of water or streams; a resume of pertinent decisions affecting water and related land resources; condensed versions of important state opinions affecting water resources development; a list of state agencies, boards and entities that have powers and duties affecting development of water and related land resources including the powers and duties of each; state administrative rules which affect resource development; an outline of the aims of the state in the field of water management; a list of state programs in planning and implementing water and related land resources development. Appropriate information contained in similar appendixes of the Upper Mississippi River Comprehensive Basin Study and the Missouri River Comprehensive Basin Study has been collected, processed, updated, and used in this appendix to the maximum practicable extent. Part II of the Appendix will provide examples of local laws affecting development of water and related land resources; and a list of conflicts between Federal and State Agencies and laws, between laws and goals of the respective states, and between agencies' goals, etc. An analysis will be made of water law adequacy and overall consistency, and constraints upon water and related land resource development and management by existing legal and institutional environments will be identified."

STATE OF NORTH DAKOTA

MILO W. HOISVEEN

"The Commission is proceeding at a rapid pace, comparatively, in the preparation of its framework plan. Work now appears to be centered in the areas of greatest concern, which is a stride in the right direction. Cooperation and relationships between members have continued to be excellent. It is hoped that a complete professional staff will be available in the near future to take charge of the planning and ensure that all work is done towards the same goals with the same basis.

"North Dakota has sufficient funds to complete its assigned tasks.

"There is no problem with coordination at top levels. Some problems occur when agencies with an interest in certain areas assign the development of certain phases of the plan to individuals with a restricted view of resource development. This has caused some one-sided viewpoints to be promulgated. Experienced staff members would be invaluable in preventing such from occurring.

"Work Group B — Water Resources. This was an ambitious undertaking for a State, but the work is proceeding on schedule. The material on climate is being developed under contract with the State Climatologist; the material on ground water by the U. S. Geological Survey; and the data on the surface water resources by the North Dakota State Water Commission Hydrologist. All agency requests for data are being met on schedule."

U. S. DEPARTMENT OF AGRICULTURE

CHARLES A. EVANS

"In my opinion, the Commission has continued to make good progress during the past year. The development of the Preliminary Plan of Study and budget estimates for the proposed Type II Study is a case in point. I am concerned, however, about overall progress in the current Type I Study effort. It appears to me that if the study is to be completed on schedule more attention must be given to work group activities to insure they are doing work that is pertinent to the study. In addition, the Plan Formulation and Alternatives Work Group must start on the job of analyzing the present status of water and related land development and determining the needs for the future. They must become productive soon if deadlines are to be met.

"Funds available to USDA for participation in the study during the 1969 fiscal year were adequate. The budget recommendations appear to be sufficient for the 1970 fiscal year; however, we do not know what the final appropriation will be or the kind or extent of limitations that may be imposed by Congress, the Bureau of the Budget, or others.

"Following is a brief report of the progress made by Work Groups "C" and "E":

1. Work Group "C" is slightly behind schedule; however, expected inputs from ERS and FS will enable them to catch up. Sections A and B of the outline are complete. Sections C and E, with minor revisions, are essentially complete. It is anticipated that the appendix draft will be ready for review no later than September 15.
2. Work Group "E" is also slightly behind schedule; however, coordination with Work Group "D" is needed to maintain the schedule. A joint meeting of the two work groups will be arranged in the near future. The work group should be on schedule by mid-September, and expects to meet scheduled submission dates from then on."

U. S. ARMY CORPS OF ENGINEERS

COL. RICHARD J. HESSE

"During fiscal year 1969 the Commission and its supporting study groups have become a more effective vehicle for planning and coordinating water resources development and management in the region. This has been evidenced by cooperative working relations established among the participating State and Federal agencies. The 1965 Water Resources Planning Act recognizes that meaningful collaborative planning requires consensus. Consequently, the Commission must adhere to this concept despite the difficulties and frustrations involved. Although the planning activities of the Commission were slowed by the flood this spring, I am sure that my successor will work closely with you to accelerate progress on the framework study.

"The Corps of Engineers budget has been adequate to cover all assigned studies.

"To date we have experienced no difficulties related to interagency coordination.

"Work Group 'D' Progress follows:

(1) Nearly a year ago Work Group D, along with the other functional work groups, submitted to Work Group N preliminary reports covering the flood and other water related problems of the basins. Also submitted were statements describing proposed procedures for translating economic projections into estimates of future flood damages or resource needs. These reports enabled Work Group N to develop necessary guidance for each of the functional work groups covering the scope of data collection and required analyses. The Commission staff has proposed a Type 2 study of the Red River basin after reviewing statements from each work group recommending, from the standpoint of its functional area, the potential projects and programs for development and management of water and related land resources which should be evaluated under a Type 2 study.

(2) Work items pertaining to the delineation of the floodplains and damage reaches, flood damage reconnaissance, the evaluation of present flood damages and the determination of effects of authorized and planned projects have essentially been completed this fiscal year. Representatives from the Soil Conservation Service and the Corps of Engineers met during the week of 13 to 17 January 1969 to formulate single-purpose flood damage reduction measures. Subsequently, a work group meeting was held on 3 March 1969 to review formulation studies, determine criteria for programming future flood damage reduction measures, and decide on the presentation and content of written material for the appendix. The flood control program formulation effort is about 80 percent complete to date. Remaining work will involve developing a time schedule for accomplishing future flood damage reduction measures in accordance with the criteria developed during the 3 March 1969 work group meeting. Flood damage projections are approximately 90 percent complete. Projections for urban flood damages are complete but agricultural flood damages are being delayed until Work Group A furnishes final projection indexes for the value of crops in the study area.

(3) Drafting of descriptive portions of the appendix is approximately 60 percent complete. Work group members were requested to furnish drafts of appendix material by 15 April 1969 wtih a view toward completing a preliminary draft 2 or 3 months ahead of the scheduled completion date. However, a heavy work load associated with the 1969 flood emergency and postflood activities delayed all work on the appendix. Consequently, it is estimated that a preliminary draft will not be completed until 1 or 2 months after the scheduled date of 1 September 1969.

"We regret the delay in our progress caused by diverting personnel to flood emergency and postflood activities. However, we plan to now accelerate our study effort to recover as much slippage as possible."

U. S. DEPARTMENT OF HEALTH EDUCATION & WELFARE

"In my opinion, the Commission's activities in Fiscal Year 1969 were well conducted and beneficial. The material presented during the year was interesting and most beneficial to the Commission members in the preparation of their various appendixes for the Framework Study.

"The DHEW budget support was adequate for our activities during Fiscal Year 1969.

(Photo not available)

"The coordination between the various agencies was very good and no difficulties were experienced.

"The preparation of the chapter on Municipal, Industrial and Miscellaneous Water Requirements and Health Aspects is somewhat behind schedule. An engineer was scheduled to report to the Regional Office in May, 1969. It is anticipated that this engineer will be able to complete work on the chapter which is partly finished."

T. C. FERRIS

U. S. DEPARTMENT OF INTERIOR

HARRELL F. MOSBAUGH

"The Commission has made satisfactory progress during the past fiscal year in carrying out its responsibilities. It is apparent that some unnecessary effort was devoted to considering a second stage study for the Red River Basin. Unnecessary time was devoted to preparing a priority list of program elements, in view of the fact that little or no use apparently will be made of that information. Time devoted to a potential second stage study and compilation of program elements might have been more profitably utilized in applying this effort to the current type 1 study.

"With minor exceptions, Interior bureaus involved in Commission activities had adequate funds to carry out their responsibilities during the fiscal year.

"Minor difficulty was encountered by Department of the Interior work group chairmen in obtaining some information from State agencies. I believe this was primarily due to the regular program workloads of those entities and from budget constraints.

"Each of the five work groups chaired by Interior Personnel have advanced their assignments in accordance with a predetermined schedule of activity. Some delays were encountered by the Recreation and Preservation Work Group due to the high priority of other comprehensive studies involving the same personnel.

"It is suggested that the Commission staff devote unlimited attention to advancing all elements of the type 1 study in accordance with the time schedule set forth in the Plan of Study."

U. S. DEPARTMENT OF TRANSPORTATION

GEORGE H. SEAWORTH

"I believe the Commission has continued satisfactory progress toward development of a comprehensive plan for the development of the water and related land resources of the basins. It has fully discharged its duties outlined in Section 201 of Public Law 89-88 within the staffing capabilities of the commission and the support of the members. The one area where I believe we may have been reluctant to assume full responsibility in is outlined in sec. 201(b)(1). This responsibility requires the commission to serve as the principal agency for the coordination of all other plans for development of water and related land resources in the area. Knowing that planning by all State, Federal and local governments, as well as non-government agencies, will not stand still until the commission has developed a comprehensive plan, we should be prepared to give our advice or comments on individual plans during the interim period. I find that we as a Commission have been reluctant to endorse or comment on individual agency plans, such as Pembilier Dam, Kindred Dam, etc.

"Department of Transportation has not experienced any budgetary constraints to date for our limited activity.

"The two principal agencies within Department of Transportation, U. S. Coast Guard and the Bureau of Public Roads, have had no coordination problems. When requested, we have received assistance from the Department."

FEDERAL POWER COMMISSION

LENARD B. YOUNG

"I believe that the Commission has progressed fairly well in the discharge of its responsibilities. However, a great deal of time has been spent in discussions as to the possible future Type II Study and I believe that this has detracted from the primary mission of the Commission to produce a Type I Study. However, the overall result in the end may be on the plus side.

"Budgetary constraints have not limited this agency or the Power Work Group in completion of our assigned task or participation in Commission affairs.

"There have been no problems relative to agency coordination insofar as the Federal Power Commission is concerned.

"Appendix L, Power, for the Comprehensive Study has been completed in draft form and a meeting to discuss the report was scheduled for July 16. The report preparation is approximately three months ahead of schedule."

FRANCIS D. FISHER
Dept. of Housing & Urban Development

DR. WALTER P. THORESEN
Dept. of Commerce

Eide, Helmeke, Boelz & Pasch

CERTIFIED PUBLIC ACCOUNTANTS

Members American Institute of Certified Public Accountants

FARGO, NORTH DAKOTA

To: Souris-Red-Rainy River
Basins Commission
Moorhead, Minnesota

We have examined the statement of assets and fund balance (Exhibit A) of the Souris-Red-Rainy River Basins Commission of Moorhead, Minnesota, as of June 30, 1969, (on a cash basis) and the related statements of cash receipts and disbursements (Exhibit B) and changes in the fund balance (Exhibit C) for the year then ended. Our examination was made in accordance with generally accepted auditing standards and accordingly included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances, except as explained in the following paragraph.

All disbursement vouchers are prepared and submitted to the United States Treasury Department, Division of Disbursement, for payment. The cancelled checks relating to these disbursements are retained at the Treasury Department and as such were not available for our examination.

In our opinion, except for the effect of any adjustments which may have been disclosed had we been able to examine cancelled checks as explained in the above paragraph, the accompanying financial statements present fairly the assets and fund balance of the Souris-Red-Rainy River Basins Commission of Moorhead, Minnesota, at June 30, 1969, resulting from cash transactions, and the recorded cash receipts and disbursements and changes in the fund balance for the year then ended.

Eide, Helmeke, Boelz & Pasch

August 6, 1969

SOURIS-RED-RAINY RIVER
BASINS COMMISSION
MOORHEAD, MINNESOTA

REPORT ON EXAMINATION
FOR THE YEAR ENDED
JUNE 30, 1969

Exhibit A

SOURIS-RED-RAINY RIVER BASINS COMMISSION
MOORHEAD, MINNESOTA

STATEMENT OF ASSETS AND FUND BALANCE
JUNE 30, 1969

ASSETS		
Cash on Deposit with the U. S. Treasury Department (Exhibit B)	$ 164,020.00	
Office Furniture and Equipment - at Cost	9,840.87	
Total assets		$ 173,860.87
FUND BALANCE		
Fund Balance (Exhibit C)		$ 173,860.87

Exhibit B

SOURIS-RED-RAINY RIVER BASINS COMMISSION
MOORHEAD, MINNESOTA

STATEMENT OF CASH RECEIPTS AND DISBURSEMENTS
FOR THE YEAR ENDED JUNE 30, 1969

Cash Receipts:			
State assessments:			
Minnesota State Planning Agency	$ 27,356.63		
North Dakota Water Commission	54,713.25	$ 82,069.88	
Federal grants:			
Water Resources Council		82,000.00	
Total receipts			$ 164,069.88
Cash Disbursements:			
Salaries and taxes:			
Professional salaries	$ 37,867.29		
Office salaries	6,184.64		
Payroll taxes	1,490.99	$ 45,542.92	

Exhibit B (Continued)

Fees, travel, and services:		
Meals and lodging	$ 813.47	
Commercial transportation	2,013.50	
Vehicle mileage	532.20	
Office rental	6,337.50	
Commission meeting expense	38.51	
Equipment rental	1,454.05	
Postage and telephone	1,267.39	
Equipment repair	135.25	
Legal and accounting	762.00	
Consulting fees	120.00	
Dues and memberships	19.20	
Insurance	143.00	
Employee moving expenses	1,551.61	
Miscellaneous services	45.88	15,233.56
Supplies:		
Office supplies	$ 1,730.27	
Books, maps and subscriptions	570.56	
Printing	2,091.95	4,392.78
Capital outlay:		
Office furniture and equipment		1,007.79
Total disbursements		66,177.05
Excess of Cash Receipts over Cash Disbursements (Exhibit C)		$ 97,892.83
Cash Balance, July 1, 1968		66,127.17
Cash Balance, June 30, 1969 (Exhibit A)		$ 164,020.00

Exhibit C

SOURIS-RED-RAINY RIVER BASINS COMMISSION
MOORHEAD, MINNESOTA

STATEMENT SHOWING CHANGES IN FUND BALANCE FOR THE YEAR ENDED JUNE 30, 1969

Fund Balance, July 1, 1968		$ 74,960.25
Add:		
Capital outlay for office furniture and equipment	$ 1,007.79	
Excess of cash receipts over cash disbursements (Exhibit B)	97,892.83	98,900.62
Fund Balance, June 30, 1969 (Exhibit A)		$ 173,860.87

THE WHITE HOUSE

EXECUTIVE ORDER

No. 11359

ESTABLISHMENT OF THE SOURIS-RED-RAINY RIVER BASINS COMMISSION

WHEREAS the Water Resources Planning Act (hereinafter referred to as the Act, 79 Stat. 244, 42 U.S.C. 1962 *et seq.)* authorizes the President to declare the establishment of a river basin water and related land resources commission when a request for such a commission is addressed in writing to the Water Resources Council (hereinafter referred to as the Council) by the Governor of a State within which all or part of the basin or basins concerned are located and when such a request is concurred in by the Council and by not less than one-half of the States within which portions of the basin or basins concerned are located; and

WHEREAS the Council, by resolution adopted December 28, 1966, concurred in the requests of the Governors of the States of Minnesota and North Dakota to which the Governor of South Dakota has given his concurrence, and did itself request that the President declare the establishment of the Souris-Red-Rainy River Basins Commission under the provisions of Section 201 of the Act; and

WHEREAS the Governors of the States of Minnesota and North Dakota have concurred in, conditions relating to consolidation and termination of this Commission; and

WHEREAS the requests of the Governors of the States of Minnesota and North Dakota and the resolution of the Council of December 28, 1966, together with written concurrence by the Governor of South Dakota, satisfy the formal requirements of section 201 of the Act; and

WHEREAS the Governor of the State of Montana has been consulted in regard to the small headwater area of the Souris River Basin in Montana that contributes a small quantity of water to the area of jurisdiction of the commission; and

WHEREAS it appears that it would be in the public interest and in keeping with the intent of Congress to declare the establishment of such a Commission;

NOW, THEREFORE, by virtue of the authority vested in me by section 201 of the Act, and as President of the United States, it is ordered as follows:

SECTION 1. *Souris-Red-Rainy River Basins Commission.* It is hereby declared that the Souris-Red-Rainy Rivers Basin Commission is established under the provisions of Title II of the Act.

SEC. 2. *Jurisdiction of the Commission.* It is hereby determined that the jurisdiction of the Souris-Red-Rainy River Basins Commission referred to in section 1 of this order (hereinafter referred to as the Commission) shall extend to those portions of the States of Minnesota, North Dakota, and South Dakota that are drained by the Souris-Red-Rainy Rivers system, in accordance with the requests of the Governors of Minnesota and North Dakota, concurred in by the Governor of South Dakota, and in accordance with the resolution of the Council.

SEC. 3 *Membership of the Commission.* It is hereby determined that, in accordance with section 202 of the Act, the Commission shall consist of the following:

Executive Order (Continued)

(1) a Chairman to be appointed by the President.

(2) one member from each of the following Federal departments and agencies: Department of Agriculture, Department of the Army, Department of Commerce, Department of Health, Education, and Welfare, Department of Housing and Urban Development, Department of the Interior, Department of Transportation, and the Federal Power Commission, such member to be appointed by the head of each department or independent agency he represents.

(3) one member from each of the following States: Minnesota, North Dakota, and South Dakota, and

(4) one member from each interstate agency created by an interstate compact to which the consent of Congress was given and whose jurisdiction extends to the waters of the area specified in section 2.

SEC. 4 *Functions to be performed.* The Commission and its Chairman, members, and employees are hereby authorized to perform and exercise, with respect to the jurisdiction specified in section 2 of this order, the functions, powers, and duties of such a Commission and of such Chairman, members, and employees, respectively, as set out in Title II of the Act.

SEC. 5 *Consultation with adjoining States.* The Commission is expected to provide for procedures for consultation with the State of Montana on any matter which might affect the water and related land resources of the small headwater drainage of the Souris River in Montana, and to give notice to Montana of meetings of the Commission.

SEC. 6 *International coordination.* The Chairman of the Commission is hereby authorized and directed to refer to the Council any matters under consideration by the Commission which relate to areas of interest or jurisdiction of the International Joint Commission, United States and Canada. The Council shall consult on these matters as appropriate with the Department of State and the International Joint Commission through its United States Section for the purpose of enhancing international coordination.

SEC. 7 *Consolidation and termination.* Consideration shall be given to consolidating the Commission with a Missouri River Basin Commission, if and when such a commission is established. If a consolidation does not occur, the Commission shall terminate within six months after the submission of the comprehensive river basin plan in accordance with section 204(3) of the Act, or on June 30, 1972, whichever is earlier; unless, upon recommendation of both the Council and not less than one-half of the number of member States, this order is extended.

SEC. 8. *Reporting to the President.* The Chairman of the Commission shall report to the President through the Council.

LYNDON B. JOHNSON

THE WHITE HOUSE,
June 20, 1967

ALTERNATE COMMISSION MEMBERS

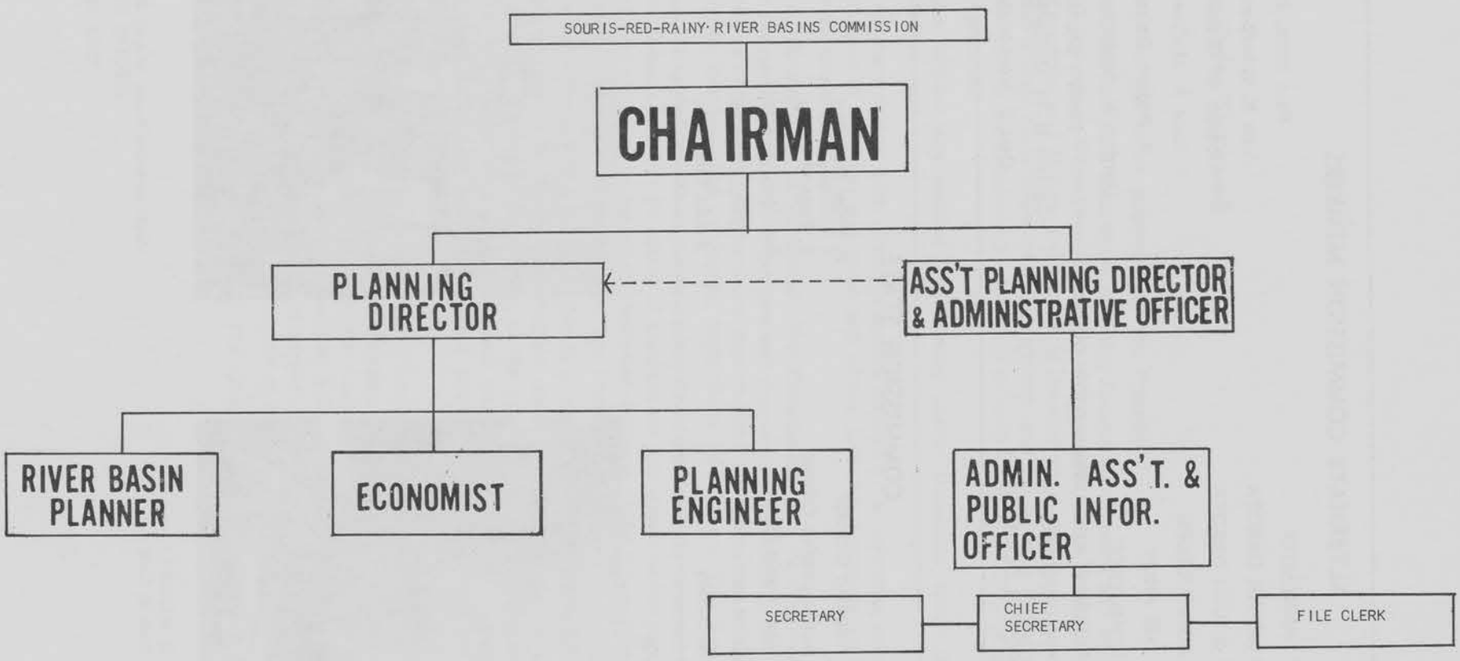
STATE OF MINNESOTA	Paul Horn, Jr.
STATE OF NORTH DAKOTA	Alan K. Grindberg
STATE OF SOUTH DAKOTA	Joseph W. Grimes
DEPT. OF AGRICULTURE	Neal A. McClure
DEPT. OF THE ARMY	J. Robert Calton
DEPT. OF COMMERCE	Gordon W. Miklethun
DEPT. OF HOUSING AND URBAN DEVELOPMENT	Edward Bruder
DEPT. OF TRANSPORTATION	Captain M. H. McGarity
FEDERAL POWER COMMISSION	Orel E. Haukedahl

COMMISSION STAFF

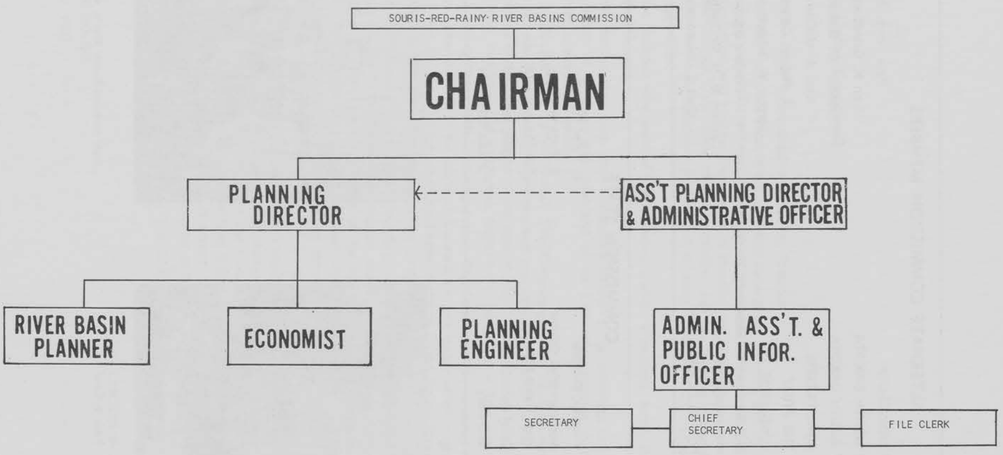
Planning Director	H. Peter Odegard
Administrative Officer	E. Eugene Krenz
River Basin Planner	Stanley J. Wentz
Chief Secretary	Carol Leibhan
Secretary	Paula Stenglein

The Girls - Paula & Carol

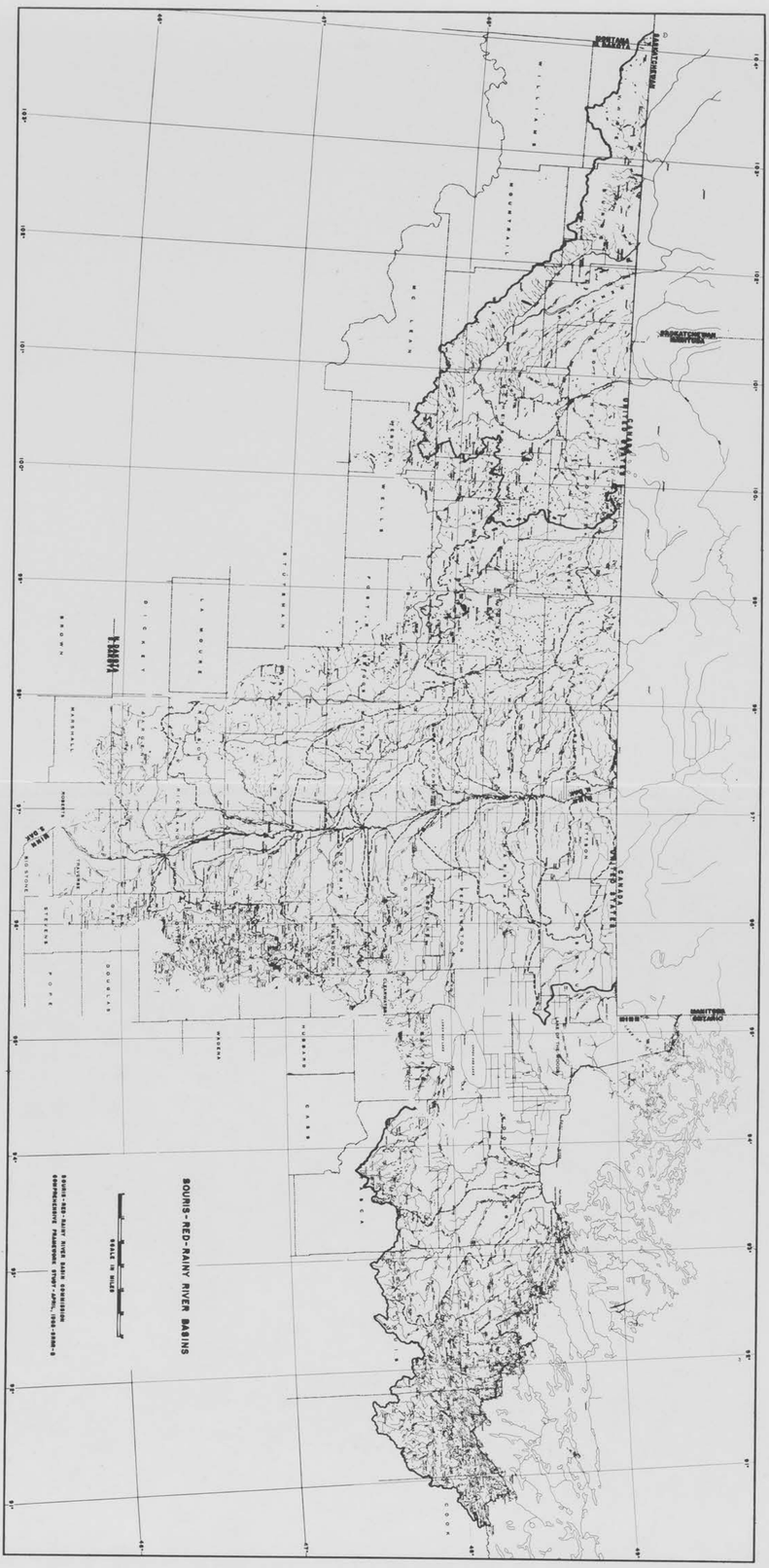
Staff Members Krenz, Wentz, & Odegard



SRRRBC-AUG. 1969



SRRRBC-AUG. 1969



a new approach

Partnership in Planning

- POLLUTION
- PURIFICATION
- POTABILITY

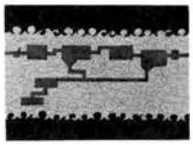
SOURIS-RED-RAINY
RIVER BASINS COMMISSION
Holiday Mall - Professional Center - Suite No. 6
Moorhead, Minnesota 56560

EVERY AMERICAN SHOULD SEE THIS FILM ABOUT WATER...

Our most important natural resource

(1969?)

"It's Your Decision CLEAN" WATER

An up-to-the-minute report on the nation's water crisis. The effect of more people  prosperity  products  in the 20th century has resulted in a lack of usable water. This film shows how secondary sewage treatment  will help provide adequate supplies of clean water for communities of all sizes  for recreation  and for industry. 

Now is the time for  citizens everywhere to support  clean water programs and to vote  for modern sewage treatment.

Of particular interest to...

Conservationists

Civic and Service Clubs

Garden Clubs

Educators

Women's Clubs

Governmental Agencies

Water Pollution & Environmental Health Groups

Television Audiences

16MM | 14½ MINUTES | COLOR | ANIMATION | FREE-LOAN

"IT'S YOUR DECISION—CLEAN WATER"

Presented by
THE SOAP AND DETERGENT ASSOCIATION and
THE LEAGUE OF WOMEN VOTERS OF THE UNITED STATES

Produced by
WILDING, INC.

Distributed by
ASSOCIATION FILMS, INC.

REGIONAL FILM CENTERS
600 Grand Avenue, **Ridgefield, New Jersey 07657**
561 Hillgrove Avenue, **La Grange, Illinois 60525**
1621 Dragon Street, **Dallas, Texas 75207**
324 Delaware Avenue, **Allegheny County, Oakmont, Pennsylvania 15139**
25358 Cypress Avenue, **Hayward, California 94544**

ORDER FORM for free-loan use

Please send me the 16mm *free-loan* film, "It's Your Decision—Clean Water."

1st Date _____ Alternate Date _____ Alternate Date _____

☐ If the film is not available on the dates indicated, please schedule it for the first open date.

NAME _____

TITLE _____

ORGANIZATION _____

ADDRESS _____

CITY _____ STATE _____ ZIP CODE _____

TO ORDER: Mail this coupon to the Regional Film Center nearest you.

PRINTED IN U.S.A.

PRESENTED AS A PUBLIC SERVICE BY
THE SOAP AND DETERGENT ASSOCIATION AND
THE LEAGUE OF WOMEN VOTERS OF THE UNITED STATES WITH THE
TECHNICAL ASSISTANCE AND GUIDANCE OF THE PUBLIC HEALTH
SERVICE AND THE FEDERAL WATER POLLUTION CONTROL
ADMINISTRATION, U.S. DEPARTMENT OF HEALTH, EDUCATION,
AND WELFARE.

It's Your Decision

CLEAN WATER

League of Women Voters
of the United States

Memorandum

1200 17th Street, N. W. - Washington, D. C. 20036

March 27, 1969

To: State and Local League Presidents (with copy for State and Local League Treasurers)

From: The National Office

Re: How to Handle 50th Anniversary Income received Between April 1, 1968 and March 31, 1969 When Filing Form 990.

PLEASE PASS THIS MEMO ON TO YOUR TREASURER IMMEDIATELY.

During the fiscal year 1968-69 local Leagues will have received contributions for the LWVUS 50th Anniversary Drive. This memo advises treasurers how to handle 50th Anniversary income when filing Form 990. For general instructions in filing Form 990 read "A Guide For The Local League Treasurer" pp 37-44.

Generally speaking, the local League will fill out Form 990 as usual. Any contributions received in its regular 1968-69 annual finance drive held between April 1, 1968 and December 31, 1968, will be accounted for under the income item (3) for "contributions, gifts, grants," etc. and (see instruction 5, p. 42) any gift of $100 or more received in the regular finance drive must be listed on an itemized schedule attached to the form.

50th Anniversary income will be handled differently. The only 50th Anniversary gift income which the local League will report on Form 990 is that portion of the 125% (representing the direct share local Leagues will retain from the Campaign) which they have received and banked locally between January 1, 1969 and March 31, 1969. A lump sum representing this amount will be included in the item (3) contributions, gifts, grants, etc. However, it will not be necessary for the local League to itemize any 50th Anniversary gifts of $100 or more. Instead they should list on the itemized schedule only the lump sum and mark it as a gift from the LWVUS Anniversary Fund.

Do not include in the lump sum from 50th Anniversary contributions any advance special gifts given directly to the Campaign headquarters. Do not include in the lump sum any gifts given to the Education Fund or the Overseas Education Fund. List only that portion of the 125% received and banked locally before March 31, 1969, which your local League retains locally. If the entire 125% has not been received by March 31, the remaining portion will be reported on Form 990 for fiscal 1969-70.

Reporting income from the 50th Anniversary Drive in this fashion is made possible because a national report itemizing gifts over a certain amount will be filed by the LWVUS, the LWV Education Fund and the Overseas Education Fund.

League of Women Voters
of the United States

Memorandum

1200 17th Street, N. W. - Washington, D. C. 20036

This is going on
Duplicate Presidents Mailing
April 10, 1969

TO: Local and State League Presidents
For Water, Public Relations and Publications Chairmen

FROM: National Office

RE: New League Water Publications

What can John Q. Citizen do about water pollution? What has Congress done about water problems?

The answers to both questions can be found - where else? - in League publications, in this case two new ones: So You Want To Do Something About Water Pollution and Summing Up Water Legislation in the 90th Congress (Water Resources Current Review #5).

So You Want To Do Something About Water Pollution is unique in that it tells the average person exactly what he can do - as an individual and as part of a group. There are plenty of materials describing what the water problems are, but there's not much available that tells the man on the street what he can do! So You Want To Do Something fills this very real need. And it sells for only 20 cents a copy!

Schools, study groups, civic officials, water experts, conservation groups, community planners, clubs, church groups and others will want to buy this one...many groups will want to order it in quantity to distribute to their own members. Why not send a complimentary copy to club presidents and key people?

And bring it to the attention of your town's news media, too...tailor the sample news release to your own needs...suggest that your paper write an editorial based on the pamphlet.

For League members, unit meetings on water are ideal places to sell the new booklets, and why not sell them at other meetings too, so your League's members can bone up in advance? Put a notice in your next bulletin - quoting freely from the sample news release if you like.

The Current Review, sent out in March, describes what happened in the 90th Congress and what did not regarding bills affecting oil, vessel and mine drainage pollution; new methods for stemming pollution of our lakes; water quality under contracts, permits, licenses and leases; the National Water Commission; the estuary inventory and study, and similar water bills of interest to the League and to others. All this for only 50 cents!

People are thirsting for water facts! Fill 'em up!

# # #

League of Women Voters of the U.S.
1200 - 17th Street, N. W.
Washington, D. C. 20036

This is going on Duplicate Presidents Mailing
April 8, 1969

SAMPLE NEWS RELEASE

What can I do about water pollution in my town?

What is Congress doing about water problems in general?

The answers to both questions can be found in two new pamphlets published by the League of Women Voters.

So You Want To Do Something About Water Pollution tells the average citizen what steps to take, as an individual and as part of a group, to clean up the water in his community. A 12-page booklet which sells for 20 cents, it shows the layman how he can investigate his area's water situation, map out a plan for achieving results, and work with others to take the necessary steps to get something done.

Summing Up Water Legislation in the 90th Congress (Water Resources Current Review #5) describes the Congressional action taken on oil, vessel, and mine drainage pollution, the National Water Commission, estuary inventory and study, the national scenic river system, and other legislation. Copies of the 16-page booklet are 50 cents.

The booklets are the latest in the series of widely-read League publications on water problems, which include the popular pamphlets, Population + Production = Pollution, and Who Pays for a Clean Stream? The new publications may be ordered from the League of Women Voters of _____ (your League), _____ (address) (name and address of person if necessary), _____ (phone).

(Here it is suggested you write a paragraph or two about your own League's work in water resources in your own area or your own water publications if you have some.)

# # #

League of Women Voters of Minnesota, 555 Wabasha St., St. Paul, Minnesota
April 1969

Statement made by Mrs. O. J. Janski, President,
League of Women Voters of Minnesota before the Pollution Control Agency, April 17, 1969

I am Mrs. O. J. Janski, President of the League of Women Voters of Minnesota. We wish to speak to you today in support of the enforcement of the water quality standards which have been set up for the State of Minnesota and against the granting of variances from these standards.

When the Water Quality Act of 1965 was signed into law by President Lyndon Johnson, he stated "The clear, fresh waters that were our national heritage have become dumping grounds for garbage and filth. They poison our fish, they breed disease, they despoil landscapes. No one has a right to use America's rivers and America's waterways that belong to all the people as a sewer . . . There is no excuse for a river flowing red with blood from slaughterhouses. There is no excuse for paper mills pouring tons of sulphuric acid into the lakes and the streams of the people of this country. There is no excuse - and we should call a spade a spade - for chemical companies and oil refineries using our major rivers as pipelines for toxic wastes. There is no excuse for communities to use other peoples' rivers as a dump for their raw sewage. This sort of carelessness and selfishness simply ought to be stopped; and more, it just must be reversed. And are we going to reverse it." That statement was made in 1965. We have fortunately moved toward some improvement since that time.

However, at the last hearing of the Federal Water Pollution Control Administration. Mr. Badalich said that 60% of the polluters on those parts of the Mississippi and Minnesota Rivers being considered here had either begun to clean up or had concrete plans to do so. The twelve remaining polluters, according to Mr. Murray Stein of the FWPCA, were among the largest polluters originally cited by them. Their combined wastes reached totally unacceptable levels.

We wish to state today that we are emphatically in favor of conformingto the federal standards, with no variances. There is no excuse for these municipalities and industries to continue to throw their refuse into our water.

We appreciate what may be required to meet these standards in terms of research, experimentation and innovation. But we must insist that the goal be maintained.

We believe that pollution control is the cost of doing business, and we are prepared to work toward public acceptance of that cost. The members of this agency must be aware, as we are, of the great body of public opinion which supports this view.

As we stated to this Agency, April 8, Minnesota is fortunate in standing at the headwaters of the Mississippi. We receive our water pure. We have no clean-up problem except for what we ourselves produce. Of all states our water quality should be the easiest to guarantee. We have a social responsibility to send our water on to other states containing as few poisons as possible.

In Mr. Hickel's recent press statement, he said he favors "gradually upgrading clean water standards until such now polluted rivers as the Hudson and the Potomac flow as pure as mountain streams." "I think possibly in a period of ten years that could be obtained," President Johnson said in 1965 that they were going to reopen the Potomac for swimming in 1975. We dream of seeing the Mississippi River reopened for swimming in the Twin Cities. That cannot possibly happen to the water in Minnesota in ten years unless the Pollution Control Agency enforces the standards that now exist.

League of Women Voters of Minnesota, 555 Wabasha Street, St. Paul, Minnesota 55102

Testimony given by Mrs. William Brascugli, Water Resources Chairman, League of Women Voters of Minnesota, at the Lake Superior Enforcement Conference, May 13, 1969, Hotel Duluth, Duluth, Minnesota

I am Mrs. William Brascugli, Water Resources Chairman of the League of Women Voters of Minnesota. I am also representing Mrs. Thomas Irvine, Water Resources Chairman of the League of Women Voters of Michigan.

The League of Women Voters of the United States has studied the use and preservation of the nation's water resources since 1956. It is our belief that it is becoming increasingly important for water users to discharge water in as much the same condition as it was withdrawn as is possible. Two years ago local Leagues across the country in 1,250 communities expressed to the national Board their conviction that the pollution of our waters must be controlled. They agreed 1) that control of wastes should be considered one of the costs of production and 2) that new industrial plants, from the beginning of their operation, should be required to meet high water quality standards without financial aid from federal funds. When an industry is unduly penalized with relation to its competitors by undertaking to clean up present operations, we have supported government aid where necessary. When pollution control occasions a greater cost to the consumer, we are prepared to work toward public acceptance of that cost.

We appreciate the value of commitment on the part of local and state governments to set and maintain the highest possible standards. But we also recognize the fact that powerful political and industrial interests may exert strong pressures, making it difficult to enact and carry out pollution abatement programs on the state and local level. For this reason, we believe that the federal government has an important role to play in protecting the broadest public interest when state or local efforts fail. Certainly the quality of the water in Lake Superior should be a matter of interstate, and even international concern. How well we take care of Lake Superior, perhaps our most beautiful natural resource, will affect the future of at least three states and Canada.

The economic development of Lake Superior is just beginning. Plans are being made for more extensive tourist business, for increased taconite production, for a gaseous diffusion plant on the Knife River by the Atomic Energy Commission, and for the prospect

of extensive copper-nickel production in northern Minnesota. There is even talk of a canal connecting Lake Superior with the Mississippi River. If we do not set and enforce high standards, Lake Superior is certain to be destroyed. Furthermore, because of the low rate of turnover of Lake Superior water (90% turnover in 500 years), unlike that of the other Great Lakes, the destruction will be practically irreversible.

For these reasons we urge:

1. That all industries and municipalities now dumping into Lake Superior be immediately and thoroughly evaluated.

2. That the burden of proof be placed upon the industry or municipality. Discharging should not be allowed to proceed awaiting proof of damage. The dumping should not be permitted unless it is demonstrated to be harmless Reasonable doubt should be sufficient to stop discharging.

3. That uniform standards should be set for all comparable industries. One industry should not enjoy an economic advantage over another by virtue of its failure to clean up. It has come to our attention that other taconite producers in Minnesota, U.S. Steel at Virginia and Erie Mining Company at Hoyt Lakes have been required to operate with completely closed systems in order not to pollute nearby lakes. We cite this to demonstrate that tailings are considered pollutants in those instances and also that such a closed system is feasible. It appears to us that the state has established a double standard, one for U.S. Steel and Erie Mining Company and another for Reserve Mining Company.

4. That the precedent setting nature of the decisions being made at this conference be recognized. Variances permitted now may be multiplied many times as new communities or industries develop.

We wish to reiterate a plea we have made to our Pollution Control Agency at two recent hearings. Minnesota is on a continental divide. Our waters are replenished by rain, and we receive most of them pure. Before they leave our borders they have been stamped as sewer or resource. Of all states our water quality should be the easiest to guarantee. Social responsibility demands our sending it on to our neighbors containing as few poisons as possible.

Water Testimony

Mrs James
McDonald
115 Edgewood ave
Madison Wis

V 371

League of Women Voters

50 ~~=~~ copies to Mary

20
70
50
140

LEAGUE OF Women Voters of Minnesota, 555 Wabasha Street, St. Paul, Minnesota 55101

Testimony given by
Mrs. William Brascugli, Water Reources Chairman
League of Women Voters of Minnesota
At the Lake Superior Enforcement Conference, May 13, 1969
Hotel Duluth, Duluth, Minnesota

I am Mrs. William Brascugli, Water Resources Chairman of the ~~Minn~~ League of Women Voters of Minnesota. I am also representing Mrs. ThomasIrvine, Water Resources Chairman of the League of Women Voters of Michigna.

The League of Women Voters of the United States has studied the use and preservation of the nations water resources since 1956. Two years ago local Leagues across the country in 1250 communities expressed to the national Board their conviction that the pollution of our waters must be controlled. They agreed that 1) control of wastes should be considered one of the costs of production and 2) that new industrial plants, from the beginning of their operation, should be required to meet high water quality standards without financial aid from federal funds. When an industry is unduly penalized ~~xxxxx~~ with relation to its competitors by undertaking to clean up present operations, we have supported government aid where necessary.

It is our belief that it is becoming incrasingly important for ~~xxxxx~~ water users to ~~xxxxxxxxxxxxxxx~~ discharge water in as much the same condition as it was withdrawn as is possible.

When pollution control occasions a greater cost to the consumer, we are perpared to work toward public acceptance of that cost.

We appreciate the value of commitment on the part of local and state governments to ~~xxxxxx~~ set and maintain the highest possible standardds. But we also recognize the fact that powerful political and industrial interests may exert strong pressures ~~xxxxxxx~~ making it difficult to enact and darry out ~~the~~ pollution abatement programs ~~xxxxxxxxxxxxxxxxx~~ on the state and local level. For this reason, we believe that the federal government has an important role to play in protecting the broadest public interest when the state or local ~~xxxxxxxxx~~ efforts fail. Certainly the quality of the water in Lake Superior should be a matter of interstate, and even international concern.

League of Women Voters of Minnesota - 555 Wabasha Street, St. Paul, Minnesota 55101

February 1968

RETURN TO STATE OFFICE BY
MARCH 29, 1968

ADVANCE REGISTRATION AND RESERVATION
STATE COUNCIL MEETING
April 16 - Nicollet Hotel - Minneapolis

FROM: League of Women Voters of _____
Check/Checks totalling $_____ are enclosed.

DIRECTIONS:
1. List member's name and address on the proper line.
2. If she plans to attend the banquet and/or luncheon, put a check in the proper column.

ENCLOSE:
1. A check payable to the League of Women Voters of Minn. covering:
   a. Complete package - registration, banquet, luncheon - $11.00
      or
   b. Luncheon ticket - $7.00 (includes registration)
   c. Banquet ticket - $4.75 - registration not required, but reservations must be made in advance - no later than April 14.
2. Credentials card for each delegate (President and one other)

	NAME ADDRESS	Banquet	Lunch
President			
Delegate			
Visitors			
*Observers			

* Representatives of provisional Leagues attend as observers.

How well we take care of Lake Superior, perhaps our most beautiful natural resource, will affect the future of at least three states and Canada.

The economic devel opment of Lake Superior is just beginning. Plans are being made for more extensive tourist business, for increawed taconite production, for a gasseous diffusion plant on the Knife River by the Atomic Energy Commission, and for the prospect of extensive copper-nickel production in northern Minnesota. There is even talk of a canal connecting Lake Superior with the Mississippe River. If we do not ~~take~~ set and enforce high standards, Lake Superior is certain to be destroyed. Furthermore, because of the low rate of turnover of Lake Superior water, (90% turnover in 500 years), unlike that of the other Great Lakes, the destruction will be practically irreversible.

For these reasons we urge:

1. That all industries and municipalities now dumping into Lake Superior be immediately and thoroughly evaluated.

2. That the burden of proof be placed upon the industry or municipality. ~~Procedure should~~ Discharging should not be allowed to proceed awaiting proof of damage. The dumping should not be permitted unless it is demonstrated to be harmless. Reasonable doubt should be sufficient to stop discharging.

3. That Uniform standards should be set for all comparable industries. One industry should not enjoy an economic advantage over another by virtue of its failure to clean up. Insert #1

4. That the precedent setting nature of ~~the process~~ the decisions being made at this conference be recognized. Variances permitted now may be multiplied many times as new communities or industries develop.

We wish to reiterate a plea we have made to our Pollution Control Agency ~~on~~ at two recent hearings. Minnesota is on a continental divide. Our waters are replenished by rain, and we receive most of them pure. Before they leave our borders they have been stamped as a sewer or resource. Of all states our water quality should be the easiest to guarantee. Social responsibility demands our sending it on to our neighbors containing as few poisons as possible.

League of Women Voters of Minnesota - 555 Wabasha Street, St. Paul, Minnesota 55101

February 1968

RETURN TO STATE OFFICE BY
MARCH 29, 1968

ADVANCE REGISTRATION AND RESERVATION
STATE COUNCIL MEETING
April 16 - Nicollet Hotel - Minneapolis

FROM: League of Women Voters of _____
Check/Checks totalling $_____ are enclosed.

DIRECTIONS:
1. List member's name and address on the proper line.
2. If she plans to attend the banquet and/or luncheon, put a check in the proper column.

ENCLOSE:
1. A check payable to the League of Women Voters of Minn. covering:
   a. Complete package - registration, banquet, luncheon - $11.00
      or
   b. Luncheon ticket - $7.00 (includes registration)
   c. Banquet ticket - $4.75 - registration not required, but reservations must be made in advance - no later than April 14.
2. Credentials card for each delegate (President and one other)

	NAME ADDRESS	Banquet	Lunch
President			
Delegate			
Visitors			
*Observers			

* Representatives of provisional Leagues attend as observers.

Insert #1

It has come to our attention that other taconite producers in Minnesota, U. S. Steel at Virginia and Erie Mining Company at Hoyt Lakes, have been required to operate with completely closed systems in order not to pollute nearby lakes. We cite this to demonstrate that tailings are considered pollutants in those instances and also that such a closed system is feasible. It appears to us that the state has established a double standard, one for U. S. Steel and Erie Mining Company and another for Reserve Mining Company.

League of Women Voters of Minnesota - 555 Wabasha Street, St. Paul, Minnesota 55101

February 1968

RETURN TO STATE OFFICE BY
MARCH 29, 1968

ADVANCE REGISTRATION AND RESERVATION
STATE COUNCIL MEETING
April 16 - Nicollet Hotel - Minneapolis

FROM: League of Women Voters of _____
Check/Checks totalling $_____ are enclosed.

DIRECTIONS:
1. List member's name and address on the proper line.
2. If she plans to attend the banquet and/or luncheon, put a check in the proper column.

ENCLOSE:
1. A check payable to the League of Women Voters of Minn. covering:
   a. Complete package - registration, banquet, luncheon - $11.00
      or
   b. Luncheon ticket - $7.00 (includes registration)
   c. Banquet ticket - $4.75 - registration not required, but reservations must be made in advance - no later than April 14.
2. Credentials card for each delegate (President and one other)

	NAME ADDRESS	Banquet	Lunch
President			
Delegate			
Visitors			
*Observers			

* Representatives of provisional Leagues attend as observers.

I am also representing Mrs. Thomas Irvine, Water Resources Chairman for the LWV of the State of Michigan, League, with members,

TESTIMONY given by Mrs. William Brascugli

at the Lake Superior enforcement conference, May 13, 1969
Hotel Duluth

I am Mrs. William Brascugli, Water Resources chairman of the State of Minnesota League of women voters, an organization of 5,800 members in 68 communities throughout the state. (The League of Women Voters of the U.S. with 150, 000 members, seeks--as one of its goals--the improvement of water quality) The league worked toward the creation of the PCA, we have tried to develop citizen understanding of the problems of pollution, the possibilities for creative solutions to those problems, and are working toward strengthening the powers of the PCA.

Two years ago all 1, 250 local leagues rep orted clearly to the National Board that members agree that 1) control of wastes is one of the costs of production, and 2) new plants, from the beginning of their operation, should be required to meet high water quality standards without financial aid from federal funds, It is our belief that it is becoming increasingly important for industries to return water in as much the same condition as it was withdrawn as is possible. We believe that pollution control is the cost of doing business, and are prepared to work toward public acceptance of that cost. We have long stood for government aid when necessary, and legislation providing tax incentives for those industries undertaking to clean up pollution.

Before any enforcement program, by any level of government can be successful, there must be p ublic realization of the urgent necessity for strict enforcement, for no laws are enforceable without wide-spread p ublic acceptance. Is there any doubt is anyone's mind that the public backs the enforcement of standards of Lake Sup erior, in fact, would like to see the standards raised?

States are often under strong pressures which make it difficult to enact and carry out the pollution abatement program that the state needs. Because the federal government is less affected by political and industrial interests powerful in a single state, the LWV is convinced that the federal government has an important role not only in se

role not only in setting standards and encouraging sta tes and municipalities to get on with the work, but also in strengthening enforcement of abatement when local and state efforts fail.

Certainly the State of Minnesota is failing in this case - how can there be a double standard - one standard for U.S. Steel and Erie Mining Co. , and another for Reserve? How can our P CA tell two companies they must have completely closed systems, and yet allow Reserve to dump tailings into Lake Superior. If U.S. Steel's tailings are too polluted to allow them to let one small drop over-flow the holding ponds into the water table, why are not Reserve's tailings too polluted for Lake Superior? We do not understand how anyone can say that Taconite tailings are not polluting the lake! It should not be a matter of "how much" pollution can Lake Superior stand.

It is incredible to League members that anyone can be so irresponsible to future generations and their use of the lake to say "let's wait and see", it isn't polluted yet" It's too late to look back in the year 2000 and say, "Oh , yes, I guess we were wrong - Lake Sup erior was being p olluted after all. "
We see that kind of thinking on Lake Erie.

Minnesota's water resources are a vital part of the state's economic base. How well we take care of Lake Superior, p erhaps the state's most famous and beautiful natural resource, will affect the state's future. The public waters belong not to one town, or one industry, but to all the people. No one industry or municipality has the right to pollute those waters. In Minnesota and Wisconsin we have a unique situation - no other state is polluting water, then sending it into Lake Superior. We receive our water pure. We have no clean-up problem except for what we ourselves produce. Of all states, our water quality should be the easiest to guarantee. We have a social responsbility to send our Lake Superior water into the other great lakes containing as few poisons as possible.
If we have made mistakes in the p ast, now is the time to rectify those mistakes, before it is too late.

League of Women Voters of the U.S.
1200 - 17th Street, N.W.
Washington, D.C. 20036

June 20, 1969

STATEMENT IN SUPPORT OF THE EXTENSION OF TITLE I
OF THE ELEMENTARY AND SECONDARY EDUCATION ACT
BEFORE THE EDUCATION SUBCOMMITTEE OF THE SENATE
LABOR AND PUBLIC WELFARE COMMITTEE
BY
MRS. RICHARD G. MILLER, HUMAN RESOURCES CHAIRMAN,
THE LEAGUE OF WOMEN VOTERS OF THE UNITED STATES
June 20, 1969

I am Mrs. Richard G. Miller of Carson City, Nevada, Human Resources Chairman of the League of Women Voters of the United States. I am here today representing our 157,000 members from more than 1200 communities in the fifty states, the District of Columbia, Puerto Rico, and the Virgin Islands, to testify in behalf of federally supported programs for compensatory education.

The League applauds the chairman and the members of this subcommittee for the realistic tone you set in opening these hearings last week. You were so right in emphasizing that what is accomplished legislatively is of little consequence indeed unless it is accompanied by adequate appropriations. When the time for funding comes, in spite of pressures for appropriations from all other areas of national and special interest, we know that you will continue to exert your leadership to encourage giving the priority it deserves to equality of opportunity for education. In these efforts, I can assure you, you will have the support of the League of Women Voters.

Equality of opportunity for education is one of the most important needs of Americans as individuals and of our country as a whole if it is to develop into a truly free society for all our people. Meeting this need requires the active interest of all levels of government and of private citizens and requires commitment of resources and of talent. Most important and perhaps above all, it requires conviction that the goal of equality of opportunity in education can and must be achieved.

Strong Federal Leadership is Needed to Achieve Equality of Opportunity in Education

Strong federal leadership must be exerted if our country is to succeed in bringing disadvantaged people into the mainstream of American life. We must respond to the educational needs of every American so that each can develop his full potential as a citizen, a wage-earner, and a contributor to our national society. Federal leadership must be committed to this end so that our society, with all of its diversities, can be unified and really free for all of our people.

Education is Only One Remedy to Poverty and Discrimination

League support for equal opportunity for education derives from an intensive study by local League members of the facts about poverty and discrimination in their communities and in the United States. Education is not the only remedy for poverty and discrimination, but our study has convinced us that it is an essential and basic component of any solution. Moreover, we firmly believe that the pursuit of equal educational opportunity must be conducted simultaneously on several levels. We must continue to press forward vigorously to integrate our schools, both in the North and in the South; we must remove the barriers of housing discrimination so that children of minority populations now locked into separate spheres of existence will be integrated in our schools in the normal course of community life for the enrichment of all of us; we must see that equal opportunity for employment and advancement exists -- not just in policy statements but in reality; and we must also continue to equalize educational opportunity by means of support for compensatory programs.

Funding of compensatory programs is beyond the single-handed capacity of the cities from which so many affluent people have fled and in which so many of the poor and discriminated against are trapped. Funding of compensatory programs in rural areas -- in many cases without the resources to provide the kinds of school programs needed -- is also extremely difficult. Therefore continuing federal help is needed.

Leagues Report Some Successes of Title I Programs

We believe also that there must be, on a national scale, thorough research to find ways and means to provide relevant, meaningful, effective education for those who have not found in our schools the kinds of challenges or training beneficial for their needs. There must be change, innovation, experimentation, evaluation -- all of which require money, patience, trial, and allowance for error. The school systems which must effect change to fulfill their responsibilities for providing equal educational opportunity are least able to find sources of local revenue. They need a long-range federal commitment as well as adequate and advance appropriations so that programs can be planned and developed and staff assigned with the assurance that title I projects will continue. Our local Leagues frequently report as a major handicap the fiscal uncertainty which results in school administrators' inability to coordinate the school planning schedule to the appropriations schedule: that school programs can't get started on time or sometimes rush into operation before mechanisms have been well set up, with the result that "we don't get a dollar's worth of program for a dollar." For example, the League of Women Voters of Hinsdale, Clarendon Hills, and Oakbrook (Ill.) reports "Local (federal) programs have been limited to the Elementary and Secondary Education Act, which the school districts are using very capably. School libraries have had their budgets for materials increased substantially without an increase in staff to handle the extra work, which has caused some distress. The short term, erratic nature of grants of federal money is certainly a weakness."

Leagues have observed and continue to watch the operation of title I programs in their communities. They are not equipped, of course, to evaluate on a scientific testing basis the effectiveness of federally funded title I programs. In fact, it is still probably too early to evaluate in terms of acceleration in reading ability, or other immediately measurable gains. However, other effects, not so quantifiable, have been observed by many of our Leagues. For example, the League of Women Voters of Sudbury (Mass.) reports of a special summer corrective program:

"1. The teachers felt that they learned more about how children learned than they had anticipated and all feel that they will never again teach in quite the same way.
"2. There was a marked change in the attitude of the children toward their own capabilities."

And a September 1968 report from the League of Women Voters of Cheyenne (Wyo.) says of title I programs in its schools:

> "Significant accomplishments were as follows: 1. created a happier feeling and desire to learn among the participants; 2. eliminated many of the barriers to learning; 3. improved self-concepts and confidence; 4. helped to improve attitudes of parents toward education in general."

These samples of many reports in similar vein indicate that perhaps the impact title I programs have on not only the educationally disadvantaged but also on the schools and the parents will not be immediately measurable. Nonetheless these are important and long-range gains.

Four-year extension

When the League testified earlier this year in the House in support of title I of ESEA, we supported its extension for five years. We did so because we believe that compensatory programs should have the assurance of long-range federal commitment. In view of the flow of events since then, however, we are now asking this committee to recommend a 4-year extension. (This seems a more realistic request in face of the facts: the House approved only a 2-year extension -- through FY 1972; the Administration similarly is asking for a 2-year extension only, in order that it might review the legislation after the 1970 Census data are available; and S. 2218, the bill introduced by the chairman for himself and the majority members of this subcommittee calls for a 4-year extension through FY 1974.)

The Administration arguments for a 2-year extension only have merit; limiting extension to 2 years would assure review of the programs before 1972. However, we believe that these evaluations can and should take place irrespective of the length of time for which ESEA authorization is extended. Furthermore, equally important as having assurances that evaluations will be made are assurances of long-range commitment. The only way to express long-range commitment is in terms of extension of authorization. We ask therefore that this subcommittee recommend a 4-year extension of authorization for title I of ESEA.

Payments for Children from Public Housing

We are pleased that the bill passed by the House provides an amendment to the impacted areas program, for payments to local school districts to cover roughly half the local cost of education for children who live in public housing. We ask this subcommittee to support such an amendment. It has merit on at least two significant counts. First of all, it would bring needed additional funds to school districts that sorely need them. Secondly, it can have a salutary effect in relieving citizens' opposition to public housing in their own communities. Such opposition -- Anthony Downs, a consultant to the National Advisory Commission on Civil Disorders, calls it "fiscal self-defense" -- is often based on the fear that public housing will strain the capabilities of local schools and local taxes which support them.

Our critical housing shortages pose a serious threat to the nation, of this there can be no doubt. Nonetheless, "fiscal self-defense" at the local level often clouds this realization, and weighs heavily in deciding whether or not a given community will agree to provide housing for lower income families. Additional federal help to local school districts based on their numbers of public housing children can thus help to remove one important obstacle standing in the way of achieving our national housing goal of a decent home in a suitable environment for every American.

Citizen Involvement

Last week, Secretary Finch talked to this committee about the importance of title I of ESEA and described it as HEW's largest single education program, that has "focused over $3 billion since its passage on perhaps the most crucial problem challenging educators today: how to educate successfully the children of America's poor." It is a large program reaching some 9 million children in about 16,000 school districts -- and it is also a flexible program, in that decisions rest with local school administrators to use the program funds for a variety of special services

The League would like to stress the importance of involving in these decisions about the use of title I funds, the parents of the children for whom this legislation was designed. If there is one thing that we can be sure of, it is that we do not yet know what are the most effective ways of meeting the educational needs of all children. Furthermore, educators alone are not likely to come up with all the answers. Parents and community representatives must be allowed to have their say, along with the educators, in making decisions about programs to be supported with title I funds.

Their involvement in these decisions is important not only because it can help to screen the most effective programs, but also for a reason enunciated earlier this year by the Administration. Preserving control and policy formulation at the local grassroots level would "...help channel valuable community energies toward the improvement of title I and encourage the accountability of title I administrators to those whom title I serves."

In closing, I would like to thank the chairman and members of this subcommittee for your persistent efforts to help provide equal educational opportunities to all American children and to assure you that the League is likewise working vigorously to support these efforts.

# # # # # #

CF LETTER
a report on environmental issues from
THE CONSERVATION FOUNDATION

June 9, 1969 6-69

In this issue: A look at the problems, the pressures and a plan for wise use and conservation of a superb natural resource -- San Francisco Bay . . . A landmark case history in environmental management . . . The bay's future is up to the California legislature.

A CLASSIC CONFRONTATION IN CALIFORNIA:

CITIZENS MOVE TO SAVE SAN FRANCISCO BAY

One of the nation's most dramatic environmental struggles has entered a tense, crucial stage in California. At issue is the future use and appearance of a splendorous estuary, San Francisco Bay.

Various cities, counties and private interests yearn to continue filling in and developing the fringes of the bay -- in the name of economic needs and progress. At odds with them are many conservationists and others who seek greater protection of the bay's natural beauty, its recreation potential and its resource values.

The struggle has been going on for almost a decade, but it has now come to a head in the California state legislature. To the extent that the legislature fails to pass a strong protective measure, in the current session, the bay will be opened again to further uncoordinated, destructive development.

Specifically at stake is the continued existence of the San Francisco Bay Conservation and Development Commission -- an interim agency set up in 1965 to protect the bay -- and whether it will be empowered to implement a plan for wise use and conservation of a magnificent natural resource.

"Great and Glowing Promise"

San Francisco Bay -- including San Pablo and Suisun bays to the north -- stretches about 50 miles from north to south and varies in width from 12 miles down to one mile. Much of it is surrounded by softly rolling hills, or by the low mountains of the coastal range. Through a narrow gap in these mountains, the spectacularly beautiful Golden Gate, the bay opens to the Pacific Ocean.

For the some 5 million people living on or near its shores, and for millions of visitors, the bay is both a large and refreshing open space, and a ceaseless series of beautiful scenes. "You always remember the first time you saw San Francisco Bay," wrote Harold Gilliam, a chronicler of the area, ". . . a thing of beauty and power that had somehow become part of you . . . No matter what your age, you were young, and the bay around you and the city beyond it were the future, full of great and glowing promise . . . You felt a sudden blaze of exhilaration."

The Conservation Foundation 1250 Connecticut Avenue, N.W., Washington, D.C. 20036 | phone (202) 659-2180
Sydney Howe, Acting President **Marvin Zeldin,** Director of Information Services **Rice Odell,** Assistant Director

On esthetic grounds alone, the bay is a resource of inestimable value. Countless rhapsodies praise it. Put more practically, a view of the bay can add 8-10% to the value of a home or office in San Francisco. And of course the bay and waterfront are major tourist attractions.

But it is also many other things which argue against allowing its shrinkage through filling. As a place of recreation -- for boating, swimming, fishing, hunting, hiking -- it is said to provide 30 million "participant days" each year. The bay, including its many square miles of marshes and mud flats, supports an extensive and valuable marine life. It is also an important haven and feeding ground for millions of waterfowl on the Pacific Flyway between Canada and Mexico.

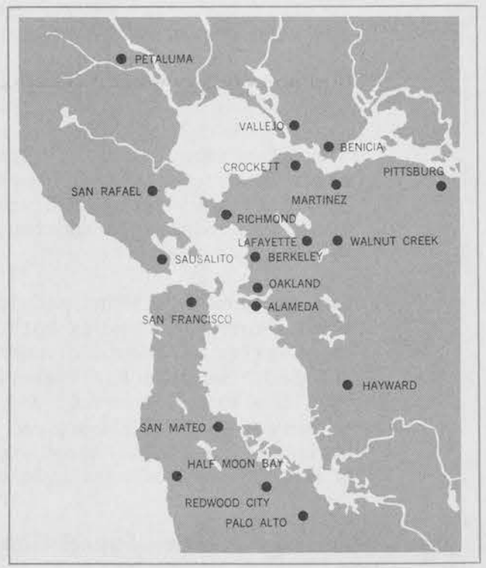
The large bay, with the great flushing action of tides sweeping in from the ocean and out again, not only helps maintain marine life but is important in breaking down and disposing of vast wastes from the area, and minimizing water pollution. Further, the large bay surface is a moderating influence on the weather.

The bay, of course, is one of the world's great harbors, and its rim is dotted with ports and water-oriented industries. It also produces important yields of commercial fish, oyster shells, sand and salt.

The Great Temptress

San Francisco Bay has always been a great temptress. And not merely to the sailor and fisherman. As planner Mel Scott has said of the bay: "To attorneys, developers, title insurance companies, land companies, manufacturers of salt and cement, innumerable government officials, members of the state legislature and many others it is some of the most valuable real estate in California."

And it was treated as such by the state itself for more than a century. A good deal of the bay -- including submerged lands, tidelands and marshlands -- was sold by the state to private interests, sometimes for as little as a dollar an acre. Some was filled and built upon, much more is still held with an eye to filling and development. Large areas were diked off and are still used as "salt ponds," for production of salt from sea water by evaporation. Still other areas were granted by the state to cities and counties for harbor, airport and other development. In 1850, when California was admitted to the Union, the surface of the bay at mean high tide was about 680 square miles. Now the bay covers an estimated 430 square miles (though most of the reduction is not from filling, but from diking off salt ponds or managed wetlands which could be reclaimed as part of the bay.) Private interests claim ownership of about 22% of the bay (title in many areas is disputed). Significantly, much of this 22% is in the most critical and valuable areas adjacent to the shoreline. Cities and counties



ACCESS

Of the 276 miles of San Francisco Bay shoreline, it is estimated that only about 10 miles are open to the public. Norman B. Livermore, Jr., head of the California Resources Agency, has spoken of the "appalling lack of bay access and recreational facilities adjacent to some of our most heavily populated areas where large numbers of our less affluent citizens reside. . . Unless we make every effort to provide truly low-cost access to recreational opportunities along the edge of the bay, we will be locking up a great resource from a whole generation of youngsters who desperately need it."

hold about 23% of the bay, much of it also adjacent to the shore. The state owns about 50%, and the federal government the remaining 5%.

Why is the bay so tempting? For one thing, most of it is so shallow it invites filling. Seventy per cent of the bay is less than 18 feet deep at low tide, and the U.S. Army's Corps of Engineers has estimated that some 248 square miles are "susceptible of reclamation." This makes it possible to create valuable waterfront real estate at a very low cost per square foot.

Also, the hitherto fragmented political jurisdiction of the bay area (nine counties border on the water) and the absence of regional control meant that local governments were free to act in their own economic self-interest, free from the constraints of a broader responsibility for the bay. Indeed, local officials find the bay a most convenient outlet for expanding port facilities, laying on more highways, extending airport runways, and simply dumping garbage and other solid wastes.

Thus there are extreme economic pressures for filling. Developers want the profits. Cities and counties want the added tax revenues. Additional pressure comes simply from an expanding population. The current nine-county bay area population is estimated at 5 million plus, a sharp increase from the 1950 total of 2.7 million. And it is expected to climb to some 7.5 million in just two decades, creating added demands for housing, factories, commerce and jobs, as well as for recreation.

Pending development proposals alone would fill another 59 square miles or so of the bay and its marshes -- or more than 10% of what's left. And this can be considered just a beginning if the door to inappropriate development is re-opened. Also, the figure does not include expressed intentions to fill and develop large areas of salt ponds.

Much of the bay land in private ownership has filtered into the hands of several large owners. Thus the Leslie Salt Co. claims about 46,000 acres of salt ponds. (About 4,200 acres of Leslie holdings have already been filled to become the Redwood Shores community in Redwood City.) On the east side, 3,400 acres of bay are claimed by the Atchison, Topeka and Santa Fe Railway, which has put forth an elaborate plan for waterfront development, including some 1,000 acres of fill. Among the municipal projects: the Port of Oakland wants to fill about 2,500 acres, mostly to expand its airport.

But the project which has most incensed many people is called Westbay. It

"THE POWER OF ORDINARY CITIZENS"

"There's a great ferment going on," says Harold Gilliam, who believes the public emotion over San Francisco Bay is "symptomatic of a state of affairs extending far beyond the bay itself. It is rooted deep in the contemporary crisis . . . the ordinary citizen's growing feeling that his life and environment are increasingly at the mercy of forces over which he has no control. The symbols of these forces are bureaucracy and the bulldozer." Gilliam says the bay commission and its plan will "prove that Americans are not powerless in the face of rampant technology, that new institutions can be established to meet our deep need for an orderly, healthful, humane, beautiful environment."

would involve filling and development along 27 miles of San Mateo County shoreline, with apartment buildings, hotels, convention, education and commercial centers, port facilities, light industry and restaurants -- as well as park and recreation areas. The Westbay plan encompasses 10,179 acres -- including 3,274 acres to be filled, and the remaining 6,905 acres "to be made available for public acquisition" for parks and open spaces. Some critics have acidly asked why the public should purchase such areas to enhance the beauty and value of privately developed lands. One comment: "Westbay makes a big thing of public access and recreation, but it doesn't say this would have to be paid for by the public." Some insist that such developers should be required to "dedicate" part of their holdings for public use, as other developers often do with public streets, commons, playing fields, and the like.

Westbay is a project of Westbay Community Associates, a blue-chip joint venture of the Ideal Cement Co. (which is providing about half of the 20,000 bay acres it claims), the Crocker Land Co. (the Crocker banking interests are among the most prominent in the state), the investment banking firm of Lazard Freres and Co., and New York banker David Rockefeller and Associates. Westbay states that its plan, involving an investment of some $3 billion, emphasizes the "amenities, recreational and visual." But conservationists and others violently disagree, charging the Westbay interests with blatant disregard for appropriate use of the area.

Rallying to "Save the Bay"

Public reaction to physical threats against the bay has been strong and relentless. Like most such citizen movements, there was a modest beginning. Mrs. Catherine Kerr, wife of former University of California president Clark Kerr, often drove foreign dignitaries through the bay area, and they sometimes chided her about the unattractive waterfront. Mrs. Kerr discovered one day in 1960 that her friend Mrs. Sylvia McLaughlin, also a resident of the hills overlooking the bay, was similarly concerned with the appearance of the bay and with proposals to fill in more of it. They soon enlisted the aid of a third university wife, Mrs. Esther Gulick. They met with conservationists and others and started the Save San Francisco Bay Association.

The group took two important steps. First, it prompted a study by the university's Institute for Governmental Studies. The result was a book by Scott published in the fall of 1963 called "The Future of San Francisco Bay." This dramatized the threats to the bay and served as a beacon for subsequent efforts to protect it. Second, the group enlisted the support of an aggressive

and influential legislator, the late State Senator J. Eugene McAteer of San Francisco. McAteer, aided by the Scott study and increasing pressure from the public and the press, pushed through a bill creating a commission to make an official study of the bay problem. Working with considerable dispatch, the commission reported in a few months that piecemeal, inappropriate development of the bay was most ill-considered. It recommended that the bay be protected and that a regional plan for its management be worked out.

Aided by Assemblyman (now Senator) Nicholas C. Petris of Oakland, and pressure by the Association, McAteer managed the passage in the very next session of a law creating the San Francisco Bay Conservation and Development Commission (BCDC). BCDC, comprised of 27 members from many fields, was charged with making a detailed study of the bay and preparing a "comprehensive and enforceable plan" for the conservation of the bay's water and the development of its shoreline. The law prescribed that the plan be submitted to the governor and the legislature at the start of the 1969 session.

The legislature declared in the McAteer-Petris Act that "the public has an interest in the bay as the most valuable single natural resource of an entire region." It said the bay operates as a "delicate physical mechanism in which changes that affect one part of the bay may also affect all other parts." The legislature said further that "the present uncoordinated, haphazard manner in which the San Francisco Bay is being filled threatens the bay itself and is therefore inimical to the welfare of both present and future residents of the area . . ."

It noted that "no governmental mechanism exists for evaluating individual projects as to their effect on the entire bay . . . (and) a new regional approach is necessary." Thus, the legislature declared, "it is in the public interest to create a politically responsible, democratic process by which the San Francisco Bay and its shoreline can be analyzed, planned and regulated as a unit."

Even more important, and to widespread surprise, the legislature gave BCDC some potent muscle during the study and planning period: it required anyone wishing to fill any of the bay to obtain a permit from BCDC. And it specified that a permit be granted only if a project is (1) "necessary to the health, safety or welfare of the public in the entire bay area," or (2) "of such a nature that it will not adversely affect the comprehensive plan being prepared." Thus for four long years BCDC was empowered to put the brakes on filling and development. (BCDC has not insisted on a complete

A SECOND FRONT

An important new dimension was added to the struggle over San Francisco Bay on April 2 when the State Lands Commission filed suit in California Superior Court challenging the ownership of certain lands and the rights of certain owners to fill and develop them. One contention is that some bay lands were conveyed in public trust for commerce, navigation and fishing, and that development would violate that trust. The suit is confined to part of the bay. If successful, it could block the controversial development proposed by Westbay Community Associates, one of many defendants. But the suit has implications for other areas as well.

moratorium; it has allowed minimal filling -- a total of 370 acres as of this spring, including 265 acres for airport expansion.)

A Remarkable Document

With a staff of 10, plus outside consultants, and at a cost of some $750,000 in appropriations, BCDC completed its plan and submitted it on schedule in January of this year for consideration by Governor Ronald Reagan and the legislature. Some conservationists charged that the plan embodies several unfortunate compromises. Would-be developers criticized many of its provisions in unmistakable terms. But by and large it has been acclaimed as a remarkable plan -- a far cry from the usual planning document couched in unclear, idealistic and platitudinous generalities. The BCDC plan could well serve as a model for the nation's other estuaries and coastlines. Some of its principal recommendations and policy statements:

* "The most important uses of the bay are those providing substantial public benefits and treating the bay as a body of water, not as real estate."

* "All desirable, high-priority uses of the bay and shoreline can be fully accommodated without substantial bay filling, and without loss of large natural resource areas. But shoreline areas suitable for priority uses -- ports, water-related industry, airports, wildlife refuges, and water-related recreation -- exist only in limited amount, and should be reserved for these purposes."

* The plan proposes minimal filling, a maximum water surface area, and maintenance of high water quality and adequate fresh water inflow. Purposes: to benefit recreation and scenic enjoyment, to maintain fish and wildlife resources, to lessen water pollution, and to moderate the weather. To this end, the plan also calls for maintaining and restoring marshes and mudflats and recommends that the diked salt ponds and managed marshlands (most used as duck hunting preserves) not be converted into urban developments. This could be done by property tax policy, public purchase of the lands ("man's last substantial opportunity to enlarge the bay rather than shrink it"), or possibly by purchase of "development rights."

* The plan proposes the reservation of some 19,000 acres of additional land for industries specifically requiring waterfront sites, with the locations specified in a series of maps.

* The plan proposes expansion of some port facilities, "to keep San Francisco Bay in the forefront of the world's great harbors." But, it says, any dredging or filling "should be in accord with an overall regional port development plan."

* The plan proposes a regional airport system. Pending its completion and the building of "reliever" airports in the region, new general airports should be built away from the bay, and expansion of existing airports into the bay should be permitted "only if no feasible alternative is available."

* The plan offers detailed recommendations for providing recreation -- marinas, boat launching ramps, fishing piers, hiking and biking paths, beaches and commercial recreation facilities oriented to the water. The plan includes about 5,000 acres of existing shoreline parks and 5,800 acres of new parks on the waterfront. Recreation needs were projected 50 years ahead. But BCDC noted that even if all these marinas, parks, beaches and the like were established, "there would still be only a small part of the shoreline open to the public." Therefore it recommends that "maximum feasible opportunity for pedestrian access to the waterfront should be included in every new development in the

ON THE CONGRESSIONAL FRONT

Congressman Don Edwards, backed by a number of his California colleagues, has introduced a bill (H.R. 2749) authorizing the Secretary of Interior to establish a national wildlife refuge in the south San Francisco Bay area. Edwards envisions a large area, in four sections, of 18,195 acres. The Leslie Salt Co., major property owner in the region, is adamantly opposed. Among other factors, the company cites a "rapidly growing need and public sentiment for a major airport facility" adjacent to the bay in the south. Meanwhile, the subcommittee on Conservation and Natural Resources of the House Government Operations Committee has held the first of several hearings on San Francisco Bay. And Congressman Paul N. McCloskey and other bay area legislators have hinted at federal intervention to protect the bay if the state does not act.

bay or on the shoreline, whether it be for housing, industry, port, airport, public facility, or other use." The plan includes guidelines for attractive development of the bay shorelines. Similarly, it calls for drives and "vista points" to take maximum advantage of scenery.

* BCDC calls for creation of a regional agency with power to "analyze, plan and regulate the entire bay and shoreline as a unit." Thus, it should have limited jurisdiction over the shoreline as well as the bay itself. This jurisdiction, which would vary from 100 feet up to an occasional maximum of 1,000 feet, should include enough shoreline land "to make an effective use of each prime site."

In some cases the regional agency would "designate and reserve the shoreline areas needed for each priority use, in a manner analagous to zoning." In general, shoreline development would have to be consistent with the bay plan, i.e., attractive in design, considerate of public access, etc. The agency would have detailed permit procedures for restricting filling and dredging to conform with policies. As its first choice for managing the bay, BCDC recommends a limited regional government agency, multi-purpose in nature, to consider the San Francisco region's overall needs and avoid duplication. Barring that politically doubtful solution, BCDC calls for a single-purpose agency concerned only with the bay.

* The plan notes that providing parks, beaches and other recreation would require "substantial public financing," even with much private investment in recreation. BCDC estimates that the present purchase price of all 5,800 acres of recreational land and 1,600 acres of proposed wildlife refuges is $30 million to $50 million. It says the first order of business for recreation funds should be to "build fishing piers, beaches and other shoreline recreational facilities in urban areas where large concentrations of persons live near the bay but are presently unable to use or enjoy it."

* BCDC's estimates of the total "full market value" of all 57,000 acres of privately-claimed lands wholly or partly in the bay range up to a maximum of $285 million. But BCDC's plan does not provide for compensation of all private owners whose claimed "rights" to fill would be limited by the plan. BCDC's reasoning: many owners will be able to make some economic use of their holdings under the plan; some owners apparently hold their property subject to a "public trust" entitling the public to use the waters for commerce,

navigation and fishing; BCDC's legal experts anticipate that the courts would uphold a limitation of use on grounds of "overwhelming" public interest, the low cost and speculative nature of the original purchases, zoning precedents, and on other grounds. Thus the minimum estimate for acquisition is $28.5 million.

Some of these policies are obviously highly controversial, and the plan has, of course, been widely attacked by developers whose projects are clearly inconsistent with the recommendations -- Westbay, for example. Westbay attorney Richard Archer said the BCDC plan, by foreclosing development, would prevent the creation of thousands of new jobs and homes for an expanding population; and would prevent private funds from creating new tax bases that would yield millions of dollars in state, county and municipal revenues. A plan that "stifles economic growth," he said, "may in a very narrow sense 'save the bay' as it now is, but it may well drown other human aspirations and needs that require equal if not greater priority."

Private owners have also rebuked BCDC for not designating greater acreage for industry, adding that BCDC's own independent study had recommended at least twice as much. "The plan should have teeth," said Archer. "But this one has fangs." Archer also said the plan is "basically unrealistic because of the vast amount of public tax money it requires" for land acquisition and compensation. (A Leslie Salt Co. representative, referring to the plan's theory that compensation would not be required, called it "Fabian socialism.")

Also widely criticized is the recommended extension of public jurisdiction over some shoreline areas and the inclusion in the plan of the salt ponds and managed wetlands, which the owners say they do not consider part of the bay.

From the other side come other arguments. Said the Sierra Club's Dwight Steele: "We think the plan provides for much too much development." Specifically, he said it is a mistake to permit filling to accommodate "restaurants, specialty shops and motels"; or more freeways, transmission lines, and oil and gas drilling, all of which would be allowed under certain conditions. Steele also criticized provision for a possible supertanker facility in the middle of the bay. And he said that, since "the ghettos are shut off from the bay," the plan should do more to maximize public access to the water.

The Struggle for the Future

Like the coach that turned into a pumpkin, BCDC is slated by law to go out of existence now that its plan is finished. It is due to expire 90 days after the current regular session of the California legislature. If the legislature, which now is expected to wind up its business sometime in July, does not take positive action to continue BCDC or create another agency with control over the bay, the major obstacle to uncontrolled development will disappear.

This threat has stirred bay partisans to a new crescendo of concern, resulting in what might be called the Great Bay Uprising. "This is the biggest issue we've had around here for five years," said one legislative assistant in Sacramento. "There's more mail pouring in than on a tax bill." He said it's coming not just from traditional conservationists, but all geographic areas and economic groups. "This issue has struck a raw nerve."

Perhaps sensing this, but also apparently because he was pressed hard by several key men in his administration, Reagan evoked considerable surprise in his January 7 State of the State message by calling for the continuation of BCDC. Amending his prepared text, he said: "We cannot permit a lapse, no matter how short, in the protection of this priceless natural resource."

Adding to the public's concern, however, was the news that various private landowners had hired some of the most influential lobbyists available. "Seasoned and well-financed," the San Francisco Examiner called them. (One of the lobbyists is E. Robert Stallings, who retired on January 15 as San Mateo County manager. He was hired by Westbay, whose project would be located in the county.) On April 18, six senators from the bay area issued a statement of warning that "well-planned, well-organized, and well-financed campaigns have been mounted in Sacramento to cripple the present program for controlling bay filling."

The Save San Franciso Bay Association says its membership is growing at a rate of 2,000 a month. Also, a large group of conservation and other organizations joined to form the Citizens Alliance to Save San Francisco Bay, a coalition designed to operate only during the legislative session. Aided by a public relations firm, still another group, the Save Our Bay Action Committee, is active in San Mateo -- a key locale because the county's Senator Richard J. Dolwig has not only been considered a key opponent of strong legislation, but is chairman of the Senate Governmental Efficiency Committee, to which bay bills were first referred.

Dolwig introduced his own bill to create a new bay commission, giving it five years to come up with a new general plan for the bay area and providing for weaker and somewhat ambiguous controls over filling during the interim. This bill, combined with what was interpreted as Dolwig's stalling on the issue, earlier hostility to BCDC, and the long association of his name with commercial interests, led to a barrage of criticism in the press and an aggressive publicity campaign against him. "The people are angry," one observer noted. And a pointed editorial in the San Francisco Chronicle said: "It should not be necessary to warn legislators representing this region that the people of the bay area will be unforgiving to those who fail in their responsibility to save the bay from unwise exploitation, disfigurement and diminishment."

The upshot of this pressure was an extraordinary political about-face. Dolwig suddenly called a press conference on May 8 and announced that he was introducing "massive" amendments to his bill. When they were laid out, it became clear that the new Dolwig bill was stronger than anything else pending in the legislature. (Senator Petris and Assemblyman John T. Knox, authors of the strongest bills up to then, conceded as much.) Dolwig, a Republican, added that he expected the support of the Republican Reagan administration.

Did he change his mind so radically because of the adverse publicity and the "thousands of ladies in buses" who kept descending on Sacramento, the senator was asked. "I should say not," he replied, adding that for some time his committee staff and the BCDC staff had been working on amendments. But there were few who believed that the switch had not been prompted by intense political heat.

A number of legislators changed positions along with Dolwig. Said the Chronicle: "Since both Dolwig and (Senator John F.) McCarthy (of San Rafael) have come under intense heat from home for the early versions of their bay fill legislation, their critics will consider it the height of irony -- as well as legislative legerdemain -- if they emerge from this session as saviours of the bay." "Save the Bay" supporters were elated, of course. But they also feared -- and still fear at this writing -- that the battle could still be lost.

A dozen assemblymen cautioned against "overconfidence and complacency" by conservationists. Others have urged similar caution, even though the Knox bill has passed the Assembly, and even though three bills, including an amended Dolwig proposal, were reported out by the Senate Governmental Efficiency

Committee on May 27. For there is still opposition to strong legislation from cities and private owners. And Assemblyman George W. Milias of Los Gatos warned that special interests were lobbying the legislators of southern California.

Also, now comes a new political crunch: The bills have been routed to the Senate Finance Committee which, under the chairmanship of Senator Randolph Collier of Yreka, is considered far from friendly by bay supporters. There is widespread suspicion that strong bay legislation may be scuttled there -- with no blame attached to bay area legislators whose political futures are at stake. And there is the final danger that delaying tactics might bury any legislation in the last hectic days of the session.

The Legislative Choices

Many observers originally believed that the legislature would at least extend the life of BCDC with more or less the same power -- particularly since Reagan announced his support. But because the climate has changed so dramatically, a large segment of the public no longer considers this sufficient.

One key issue is implementation of the BCDC plan itself. William Siri, president of the Save The Bay Association, praised the plan but added: "We've already compromised as far as the plan is concerned. Now it must have the force of law. A mere continuance of BCDC is not a guarantee against fill. There has been a slow but certain erosion of BCDC."

Some would simply adopt the plan as law -- though it was at first argued that it does not lend itself to legislative enactment. In any case, Dolwig's bill would incorporate eight of the plan's major policies and recommendations as legislative guidelines for a successor commission to follow in regulating fill and carrying out its other development responsibilities. These guidelines, it is believed, will put the commission on sounder legal ground in the courts if owners of bay lands challenge the restriction of their development rights without compensation. In one significant legal decision (Consolidated Rock Products Co. v. City of Los Angeles, 57 Cal. 2d 515, 1962), the California Supreme Court upheld zoning which precluded virtually any economic use of a piece of land partly on grounds that the restriction was based on a comprehensive zoning plan. If implemented, the BCDC plan would be tantamount to zoning, some of its supporters believe.

Another key issue is shoreline control, and in this respect the Dolwig proposal was stronger than other bills. It called for jurisdiction over a continuous 300-foot wide strip surrounding the bay. However, this was amended in committee to 100 feet. It also would extend the powers of the bay commission to salt ponds and managed wetlands. Further, it not only would maintain BCDC (under the name San Francisco Bay Commission) but would make it permanent, with continued regulation of filling and dredging. The commission would be empowered to amend its own plan.

Some Lessons

The struggle to save San Francisco Bay has been a pioneering effort. It offers many lessons to those who seek to protect other estuaries and other natural resources. Consider the ingredients of the struggle:

* A resource with sex appeal; one that excites the enthusiasm of citizens from all walks of life. As Harold Gilliam said, "The bay has charisma."

In the view of BCDC's executive director, Joseph E. Bodovitz, the bay became

a "symbol of environmental problems," and people began to get a psychological feeling that "if you can't do something about a problem as relatively simple as this you'll never do anything."

* A strong, factual piece of research (such as the Scott report) to justify and back up a public action program to protect or enhance the resource.

* A nucleus of concerned, hard-working citizens -- many of them politically astute and able to arouse the support of others (including the press), foment political pressure, generate timely publicity, and raise money.

* A powerful and effective legislator to take up the cause. (McAteer provided this leadership until his death. He was followed by Senator George P. Miller, Jr. Since Miller died last January 1, others in the legislature have taken on the job.)

* A good law creating an effective planning agency which, even during its study and planning period, could protect the object of its concern. Thus, it was extremely important that BCDC had power over fill permits during its planning years. Aside from the obvious advantages, says Bodovitz, this "keeps everybody out of the ivory tower approach, because a good part of the time is spent dealing with real problems. And this in turn reinforces the validity of your planning, because at the same meeting you're deciding about planning ideas while you're trying to decide if somebody should fill in this area. It also gets people to meetings." And it creates a "much livelier interest" in the press.

* An agency with a membership broad enough to represent all significant affected interests. BCDC, for example, consisted by law of the following: two federal officials (Corps of Engineers and HEW); six state officials; a representative from each of the nine counties bordering on the bay; three city representatives; and seven public members, bay area residents whose appointments are subject to confirmation by the state senate. At the time the plan was completed, these consisted of two businessmen, two attorneys, a civic leader, an architect and a public relations consultant.

* An agency that operates openly, with public hearings and public debate. In addition to the obvious merit, this kept the press and the public interested and involved in shaping the future of the bay. The BCDC plan thus evolved over a period of time, as specific bay problems -- such as fish and wildlife, recreation, airports, etc. -- were presented to commission members in 23 individual reports and summaries. The agency thereby obtained policy statements on each issue as work proceeded, and ended with a strong plan.

* Finally, of course, a resulting plan that is needed, that will achieve the desired environmental results, that is enforceable, that is respected, and that draws wide support. And also, perhaps, a plan that is adjusted to political, fiscal and legal realities.

("Sure BCDC compromised," said one Californian. "But it wanted to go to the legislature with something that had a chance.")

With all these ingredients present, BCDC and its plan have been the most promising effort yet to design a comprehensive management system for a major natural resource -- a system fitted to an area's ecology.

The California legislature will now determine the future of BCDC, of its plan -- and of the resource itself, San Francisco Bay.

# # #

POINT OF VIEW

There is much at stake in San Francisco Bay.

Few if any other natural resource decisions being faced across the nation concern the daily lives of millions of persons so directly. Nowhere else in the nation is a complex resource issue which has had so thorough and truly ecological an investigation now facing decision. This investigation was conducted by specialists from all appropriate disciplines, under control of commissioners drawn by law from the jurisdictions affected. The Bay Conservation and Development Commission plan is a landmark achievement in both land-use planning and regional consensus.

It is doubtful that those who strive for environmental quality have ever approached a major land and water system more responsibly. Yet the forces backing massive bay-fills and opposing BCDC still include leading businessmen who are respected for good civic works. Ironically, one would-be filler of San Francisco Bay is reported to have observed recently that the United States would not now find itself waging quite so desperate a battle against pollution if business had listened more closely to conservationists and ecologists in the past.

Surely, conservationists and ecologists are not infallible, but their cautions are just as roundly pooh-poohed by San Francisco Bay development interests as were similar warnings of 20 years ago that pollution and blight would diminish all our lives. We must stop adding to the environmental casualty lists, and San Francisco Bay is a good place to draw the line.

--Sydney Howe, Acting President, The Conservation Foundation

For further information: Bay Conservation and Development Commission, 507 Polk St., Room 320, San Francisco, Calif. 94102. Save San Francisco Bay Association, Inc., Box 925, Berkeley, Calif. 94701. Citizens' Alliance to Save San Francisco Bay, 46 Kearny St., San Francisco, Calif. 94104.

CF LETTER

The Conservation Foundation
1250 Connecticut Avenue, N.W.
Washington, D.C. 20036

Non-Profit Organization
U.S. POSTAGE
P A I D
Washington, D.C.
Permit No.42693

6-9-69

RETURN REQUESTED

Save the Lakes Symposium

August 18-19, 1969

Detroit Lakes High School Detroit Lakes, Minnesota

Sponsored by:

Pelican River Watershed District

Cormorant Lakes Watershed District

Minnesota Water Resources Board

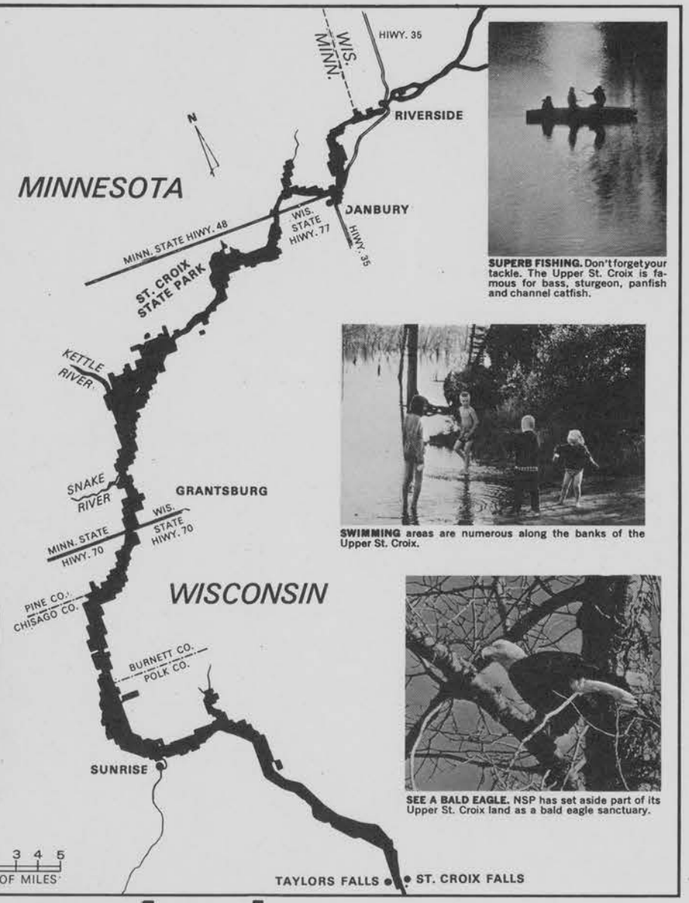
City of Detroit Lakes and the

Agricultural Extension Service, University of Minnesota

WILDLIFE PRESERVE. Bring binoculars. You'll find deer, black bear, raccoons, ducks, mink, beaver, fox, weasels, coyotes, etc.

TAKE A CANOE TRIP. NSP has provided many accesses along 70 miles of the Upper St. Croix.

WILDERNESS CAMPING among the virgin pines is an experience you'll never forget.



SUPERB FISHING. Don't forget your tackle. The Upper St. Croix is famous for bass, sturgeon, panfish and channel catfish.

SWIMMING areas are numerous along the banks of the Upper St. Croix.

SEE A BALD EAGLE. NSP has set aside part of its Upper St. Croix land as a bald eagle sanctuary.

This land is your land.

For 50 years NSP has saved 70 miles of Upper St. Croix wilderness for you. Here's how you can enjoy it.

If you board a canoe at Riverside, Wis., you can paddle down 70 miles of one of America's most perfectly preserved wilderness rivers . . . the Upper St. Croix.

You may see a deer or a black bear. Watch an otter, muskrat or a beaver go for a swim. Or take one yourself. Catch a sturgeon or smallmouth bass. Camp in the cradle of virgin pines. If you're lucky you'll see a bald eagle.

For 50 years NSP has owned most of the land on either side of the Upper St. Croix River and has maintained the area in its wild state.

An open invitation

We encourage campers, hunters, fishermen, canoeists and nature lovers to come and enjoy its beauty. If you would like information, write to NSP Conservation Dept., 414 Nicollet Mall, Minneapolis, Minnesota 55401.

Numerous public accesses to the river have been made available by NSP. We've even leased 7,000 acres on the Minnesota side without charge to the U.S. Government, which has assigned its lease to the state of Minnesota. This land is now part of St. Croix State Park.

Our surroundings are our concern

We at NSP have maintained and will continue to preserve the natural wilderness of this area because we're concerned about the beauty of our surroundings. After all, we live here too.

NSP

a brighter life for you

TABLE of CONTENTS

"All the rivers run into the sea;
Yet the sea is not full;
Unto the place from whence the rivers come,
Thither they return again."
Ecclesiastes 1:7

PRESERVING MINNESOTA'S LAKES:

Responsibilities Of Citizens And Government

ROBERT O. MEGARD

Assistant Professor
Department of Ecology and
Behavioral Biology
University of Minnesota

JOHN J. WAELTI

Assistant Professor
Department of
Agricultural Economics
University of Minnesota.

FORWARD

Issues of general controversy become prominent or fade into obscurity depending on the immediate urgency with which they are viewed by the public. Concern is frequently expressed today over the meager influence that an individual citizen seems to have over events that determine his well-being. Rapidly increasing population, technological advances that outpace the capacity of individuals and institutions to adjust, and the complex nature of today's problems with the magnitude of effort they demand, all combine to give the individual a feeling of ineffectiveness—a feeling that he is not a part of the decision-making process.

A specific issue over which individual citizens frequently feel they have no control is the apparent deterioration in the quality of our environment. Of particular concern to citizens of Minnesota is the preservation of our lakes, not only for our own use and enjoyment, but as an obligation and a responsibility to generations yet unborn.

An all-encompassing task such as preserving environmental quality requires public action. Because this task is too big to be performed by individuals alone, governmental agencies are established and charged with specific functions contributing to this objective.

In keeping with the fundamental premise that the role of government is to serve the needs of people, public agencies must be aware of and responsive to the needs of people. This implies, however, that individual citizens must become informed, and express their goals and needs so that meaningful, constructive interaction can occur between citizens and government. The solution of difficult problems cannot be accomplished by citizens or government alone. It must be a cooperative effort.

A prime example of citizen initiative is that taken by residents of Becker County, Minnesota, to form the Pelican River and the Cormorant Lake Watershed Districts in an attempt to solve water quality problems in that area. Among the educational activities of the Districts was the sponsoring of a "Save the Lakes Symposium" in August, 1969, the occasion for which this publication was written.

The purpose of this publication is to make available to the public facts pertaining to lake pollution and to help put into perspective the cooperative role of citizens and government in preserving Minnesota's lakes.

LAKES AND EUTROPHICATION

BY ROBERT O. MEGARD

Assistant Professor
Department of Ecology and
Behavioral Biology
University of Minnesota

Many people are becoming alarmed at the steady deterioration of our lakes. They notice that severe blooms of algae, which normally occurred during the "dog days" of late summer in the past, begin earlier and continue longer now than they used to. This is occurring at a time when lakes are being used more intensively for recreation and homesites, and it is evident that there is a link between people and lake deterioration—the people who came to enjoy lakes are helping to destroy them. Lakeshore residents are not solely responsible for lake deterioration, however. They receive cooperation from farmers who use inadequate soil and water conservation practices, and from cities and industries who discharge wastes into lakes and streams. People do this out of carelessness or because they choose to pay the price of environmental degradation, which is cheap in purely monetary terms, rather than the price of adequate waste disposal and careful watershed management.

What has happened? The lakes have been artificially and inadvertently enriched with nutrients from their watersheds, and the nutrients stimulate the growth of algae in the water. Many kinds ("species") of these microscopic green plants are normally present in lakes, but a few species of blue-green algae are favored in enriched lakes. They become very abundant, often forming scums or dense green clots on the water surface (Figures 1 and 2). The nutrients that cause this growth are chiefly phosphorus and nitrogen—the same substances used in fertilizers to stimulate the growth of plants on land—but many other inorganic and organic substances are also involved. The nutrients are released from sewage, even "treated" sewage; some trickle into lakes from overloaded or improperly located septic tanks, some from industrial wastes, still others from farmland, feedlots, and lawns. Thus the nutrients come from many sources.

The word "eutrophication" has been coined for this process of nutrient enrichment, and lakes that are rich in nutrients are called eutrophic lakes. Lakes that are poor in nutrients are called oligotrophic. Lakes in southern, western, and central Minnesota, where the soils are rich in nutrients, are naturally more eutrophic than the lakes in the northeast, where the soils and rocks are nutrient-poor. The only long-term solution to the problem of lake eutrophication is to identify the nutrient sources for each lake and to reduce the nutrient influx. There is very little that can be done to remove the nutrients after they have entered the lake because extremely low concentrations are involved; often less than 0.1 parts per million, in the case of phosphorus, are sufficient to produce dense algae blooms. In fact, only algae can remove nutrients from water efficiently at these concentrations. A better alternative might be to remove nutrients from tributary streams, where concentrations are normally several times greater than in lake water, but this is still economically prohibitive. The best alternative, therefore, is advanced sewage treatment and careful watershed management to prevent these nutrients from getting into surface and ground waters in the first place.

Again it must be emphasized that extremely small quantities are involved. Surface runoff removes only about one ounce (28 grams) phosphorus from an acre of agricultural land each year. However, the phosphorus in the annual runoff from 100 acres (2,800 grams) would yield a concentration of 0.035 parts per million in one acre-foot of lake water. This is the typical concentration in much of Lake Minnetonka, near Minneapolis, where there are several algal blooms each year. The depths with enough light for algal growth in Lake Minnetonka typically contain less than 3 pounds phosphorus per acre, but each pound of phosphorus may participate in the production of almost 9 pounds (dry weight) of algae each day, or almost 26 pounds per acre. The fresh weight of the algae produced each day is far greater than this because algae are more than 90% water; thus **pounds** of phosphorus in a lake may actually stimulate the production of **tons** of algae. The average daily growth rates are higher in Lake Minnetonka than in any other Minnesota lake that has been studied, somewhat higher than the averages in Shagawa Lake (16 lb./acre) near Ely or Sallie Lake (17 lb./acre) near Detroit Lakes, and almost four times higher than in Lake Itasca (7 lb./acre).

People frequenlty ask if it would be feasible to remove nutrients from lakes by harvesting algae.

Figure 1

Fig. 1. A scum of algae floating in a quiet bay of Shagawa Lake, near Ely, Minnesota. The masses shown here are made up of colonies of the blue-green alga **Aphanizomenon,** *which is often the dominant nuisance alga in lakes throughout Minnesota.*

Figure 2

Fig. 2. Nuisance algae as they appear under a microscope. The spiral chain of cells is called **Anabaena**, *and the rounded clumps are called* **Coelosphaerium.** *Photomicrograph by Dr. A. J. Brook.*

Again it must be remembered that algae are mostly water, so that there are only several hundred pounds of dry organic matter per acre. Nobody has yet been able to devise a method for filtering algae from the large volumes of water that would have to be filtered to affect a large lake significantly. Thousands of gallons would have to be filtered to recover 1,000 pounds of wet algae, which would yield less than 100 pounds of dry organic matter, less than 0.1 pounds of phosphorus, and perhaps 4 pounds of nitrogen. Poisoning the algae is not a satisfactory solution because the nutrients remain in the water where they can be utilized as soon as the poison is dissipated. These are additional arguments for preventing nutrients from getting into lakes in the first place.

ALGAE AND NUTRIENT CYCLES IN LAKES

Algae contain about 4% nitrogen and 0.1% phosphorus. The algae use nitrogen to make protein, and phosphorus is used for many vital metabolic reactions and growth processes that occur within cells. Algae require many other substances for growth, particularly carbon dioxide, water, and sunlight, but the supply of these in lakes obviously cannot be controlled. Nitrogen gas is dissolved in lakewater, but most algae cannot use it. Instead they get their nigrogen from dissolved nitrate and ammonia. Many "nuisance algae," however, may "fix" their own nitrogen from the dissolved nitrogen gas, just as alfalfa and other legumes can on land. The nitrogen fixed by these algae ultimately may be utilized by other algae that cannot fix it; consequently the nuisance algae may themselves hasten the process of eutrophication. All algae depend upon dissolved phosphorus in the water. Even the nitrogen fixers require phosphorus to fix nitrogen and to grow.

As nutrients enter the water they are used by the algae until one of them is no longer available. Additional growth cannot occur until the supply of this critical nutrient increases, regardless of the quantities of other nutrients that may be present. Therefore the most effective way to control algae is to identify the nutrient that is critical and to limit its supply.

Some algae are decomposing as others grow, and the decomposing algae return some of the nutrients they contain to the water. By this mechanism part of the nutrient supply is regenerated, but most of the nutrients taken up are eventually removed from the water as dead and dying algae fall into the bottom sediments. Where there is abundant oxygen in the water, other inorganic mechanisms actively precipitate nutrients and other substances into lake sediments. The algae slowly decompose in the sediments and release more nutrients to the water, but most are permanently locked into the bottom. Sediments are often composed mostly of the carcasses of the microscopic plants and animals that lived in the lake.

Nutrients commonly accumulate in the deepest water of deep lakes during the summer, partly because of the "rain" of algae falling from the surface waters and partly because of sediment decomposition. The nutrients accumulated in deep water cannot be utilized by algae, however, because there is no light. Also, the nutrients cannot get into the surface waters where they could be utilized, because the cold deep water beneath the thermocline does not mix with the warm surface water. Furthermore most of the nutrients that accumulate in deep water are precipitated back into the mud when the oxygen supply is restored during the autumn circulation period. The bottom mud is therefore a "nutrient trap", and the algae would soon be starved if nutrients were not continually supplied from the watershed. In Lower Lake Minnetonka, for example, phosphorus is deposited in the sediments about as rapidly as it enters from the watershed; the amount deposited is at least 25 tons per year, or about 8 pounds per acre. The amount of phosphorus in the lake is rather constant from year to year; but it would double in only one year if it weren't for the sedimentation processes.

The nutrient cycles appear to be quite different in deep lakes than in shallow lakes, where its waters at all depths is about the same temperature and constantly stirred by the wind during the ice-free season. Nuisance growth of algae are far more common in shallow lakes, even in northeastern Minnesota. Statistics compiled by Dr. John Moyle in the Department of Conservation show that the average depth of lakes treated with copper sulfate to control nuisance algae was only 10.6 feet. Shallow lakes do not have a zone of deep, quiet water to inhibit nutrient recirculation, but many other features of shallow lakes may be equally as important to their high fertility. Shallow lakes will require much more intensive management than deep lakes to achieve comparable objectives, and in most cases it would be unwise to establish the same objectives for both shallow and deep lakes.*

NUTRIENT ABATEMENT

People have been reluctant to undertake drastic and expensive watershed management measures because they are pessimistic about the likelihood of success. It is often contended, for instance, that many years would be required to "flush" the lake, to replace the "polluted" water with "clean" water. This pessimism is probably unjustified in many instances. Nutrients are utilized by algae and deposited in sediments far faster than they are removed by flushing through the outlet. To use Lower Lake Minnetonka as an example again, the quantity of phosphorus in the lake ranges between 8 and 18 tons, which is less than the amount delivered from the watershed in a year. Hence the lake would probably respond to effective nutrient abatement within only a few years.

It is also contended that lakes will not improve

*Those interested in reading more about lakes and limnology will find the following books informative. Ruttner, F. **Fundamentals of Limnology.** Toronto, University of Toronto Press 1963, 295 p.

Reid, G. K. **Ecology of Inland Waters and Estuaries.** New York, Rheinhold, 1965, 375 p.

COONTAIL

VARIABLE PONDWEED

MUSKGRASS

CURLED PONDWEED

These are a few of the water weeds that are common in lakes, where they often get caught on fishing lures and boat anchors. The two "pondweeds" have roots and small flowers like most plants on land. Coontail is also a flowering plant but it does not have roots. Muskgrass, however, has neither roots nor flowers. It is actually an alga, more closely related to the microscopic forms that float freely in the water than to the flowering plants; the structures that hold it to the bottom are not true roots. The many kinds of weeds in lakes are described in Special Publication No. 53 of the Minnesota Department of Conservation, from which these drawings were taken.

until the nutrient concentrations in tributaries are less than the concentrations in the lake water. To achieve this reduction in a sewage effluent, for instance, would require reducing nutrient concentrations more than 99%, which would be prohibitively expensive. This pessimistic contention also does not take into account the sedimentation process in lakes. The degree of nutrient abatement required will depend upon a comparison of the total **quantities** entering a lake with the **quantities** that are in it, not concentrations. Accurate estimates of the degree of removal required, the cost, and the time required for lake improvement to occur can only be made after the total nutrient budget of the lake and its watershed has been analyzed.

The economics of nutrient abatement may force us to abandon our chaotic land-use patterns around lakes. At the moment, for instance, there are enough people living beside some lakes to pollute them but not enough to pay for municipal-type sewage disposal facilities. Lakeside homes now often have septic tanks that are overloaded or broken down, that allow nutrients from sewage to seep into the groundwater and then into the lake. Many of the cottages are old and poorly maintained, each with a dock jutting into the lake. When viewed from the water the lakeshore often resembles a rural slum. A more sensible and more aesthetic land use would be to have clusters of residences which could be served by central sanitary sewer systems. Each cluster would have its own marina, and most of the lakeshore would be uncluttered, a community park where one could stroll along the lake and enjoy the outdoors without trespassing. Clusters of residences would also increase the tax base for local units of government, because land away from the lakeshore would become more valuable. Now the land behind frontage lots block access to the lake. It should also be mentioned that it is difficult to justify spending public funds on lake restoration projects when private property blocks public access. Private lakeshore lots may be a luxury that we cannot afford—they destroy the beauty of the lakeshore, they result in lake pollution, and they are an economic burden on local governments.

We can no longer exempt particular industries from pollution abatement on the grounds that the cost will damage the economy. The argument that pollution control is too expensive has lost its validity. Someone, somewhere, is paying the costs of pollution. Our waste or someone elses comes to haunt us. It is often stressed, for example, that agriculture is a billion-dollar industry in Minnesota and therefore that we should be lenient with agricultural polluters; but tourism, which depends to an important degree upon clean lakes and streams, will also become a billion-dollar industry soon. It may not, however, if water quality deteriorates further.

Buffalo polluted their environment until a century ago, but the buffalo didn't know any better. Furthermore the buffalo moved to greener pastures when the environment became inhospitable; we don't have any greener pastures. We discover that there is always someone else upstream. Just as we have the technological capacity to exterminate buffalo herds, to clear the forests, and to plow the prairie, we have the ability to make the scummiest lake tolerable if we alter our economic priorities. Obviously it is unnecessary and undesirable to reclaim all lakes. It should be equally obvious, however, that lake deterioration is not the inevitable "price for progress." It is the price of narrow economic thinking and poor ethics.

Our lakes were formed after the glaciers melted 10,000 years ago. Although many basins are now filled with sediment, the lakes that remain will not disappear until their basins are also filled with sediments, a process that will require tens of thousands of years even if severe pollution continues. We obviously are going to have to live with our lakes. It is up to us to decide whether the lakes will become permanent invalids, chronic lesions on the landscape filled with evil-smelling water, or healthy partners in our environment. Their condition is our responsibility.

Our attitude toward lakes and other natural features is part of our heritage from the past, from the frontier days when we had to struggle against the forces of nature to survive. Our pollution problems are an outgrowth of this attitude, which is now outmoded. We must change our ethical outlooks and begin to regard the landscape with the same respect that we should have for our neighbors, to treat it as if it had a personality that reacts to abuse in the same way people do. Our welfare, and perhaps our survival, depends on it.

ECONOMIC VS. FINANCIAL CONSIDERATIONS

BY JOHN J. WAELTI

Assistant Professor
Department of
Agricultural Economics
University of Minnesota

It is sometimes argued that it is not **economically** feasible to incur the costs necessary to abate water pollution. A more accurate statement is that it may at times be **financially** disadvantageous to someone to incur such costs. **The distinction between financial and economic analysis is extremely important in the case of water quality.**

Financial analysis is concerned with costs and returns in pure **monetary terms** to an individual, firm, or other unit and is quantified in terms of profit and loss. In contrast, economic analysis involves the allocation of scarce resources such as land, labor, and capital, among competing uses. Economic analysis is frequently undertaken at a higher level of aggregation such as at a regional, state, or national level.

The ultimate test of the adequacy of resource allocation is not a simple measure of profit and loss in money terms, but a higher notion of utility, human welfare, or consumer satisfaction. Even the most critical skeptic must acknowledge that there are factors other than pure monetary measures that contribute to human welfare. An important example is a pleasant, healthful environment including clean water, clean air, adequate open space, and freedom from excessive noise. In other words, economic analysis is concerned with other costs and returns than those reflected in the price and market system.

One aspect of the economic problem lies in the fact that a given lake or stream can be put to a number of uses, some of which may be competitive, especially at high levels of use. Use of a lake for waste disposal is very competitive with many other uses, especially with use of lake for recreation and as an aesthetic contribution to the environment.

The decision of an industry or a municipality to discharge untreated or partially treated wastes instead of giving them more thorough treatment is based on **financial analysis,** that is, on the basis of profit and loss to the firm and on the basis of available public revenue to the municipality. To the firm, it is more profitable to discharge untreated or partially treated wastes than to incur costs for a greater degree of treatment. To a municipality, it is more simple to discharge only partially treated wastes than to raise taxes or float a new bond issue to acquire facilities for a more adequate degree of treatment.

These decisions on waste treatment based on **financial analysis** would not likely yield the same results as those based on **economic analysis.** As stated above, economic analysis is concerned with other measures of human welfare and would attempt to assess the loss of recreation and aesthetic values and increased cost of using polluted water against the cost of treating wastes.

Financial analysis is clearly not an adequate basis on which to base decisions involving water quality in that it omits important contributions to human welfare and does not consider costs and benefits outside the individual unit of analysis. While **economic analysis** is more inclusive, it suffers from an inability to place tangible values on costs and benefits which are not measured by the market mechanism. The point is, however, that while investment in water quality control may be **financially** distasteful to some, it may be sound from an **economic** viewpoint if measured by its contribution to human satisfaction and well being.

Because of limited resources, the level of investment in water pollution control, as well as in measures to enhance the quality of the environment in general, is subject to considerable controversy. Public expenditures paid for from individual taxes are competitive with private expenditures for clothing, housing, automobiles, and other items. In addition, public expenditures for pollution control must compete with expenditures for public schools, libraries, hospitals, and the many other public needs. In short, the specter of resource scarcity must be faced even by an affluent society.

The actual decisions involving the level of investment in water quality control depend on the economic priorities of the electorate which, in turn, depend on attitudes and value judgements. While economic analysis can be an aid to such decisions, the actual decisions are made by the electorate as expressed through elected officials and through policies carried out by public agencies.

The degree to which public policy accurately reflects the will of the electorate depends on the effectiveness with which citizens communicate their goals to state and federal lawmakers and, in turn, the responsiveness of lawmakers in giving direction and support to the action agencies responsible for carrying out public policy.

RESPONSIBILITIES OF GOVERNMENT AND CITIZENS IN WATER PROBLEMS

BY JOHN J. WAELTI

Assistant Professor
Department of
Agricultural Economics
University of Minnesota

RESPONSIBILITIES OF GOVERNMENT

A function of governmental agencies is to perform tasks which cannot be performed efficiently by individuals and to formulate and enforce regulations which are in the public interest. The collection and treatment of sewage in municipal areas is one example of an acitivity which must be done collectively. Other examples of public action at the local level include the formation of watershed districts and soil and water conservation districts. Although such districts are initiated and governed at the local level, they are provided for by state and federal legislation and have access to certain resources of state and federal government.

At the state and federal level, agencies such as the **Minnesota Pollution Control Agency** and the **Federal Water Pollution Control Administration** are charged with such tasks as establishing, monitoring, and enforcing water quality standards, performing research on waste treatment and water quality control, and administering grants to local government for construction of waste treatment facilities. Again, these are functions which cannot be efficiently performed by individuals acting alone.

Nearly all governmental agencies that are in some way concerned with lake eutrophication are involved with other aspects of water quality. Therefore, no attempt is made to identify those concerned only with lake pollution. In addition to the several agencies at the state and federal levels having considerable responsibilities regarding water pollution, there are many agencies whose responsibilities affect water quality, but are primarily concerned with water use, planning, or management in the more general sense. [1]

Those state and federal agencies as well as some non-governmental organizations having major responsibility for water quality are listed elsewhere.

RESPONSIBILITIES OF CITIZENS

Because attention to water quality problems is being rendered by government at the local, state and federal levels, it cannot be assumed that water quality problems are as good as solved. The solution of water quality problems to the satisfaction of citizens is going to require the attention, the insistence, and the participation of citizens in the process.

On an individual basis, responsibility includes seemingly insignificant items such as disposal of garbage and trash in such a manner as not to pollute a lake or other watercourse, and encouraging others to do the same. For lakeshore homeowners, responsibilities might include refraining from over-fertilizing lawns (which contributes to nutrient pollution and eutrophication) and installing waste disposal facilities in such a manner as to minimize lake pollution.

Although assumption of responsiblity on an individual basis is important and necessary, a greater degree of citizen participation eventually boils down to some form of involvement in political processes.

1/ An excellent source of information on public agencies involved in various aspects of water resources is: Souris-Red-Rainy River Basins Commission, **Appendix M-Part I, Legal and Institutional Environment,** First Draft, July, 1969. See also, Water Resources Coordinating Committee, **Water and Related Land Resources Planning in Minneosta,** State Planning Agency, St. Paul.

To be most effective, the citizen must become grounded in at least the fundamental technical and economic concepts involved as well as on the political processes by which decisions are made. This requires initiative, time, and effort. However, these are among the conditions required for participation in democratic procedures.

At the local or county level, citizens can encourage, or, to put it more emphatically, put pressure on county zoning boards to establish standards for placement of septic tanks, size of lake lots, building location, and other measures to preserve shorelands and recreational values of lakes.[1]

An example of citizen initiative at the local level is the establishment of the **Pelican River and Cormorant Lakes Watershed Districts** for the purpose of providing a means of concentrating effort on control of lake pollution. The formation of these Districts has enabled the procurement of state and federal funds (in addition to local funds) for financing education and programs of public awareness, as well as for funding experimental means of pollution control.

At the state and federal level, citizens can express grievances and make their views known to state and federal pollution control Agencies, to the State Legislature, and to the Congress to which these agencies are accountable.

In the Minnesota Legislature, bills involving various aspects of water quality control receive initial consideration in one of the following committees in the House of Representatives: Agriculture, Land and Water Resources, Conservation, or Governmental Operations. In the Minnesota State Senate, bills pertaining to water quality are normally referred to either the Agriculture, Public Domain, or Civil Administration Committees. In addition, any bills involving expenditure of State funds must go through the Appropriations Committee in the House of Representatives and to the Finance Committee in the State Senate.

In Congress, bills involving water quality normally are referred to the Interior and Insular Affairs Committees of the House and Senate or the Subcommittee on Air and Water Pollution of the Public Works Committee of both houses. In addition, bills which require the expenditure of public revenue must go through the Appropriations Committee of both the House and the Senate.

A word of caution is in order on the establishment of water quality standards. It is not enough to merely pass laws against water pollution or to establish water quality standards. **Standards must be enforced.** An enforcing agency requires funds to provide staff and equipment for monitoring and enforcement as well as for prosecution of violators. Public funds are also needed for research on more effective methods of waste treatment and prevention of eutrophication and other forms of pollution. If a citizen wishes to see more public revenue expended for such items, he should make his views known to lawmakers who appropriate the funds. Every informed citizen is aware of the conflicting demands on limited public revenue and resistance to tax increases. Because of this, lawmakers need a clear mandate from constituents to vote in favor of increased public expenditures for pollution control activities.

Too often, it is assumed that a state legislator or a Congressman is not interested in a local problem or does not have the time to devote to a specific problem. It must be remembered that lawmakers at both the state and federal levels serve at the pleasure of their constitutents. If a representative of a district wishes to remain one, he is well advised to be responsive to the problems of his constitutents and find the time to listen.

Citizens concerned with environmental quality have the responsibility of knowing the legislative program of their lawmaker regarding environmental quality and knowing how he has voted on such measures as the role of regulatory agencies, appropriations for agency staffing, funds for research, and aids to municipalities for waste treatment facilities. While the legislator at both the state and federal level has a responsibility to his constitutents, the citizen has the responsibility of making his views known to the legislator and, in particular, the responsibility to lend support when it may take considerable fortitude on the part of the legislator to vote for controversial appropriations necessary for pollution control activities.

Although the above has focused on the role of and relationship between private citizens and government agencies, much could be said concerning the role of industry and non-government organizations. Many private organizations such as the **League of Women Voters** and various conservation groups have many well informed citizens in their memberships. These groups can perform valuable educational functions and contribute significantly to solution of complex problems.

Although no rapid, easy solution to water pollution problems is around the corner, continued effort by citizens, government, industry, and private organizations can slow water quality deterioration to the level where options can still be preserved for the future. New and better technology can help, but results will largely depend on organizaing political support and clearly delineating economic priorities.

1/ Legislation passed by the 1969 Session of the Minnesota Legislature requires that such standards be adopted by Minnesota Counties.

FEDERAL AGENCIES

WATER POLLUTION CONTROL ADMINISTRATION

Great Lakes Region, FWPCA
Room 410
33 East Congress Parkway
Chicago, Illinois 60605

Missouri Basin Region, FWPCA
Room 702
911 Walnut Street
Kansas City, Missouri 64106

Upper Mississippi-Lake Superior Basin Office
Sub-Office Great Lakes Region
58th Street and 40 Avenue South
Minneapolis, Minnesota 55450

How and when was the Agency Established?

By the Water Quality Act of 1965 which amended the law of 1956 to establish the FWPCA in the Department of Health, Education and Welfare. An amendment to the Act in 1966 transfered the FWPCA to the Department of Interior.

Agency's Geographical Area of Responsibility?

Missouri Basin Region—Serves the drainage area of the Missouri River and the U. S. portion of the drainage area of the Souris, Red, and Rainy Rivers.

Great Lakes Region—Serves the drainage area of the Great Lakes and the Upper Mississippi River.

Upper Mississippi River Lake Superior Office—Upper Mississippi River drainage area in Minnesota and Wisconsin and the entire Lake Superior drainage area in Minnesota, Wisconsin and Michigan.

Official Duties, objectives and responsibilities?

Enhance quality and value of our water resources.

Establish national policy for prevention, control, and abatement of water pollution.

Makes grants to local government for the construction of municipal waste treatment facilities.

Works with States in the administration of water quality standards. Administers a Federal enforcement campaign against pollution of inter-state or navigable waters which endangers health or welfare.

Supports research and Development looking toward better means of controlling all forms of water pollution, with particular emphasis on finding improved ways to help municipalities and industry do the job. Provides technical assistance on difficult pollution problems, and supports and encourages the training of manpower for all aspects of water pollution control.

Encourages effective river basin planning that takes into account all factors affecting water quality.

Extends financial and other assistance to States to help them strengthen their own water pollution control programs.

In addition, the various regional Offices are charged with investigating principal sources of pollution, its effects on water uses, and developing programs for achievement of various water uses within their respective areas of jurisdiction.

What Services are performed in Direct Response to Citizen Requests or Complaints?

Is an excellent source of information and literature regarding pollution control programs, sources of pollution, and conditions in area of jurisdiction. Complaints are initially referred to the appropriate State Agency for action.

What is the most efficient means by which the individual citizen can best contact the Agency?

By letter to the above addresses or call Public Information Officer:

Missouri Basin ..... (816) 374-5493
Great Lakes Basin ..... (312) 353-5800
Upper Mississippi-Lake Superior Basin Office ..... (612) 726-1661

NATIONAL WATER QUALITY CONTROL LABORATORY

6201 Congdon Boulevard
Duluth, Minnesota 55804

How and when was the agency established?

Amendment of August 1962 to the Federal Pollution Control Act.

Agency's geographical area of responsibility?

Nationwide.

Official duties, objectives and responsibilities

Charged with the research of water quality requirements for:

1) Municipal use
2) Agricultural use
3) Industrial use
4) Recreational use
5) Aquatic life
6) Multiple of the above

What services are performed in direct response to citizen requests or complaints?

This being strictly a research laboratory and not an enforcement laboratory, all requests and complaints are referred to the Great Lakes Regional Office in Chicago, Illinois.

What is the most efficient means by which the individual citizen can contact the agency?

Phone call or letter to the Director, Dr. Donald I. Mount, at the National Water Quality Laboratory. (218) 727-6548.

STATE AGENCIES

MINNESOTA DEPARTMENT OF CONSERVATION

Division of Waters, Soils and Minerals

Room 347, Centennial Building
St. Paul, Minnesota 55101

How and when was the agency established?

Successor to Division of Waters; Division of Water Resources and Engineering; Division of Drainage and Waters; and the State Drainage Commission. The State Drainage Commission was established in 1897.

Agency's geographical area of responsibility?

Minnesota

Official duties, objectives and responsibilities of the agency?

Primary agency functions are administration and management of water resources of the state. The division processes and issues permits for work in beds of public waters and for appropriation of ground water and surface water. Other functions include investigations of ground and surface water problems including lake problems involving pollution, sedimentation and water levels.

What services are performed in direct response to citizen requests or complaints?

Field surveys and investigations and special studies and reports when sufficient funds and personnel are available.

What is the most efficient means by which the individual citizen can contact the agency?

Write to: Eugene R. Gere, Director
347 Centennial Office Building
St. Paul, Minnesota 55101

MINNESOTA DEPARTMENT OF CONSERVATION

Division of Game And Fish

Room 390 Centennial Building
St. Paul, Minnesota 55101

How and when was agency established?

The agency in its present form was established in 1931 by legislative action, but began in 1874 with the establishment of a 3 man fish committee.

Agency's geographical area of responsibility?

State of Minnesota.

Official Duties, Objectives, and Responsibilities?

Those related directly to water quality are:

- Maintenance of fish, game, and other wildlife on public waters. This requires knowledge of water chemistry.

- Management of aquatic plants in public waters including issuance of permits for control of biological aquatic nuisance (larger plants, algae, snails, leeches, etc.)

- Investigation of pollution as it affects fish and wildlife. The Division has a chemistry and biological laboratory in St. Paul and several smaller field laboratories. It maintains a comprehensive file of lake and stream surveys that contain water quality data.

What services are performed in direct response to citizen requests or complaints?

Field investigations and surveys as time, manpower, and funds permit, laboratory examinations of water and biological samples. Most of this work is concerned with fish and wildlife management and recreational use of waters.

What is the most efficient means by which the individual citizen can contact the agency?

Contact Game & Fish Personnel or write to Commissioner of Conservation or direct to Game & Fish Div., at the above address.

MINNESOTA POLLUTION CONTROL AGENCY

717 Delaware Street S. E.
Minneapolis, Minnesota 55440
Telephone: 339-8571

How and when was the agency established?

The Minnesota Pollution Control Agency was established by the Minnesota Legislature in 1967 (Minnesota Statutes Chapter 116.)

Agency's geographical area of responsibility?

The Minnesota Pollution Control Agency's geographical area of responsibility is statewide.

Official duties, objectives and responsibilities of the agency?

Policy and Purpose:

It is the policy of the state to provide for the prevention, control and abatement of pollution of all waters of the state, so far as feasible and practical, in furtherance of conservation of such waters and protection of the public health and in furtherance of the development of the economic welfare of the state. It is the purpose to safeguard the waters of the state from pollution by: (a) preventing any new pollution; and (b) abating existing pollution under a program consistent with the declaration of policy above stated.

Minnesota Statutes Chapters 115 and 116 provide for the basic pollution control authority through the Minnesota Pollution Control Agency as created therein. All state departments and agencies are directed to cooperate with the Pollution Control Agency and assist them in the performance of their duties.

The Agency has responsibilities for water pollution, air pollution and solid waste programs as provided in the above statutes. The Agency is given charges with the following powers and duties to administer the Water Pollution Control program:

To administer and enforce all laws relating to pollution; to investigate the extent character, and effect of the pollution of the waters of this state and to gather data and information necessary or desirable in the administration or enforcement of pollution laws, and to make such classification of the waters as it may deem advisable. To establish and alter reasonable orders requiring the discontinuance of pollutional discharges in excess of established standards.

To require the submission for review and approval plans for disposal systems and to inspect the construction thereof; to issue, continue in effect to or deny permits under such conditions as it may prescribe for the installation and operation of pollution control facilities.

To accomplish these and other functions, the Agency has established a professional operating staff in the air, water and solid waste fields.

What services are performed in direct response to citizen requests or complaints?

Investigation of citizen complaints of pollution by staff personnnel, surveys and field investigations in cooperation with local government or duly constituted organizations.

What is the most efficient means by which the individual citizen can contact the agency?

Contact is most easily made by letter addressed to the Director. In the event of emergencies, such as oil spills or other situations of immediate hazard the Director should be contacted by telephone. (612) 339-8571.

MINNESOTA WATER RESOURCES BOARD

3rd Floor Centennial Building
St. Paul, Minnesota 55101

How and when was the agency established?

By the Minnesota Legislature in 1955.

Agency's geographical area of responsibility?

State of Minnesota.

Official duties, objectives and responsibilities of the agency?

1. Establish watershed districts when petitioned.
2. Provide a forum for consideration of the whole body of water law when conflicting aspects of the public interest are involved.

What services are performed in direct response to citizen requests or complaints?

Direct their inquiry to the proper agency.

What is the most efficient means by which the individual citizen can contact the agency?

By direct contact — mail or telephone. (612) 221-2840. See your county agent or soil conservation district office.

NON-GOVERNMENTAL AND CITIZENS ORGANIZATIONS

SCIENTISTS INSTITUTE FOR PUBLIC INFORMATION

30 East 68th Street
New York, New York 10021

How and when was the agency established?
In 1963 as a non-profit educational corporation under the laws of the State of New York.

Agency's geographical area of responsibility?
National.

Official duties, objectives and responsibilities of the agency?
Primary focus of the Institute is on general problems of environmental conservation. Seeks out, informs, and enlists scientists of all disciplines in public information programs. Serves as national coordinating body for local science—information committees.

What services are performed in direct response to citizen requests or complaints?
Local committees sponsor speaker's bureau, serve as source of technical information.
At National Level, Publishes S.I.P.I. Newsletters.

What is the most efficient means by which the individual citizen can contact the agency?
National: Write above address.
Local: Minnesota Committee for Environmental Information
1092 - 25th Avenue S. E.
Minneapolis, Minnesota

PULP MANUFACTURER'S RESEARCH LEAGUE

Post Office Box 436.
Appleton, Wisconsin 54911

How and when was the agency established?
1939 - Organized by 12 pulp and paper corporations with common need to find new methods of processing pulp and paper mill effluents to eliminate water pollution.

Agency's geographical area of responsibility?
National.

Official duties, objectives and responsibilities of the agency?
Research on methods of treating pulp and paper effluents.

What services are performed in direct response to citizen requests or complaints?
Development of methods for processing wastes of pulp and paper industry.

What is the most efficient means by which the individual citizen can contact the agency?
Contact pulp or paper mill in immediate area of a pulp and paper waste disposal problem.

WATER POLLUTION CONTROL FEDERATION

3900 Wisconsin Avenue
Washington, D. C. 20016

How and when was the agency established?
In 1928, by a Committee of 100, all leaders in the water pollution control field (operators, researchers, managers, teachers) to further an exchange of information and knowledge through the media of a periodic technical journal and regional and national meetings.

Agency's geographical area of responsibility?
The Federation is composed of autonomous regional associations covering the 50 states, Puerto Rico, and some 17 countries abroad. Subscribers to the Federation publications reside in over 80 countries.

Official duties, objectives and responsibilities of the agency?
The Federation is a non-profit, technical membership organization whose objectives are to advance the fundamental and practical aspects of water pollution control by the dissemination of technical knowledge through publications, technical conferences, improvement of the professional status of those engaged in the field, promotion of public understanding the participation and encouragement of the adoption and implementation of sound regulations aimed toward effective water pollution control.

What services are performed in direct response to citizen requests or complaints?
Inquiries, both technical and otherwise, are answered; publications or reprints are furnished or cited; referrals are made, all as appropriate.

What is the most efficient means by which the individual citizen can contact the agency?
By letter directed to the Federation offices. In some cases the individual may be referred to the Federation Member Association in his area, or to the appropriate local, state, or federal water pollution control agency.

FRESHWATER BIOLOGICAL INSTITUTE

2845 Harriet Avenue South
Minneapolis, Minnesota 55408

How and when was organization established?
The institute is currently being formed. A fund drive for $4 million is currently underway and the possibility exists of operation by 1971.

Agency's area of responsibility?
Although the institute will be located on the shores of Lake Minnetonka, the research carried on there will have significance to freshwater regardless of location.

Official duties, objectives and responsibilities of the agency?
The goal of the Freshwater Biological Institute is to provide the facilities, equipment, and manpower for a broad, frontal, coordinated attack against the almost limitless complex problems of freshwater, learn the answers to these complexities, and apply these basic answers to freshwater problems around the nation and the world through scientists trained at and by the Institute.

What services are performed in direct response to citizen requests or complaints?
This being a research organization, requests or complaints by citizens requiring immediate attention would be referred to the appropriate governmental action agency.

What is the most efficient means by which the individual citizen can contact the institute?
Write to the above address or call Richard G. Gray at (612) 827-5521.

MINNESOTA ENVIRONMENTAL CONTROL CITIZENS ASSOCIATION (MECCA)

10th And Cedar
St. Paul, Minnesota 55101

How and when was the organization established?
In 1967 by a group of interested citizens in St. Paul in response to a conflict of land use adjoining Pig's Eye Lake.

Organization's Geographical area of Responsibility?
State of Minnesota. However, a number of organizations in other states are being formed which are similar in concept to MECCA.

Official Duties, Objectives and Responsibilities?
To provide a vehicle for organized citizen participation and to ensure that government agencies are responsive to needs of citizens and take into account ecology and natural cycle in the decisions of public policy.

What Services are performed in direct response to citizen requests or complaints?
Provides a means of public education and information on issues and grievances. The association relies upon scientific and technical personnel insofar as possible.

What is the most efficient means by which the individual citizen can best contact the agency?
Write to: MECCA
10th and Cedar
St. Paul, Minnesota 55101

GLOSSARY

Algae - a diverse category of relatively simple plants that live in water and in moist habitats on land. Many are microscopic cells or loosely organized colonies of cells that float in water as part of the plankton (see below) while others, such as marine sea weeds, may be hundreds of feet long and attached to the bottom. Many kinds of algae are normally present in water and they are a necessary source of food for other organisms, but a few species become very abundant in lakes enriched in nutrients, where they discolor the water, cause objectionable tastes and odors, and severely limit the usefulness of water for recreation and other purposes.

Colloidal Material - Finely dispersed particles suspended in water that make it "cloudy".

Ecology (Ecological) - The study of the interrelationships between organisms and their environment (Greek **oikos** house, **logos** discourse).

Effluent - An outflow of water such as from a septic tank or a waste treatment plant.

Enrichment - An increase in nutrients, especially nitrates and phosphates, which foster growth of algae and other plant life in water.

Epilimnion - The depth zone of freely-circulating surface waters in a deep lake during the summer in which temperatures are warm and relatively uniform. This is the zone in which light intensities are sufficient for the growth of algae (Greek **epi** on, **limne** lake).

Eutrophic - Waters with abundant nutrients and high organic productivity (Greek - **en** well, **trophein** to nourish).

Eutrophication - The process of nutrient enrichment. In this process the balanced mixture of organisms is replaced by relatively few species that tolerate high concentrations of nutrients and waste products or low concentrations of oxygen.

Hypolimnion - The zone of cold water beneath the thermocline in a deep lake during the summer. There is actually not enough light for algal growth in this zone and oxygen may disappear as organisms that fall into it from above are decomposed by bacteria. Shallow lakes may not have a hypolimnion unless they are protected from the wind. Even large, deep lakes may not have a hypolimnion where the wind is strong enough to circulate the water during the entire summer (Greek **hypo** under, **limne** lake).

Inorganic Matter - Chemical substances that are not organic.

Limnology - The scientific study of the biology, chemistry, and physics of inland waters (Greek - **limne** lake, **logas** discourse). The equivalent study of the sea is oceanography.

Metabolism - The chemical processes in organisms by which growth, respiration, and photosynthesis are accomplished.

Oligotrophic - Waters with a small supply of nutrients and low organic productivity (Greek - **oligos** small, **trophein** to nourish).

Organic Matter - Chemical compounds produced by plants and animals that contain mostly the elements carbon, hydrogen, and oxygen.

Parts per Million (ppm) - A common way to express the concentration of a dissolved substance in water. For example, 1 ppm phosphorous equals 1 oz. phosphorous in 1 million oz. of water.

Photosynthesis - The process by which green plants manufacture organic matter for growth in light from carbon dioxide and water. (Greek **photos** ligth, **synthesis** placing together).

Plankton - The community of small plants and animals that float passively in lakes and oceans. The plankton is a major source of food for most of the larger aquatic organisms (Greek **plankton** wandering).

Productivity In the context of water quality, refers to the capacity of a body of water to produce algae and other aquatic life. Productivity increases as eutrophication advances.

Pollution - Waste materials in a watercourse which adversely affect water for any particular use.

Thermocline - The depth zone beneath the epilimnion in a deep lake where temperatures rapidly decrease as depth increases. The temperature change in this zone prevents the warm water of the epilimnion from mixing with the colder deeper water (Greek **therme** heat, **klinein,** slope).

Turbidity - Cloudiness of water caused by presence of colloidal matter of finely divided suspended matter.

ADDITIONAL READING

Lakeshore Owners Seminar, Minnesota Lakeshore League, Feb. 3, 1968, 5 pages.

A New Era for America's Waters, U.S. Department of the Interior, Washington, D. C., 20006, (free).

On the Water Front, Leauge of Women Voters of the United States, 1026 17th St. N.W., Washington, D.C. 20246 (25 cents) 20 pages.

Planning for Pollution Control, Robert W. Snyder, Staff Paper P69-7, Department of Agricultural Economics, University of Minnesota, March, 1969.

Report on Progress in Water Pollution Control, Minnesota Water Pollution Control Commission, January, 1965, December, 1966. Illustrated with maps, 60 pages.

Septic Tank Care (Health Information Series No. 96), two-fold leaflet, 5c Inquiries Branch, Public Health Service, Department of Health, Education, and Welfare, Washington, D.C. 20201.

Understanding the Water Quality Controversy in Minnesota, John J. Waelti, University of Minnesota, Agricultural Extension Service, Bulletin 359, July, 1969.

Water and Water Pollution Control, A selected list of publications, March, 1968, U.S. Department of the Interior, Washington, D.C. 20006 (free).

Water Quality Sampling Program for Inter and Intra State Waters, L. E. Richie, Minnesota Pollution Control Agency, June, 1968.

The Cost of Clean Water, U.S. Dept. of the Interior, Federal Water Pollution Control Administration, Jan., 1968.

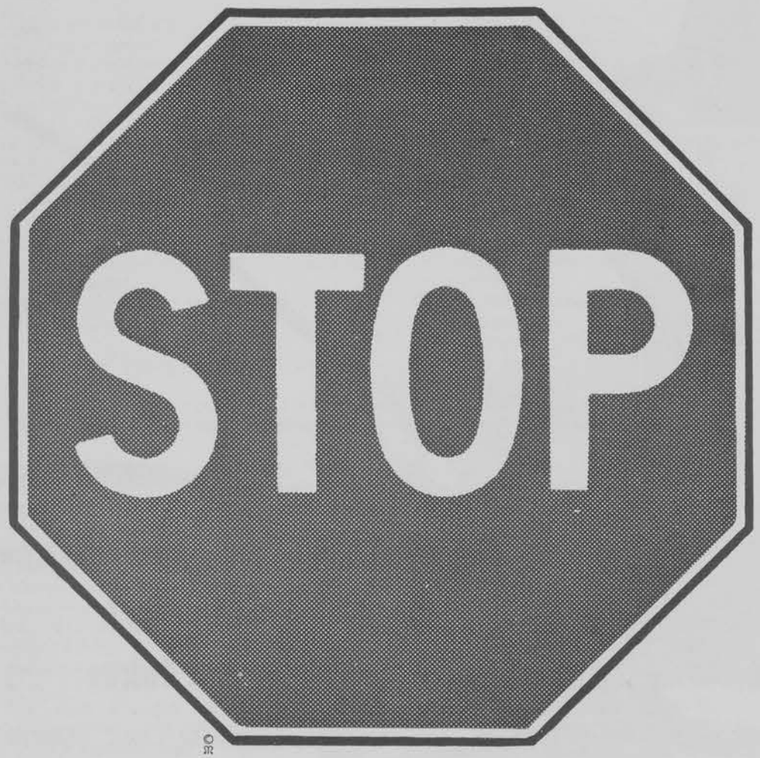
Water Pollution Education, Bob Ray and Willard Sevaner, Minnesota Pollution Control Agency.

Control of Aquatic Plants in Minnesota, Minnesota Conservation Dept., Div. of Game & Fish, Special Publication No. 39, Nov., 1968.

Key to the Common Aquatic Plants of Minnesota, Minnesota Conservation Dept., Div. of Game & Fish, Special Publication No. 53.

Fundamentals of Limnology, F. Ruttner, University of Toronoto Press, 1963, 295 p.

Ecology of Inland Waters and Estuaries, G. K. Reid, New York, Rheinhold, 1965, 375 p.



Stop signs are a traffic control device.
This Symposium should serve as a stop sign in water pollution control. Northern Natural Gas Company has long been a leader in pollution control and watches this meeting with great interest.

Northern Natural Gas

Serving The Detroit Lakes
Area Through The Peoples
Natural Gas Division

Water

must be

more than

wet

to be good . . .

Glenwood
INGLEWOOD
Glenwood at Thomas, Minneapolis, Minn. 55405

* Serving The Upper Midwest Since 1884

SPRING WATER

DISTILLED WATER

FLUORIDE SPRING WATER

A THING OF BEAUTY ISN'T NECESSARILY A JOY FOREVER. . . .

WE, TOO, ARE CONCERNED ABOUT PROTECTING THIS NATION'S NATURAL RESOURCES AND ENVIRONMENT.

WE ARE TRYING TO DO SOMETHING ABOUT IT IN OUR OWN WAY--BURYING OUR TELEPHONE CABLES, FOR EXAMPLE, SO THAT WHEN YOU DRIVE ALONG OUR HIGHWAYS OR BUY A HOME IN A NEW RESIDENTIAL AREA, YOUR VIEW WILL NOT BE OBSTRUCTED BY UNSIGHTLY POLES AND WIRES. OR INSTALLING EXHAUST CONTROL DEVICES ON OUR AUTOMOBILES AND TRUCKS SO THAT WHEN YOU TAKE A DEEP BREATH, THE AIR WILL BE PURE AND EXHILARATING. OR PARTICIPATING IN EFFORTS TO IMPROVE THE ENVIRONMENT IN OUR CITIES.

EACH PERSON OR COMPANY, IN ITS OWN WAY, MUST CONTRIBUTE TO MAINTAINING THE BEAUTY OF THIS COUNTRY THAT WE ALL LOVE. WE SALUTE YOU WHO ARE WORKING TO ELIMINATE WASTE AND DESTRUCTION OF OUR WATER RESOURCES SO THAT WE ALL CAN ENJOY THEIR BEAUTY AND PLENTY.

NORTHWESTERN BELL TELEPHONE COMPANY

League of Women Voters of Minnesota, 555 Wabasha Street, St. Paul, Mn. 55102
September 18, 1969

STATEMENT MADE BY MRS. O. J. JANSKI
LEAGUE OF WOMEN VOTERS OF MINNESOTA
AT A HEARING ON SEPTEMBER 22, 1969
BY THE MINNESOTA POLLUTION CONTRAOL AGENCY
IN THE STATE BOARD OF HEALTH BUILDING

We appreciate the opportunity to present this statement on behalf of the League of Women Voters of Minnesota.

As your members well know, we have attended and given statements at every hearing that has been held concerning both the Monticello and Prairie Island Plants since February, 1968. We have enclosed copies of those statements for your convenience, and particularly for your new mwmbers. Our beliefs remain as previously expressed, that no new permits be granted for construction of any type of nuclear plant, whether it be for initial construction, water use, or the actual operation of the atomic plant until adequate studies have been completed to determine the long-range effects of the plants already in operation.

We have one additional statement to make. We have attended all of the regular meetings of the Minnesota Pollution Control Agency since the first request for the thermal permit for Prairie Island was requested, and have repeatedly heard the report by the staff of the MPCA stated -- that no thermal permit be granted for Prairie Island separately from the atomic permit -- that the two be granted at the same time in a single permit.

We cannot understand why the members of this agency would not take the advice of the professional men who are hired by them, and who have the most intimate knowledge of the situation.

We strongly back the recommendation of Mr. Badalich, that no thermal permit be granted separately at this time.

League of Women Voters of Minnesota, 555 Wabasha Street, St. Paul, Mn. 55102

LEAGUE OF WOMEN VOTERS OF MINNESOTA
STATEMENT BY MRS. O. J. JANSKI, STATE PRESIDENT
SEPTEMBER 26, 1969
LAND AND WATER RESOURCES SUBCOMMITTEE
OF THE MINNESOTA HOUSE OF REPRESENTATIVES

After twelve years of study and action in the field of water management across the U.S., the League of Women Voters still finds that one of the nation's great domestic problems is securing water of needed quality and quantity and paying the cost of avoiding flood, drought and pollution. Some progress has been made; we think that the LWV and other citizens' groups have had a part in influencing its direction.

Last legislative session we combined our efforts with those of other organizations through the Minnesota Environmental Defense Council. This was the first time that such coordination existed. We were able to support actively all but one of the MEDC goals. They aimed for 1) mandatory waste water and water treatment plant operator training and certification, 2) state grant-in-aid programs to encourage municipalities to build new, or upgrade existing waste water treatment facilities, 3) public hearings and construction permits before the building of large water using facilities, 4) water user incentives, 5) ecologically oriented education programs in the schools, 6) effective flood plain zoning on a statewide basis and 7) a ban on the use, sale, manufacture and distribution of D.D.T. (Last was not actively supported by the LWV.) The general thrust was that water should be returned to lakes and rivers in a condition equal to, or better than, the condition in which it was withdrawn.

Though none of our goals was completely attained, significant advances were made. The legislature and the public are becoming aware of the problems.

We, the League of Women Voters of Minnesota, commend the 1969 session of the Minnesota Legislature for the enactment of the section of H.F. 2312 which requires the securing of a construction permit prior to beginning construction of large water-using facilities in the state. Many severe ecological problems could have been avoided in previous years had Minnesota possessed and enforced such a measure. Prior to enactment of this favorable legislation by you, large-volume water users used to begin construction of a facility, then after a substantial portion of the facility had been constructed, make application for a permit to withdraw water and apply for a permit to discharge wastes into the water. This placed the Minnesota Conservation Department (MCD) and the Pollution Control Agency in the position of being faced with a partially accomplished fact, substantial amounts of money invested in construction, materials and equipment. In addition, unfavorable waste treatment plans might be already well on the way to installation, or at least important fundamental parts of the waste system might already be too far along to be changed in manner that would be beneficial to the body of water to be used as a waste disposal. Enactment of the provision of H.F. 2312 dealing with this problem will go a long way toward correction of this problem.

The same legislation which brought the above-mentioned beneficial provisions also contained a section which could lead to a further degradation of the waters of the state. H.F. 2312 contained a provision specifying, "It shall

be the duty of each city, village, borough, county, town, sanitary district, public corporation, or other governmental subdivision to cooperate with the agency (Pollution Control Agency) in obtaining compliance with the provisions of Minnesota Statutes, Chapters 115 and 116 and to enforce within its jurisdiction all standards, orders, regulations, or permit requirements adopted by the agency thereunder."

It is entirely possible that political and industrial interests might exert strong pressures, making it difficult or impossible for local officials to enforce regulations on pollution abatement. This section of H.F. 2312 weakens the capability of the Pollution Control Agency to stop degradation of water resources and begin an effective program of enhancing those water resources.

Passage of H.F. 1675 authorized the preparation of an interdisciplinary program of instruction in the elementary and secondary schools of the state in environmental conservation education. This is a potentially important piece of legislation and its importance to the citizens of the state is very crucial. Interpretation of the legislation by the administrators will determine how effective H.F. 1675 will be in this important program. No money was appropriated to carry out the provisions of the act, hopefully this will be corrected early in 1971.

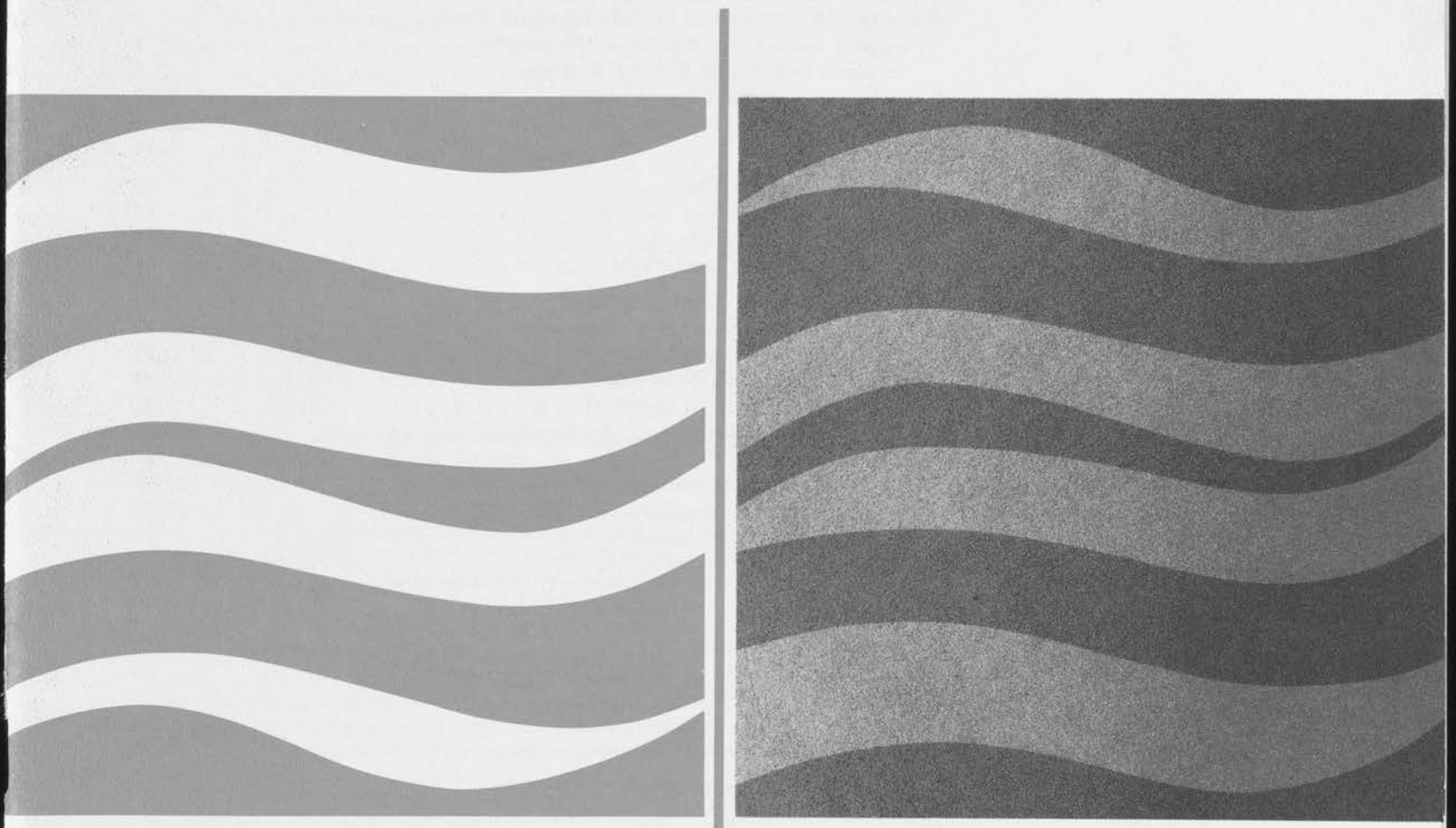
Legislation adding two members to the Pollution Control Agency, with the provision that one of the two members be from a particular polluting industry (in this case, agriculture) opens the door to requests from other pollution sources in society for their representative on the agency which is supposed to control pollution. This concept of representation by various polluters on the PCA was one of the important reasons why the old Water Pollution Control Commission was as ineffective as it was during its years of existence. Undoubtedly, Minnesota would not be faced with the large pollution problems it now faces had the WPCC, predecessor to the PCA, not been saddled with four of its seven members representing various sources of pollution in our state (livestock and sanitary board; department of agriculture; municipalities; industry).

As any experienced politician understands, a situation of the type cited above, inevitably winds up as a trading session to see that no one group will be penalized too severely. If we are hopeful of halting the degradation of our water resources and beginning an effective program of enhancement of those vital water resources, a pollution control body should be free of the kinds of political bargaining by polluting interests that can arise under the conditions which have been opened up under legislation, specifying that one member of the two new members of the PCA should be from a certain polluting segment of our society.

Through our 68 Leagues in Minnesota, we offer our help in educating the public to the needs of the kind of legislation necessary to preserve and enhance the water resources of Minnesota.

UNDERSTANDING THE WATER QUALITY CONTROVERSY IN MINNESOTA

JOHN J. WAELTI



Agricultural Extension Service
University of Minnesota

CONTENTS

Photo credits:

Federal Water Pollution Control Administration, pages 18, 21

League of Women Voters, page 13 (upper)

Charles S. Holt, Bemidji, pages 12, 13 (lower)

Lloyd Schallberg, Minneapolis, pages 4, 22,

Minnesota Pollution Control Agency, page 14

John J. Waelti is assistant professor, extension economist, and assistant to the director, Water Resources Research Center, University of Minnesota.

The author is indebted to personnel of the Federal Water Pollution Control Administration, the Minnesota Pollution Control Agency, and colleagues at the University of Minnesota whose cooperation aided the completion of this bulletin.

Financial support for the work on which this publication is based came in part from the U.S. Department of Interior as authorized under the Water Resources Research Act of 1964, Public Law 88-379.

Issued in furtherance of cooperative extension work in agriculture and home economics, acts of May 8 and June 30, 1914, in cooperation with the U.S. Department of Agriculture. Roland H. Abraham, Director of Agricultural Extension Service, University of Minnesota, St Paul, Minnesota 55101. 15M—10-69

"All the rivers run into the sea;
yet the sea is not full;
unto the place from whence the rivers come,
thither they return again."

Ecclesiastes 1:7

FOREWORD

Trying to siphon through the controversial, complex issues on which public decisions are (or perhaps are not) being made often leaves the individual citizen feeling frustrated and ineffective. The breakdown in communications between citizen and government, which may result from a feeling of being unable to significantly influence the decisions which so profoundly affect life, is not by intention or design of sinister forces, but is often the unfortunate consequence of the complex and technical nature of the questions involved.

Obtaining a working knowledge of a technical subject, such as water pollution, is difficult and certainly time consuming for the average citizen. Although in a democracy, public employees are elected and appointed to make certain decisions and perform functions which cannot be efficiently performed on an individual basis, overall goals and policy directions must reflect the will of the electorate. This publication is designed to assist Minnesotans in attaining an elementary understanding of some of the more important aspects of water pollution and to facilitate meaningful, rational debate and better communications between citizen and government — communication which is necessary if public policy is to accurately reflect citizen objectives.

No comprehensive policy suggestions for alleviating pollution problems are made in this publication. Instead, emphasis is on explaining the problems and organizing issues in such a manner that, from debate, sound public policy proposals can arise. Although effort was made to be objective and impartial, the reader will detect throughout the author's belief that more should be done about water pollution and more resources should be allocated to the problem's solution than presently is the case.

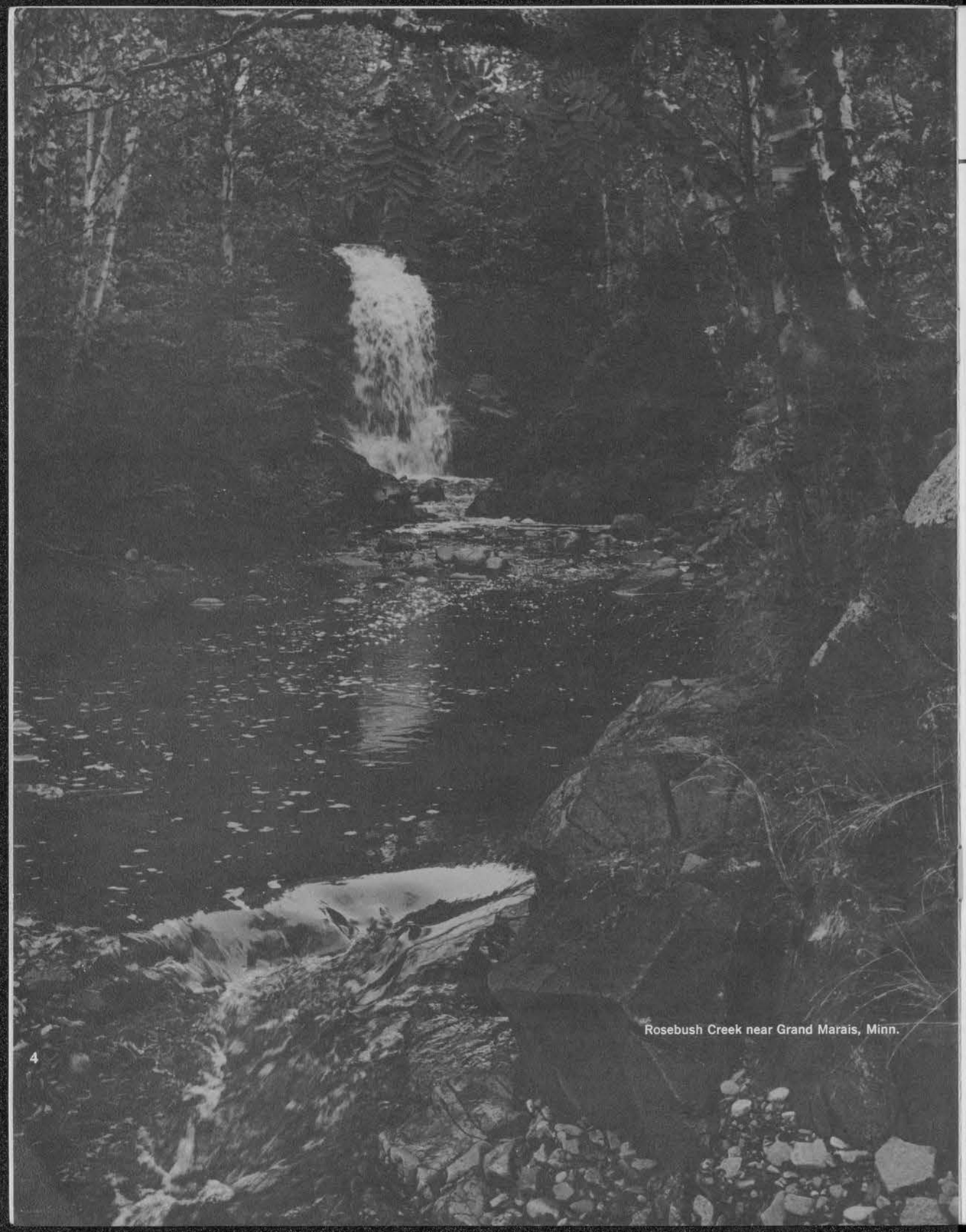
Every effort was made to state the subject matter as simply as possible while retaining a high degree of technical accuracy.

In recent years, there has been increasing public concern over the pollution of Minnesota's lakes and streams. The quality of water is an important facet of the quality of our total environment. Clean water, clean air, freedom from excessive noise, and adequate open space and recreational opportunities are among the conditions necessary for a healthful, pleasant environment.

A growing population with greater affluence, more leisure time, and greater mobility has imposed competing demands on the natural resources of Minnesota. Industrial development and urban growth have accelerated the deterioration of quality in Minnesota's lakes, streams, and ground water supplies. As a consequence of expanding demand, fresh water must be used and reused many times before it returns to oceans or to the hydrologic cycle. Each use generally results in deterioration of water quality.

The use of rivers and streams as sewers for dilution and transport of waste materials competes with their use as a source of municipal and industrial water supply, as a habitat for fish and wildlife, as a base for recreational activity which is extremely important to the economy of Minnesota, and as an aesthetic factor contributing to the general quality of our environment. The construction of homes and cottages adjacent to lakeshores accelerates the pollution of lakes. Urban growth patterns which discourage central sewage disposal systems often cause ground and surface water pollution.

Competition for limited resources gives rise to controversy — and even in Minnesota, which is generally viewed as a "water rich" state, water is sometimes a very limited resource depending on alternative uses.



Rosebush Creek near Grand Marais, Minn.

"Much water goeth by the mill that the miller knoweth not of" — John Heywood

Some Basics of Water Pollution

What Is Water Pollution?

It might at first appear that there is no question about the definition of the term "water pollution." However, there are a number of different kinds of pollutants which affect water in various ways.

The terms "contamination" and "pollution" are sometimes used interchangeably. Generally, "contamination" refers to an impairment of the quality of water by wastes, to the extent that a health hazard is created through poisoning or spread of disease. In contrast, "pollution" does not necessarily refer to a public health hazard, but means waters are adversely affected for domestic, industrial, agricultural, or recreational uses. Discussion throughout this publication will focus on the more general term of pollution, rather than contamination.

The term "pollution" often means different things to different people. A given body of water may or may not be "polluted" depending on actual or potential uses. Water which is of adequate quality for one purpose, irrigation, for example, may not be satisfactory for supporting game fish. Therefore, the various types of pollutants and their effects on water must be examined in light of intended or potential uses.

Classification of Pollutants

Although the most obvious signs of pollution include grease, oil slicks, floating solids, and offensive odors, there are many other forms of pollutants occurring in both solid and liquid form. *Pollutants in solid form* may consist of materials such as sand, gravel, soil, ashes, cinders, sludge or other solid sewage matter, any vegetable or other garbage, offal or parts of the carcass of any animal, rubber, wood, gelatin, and paper or paper pulp.

Pollution in liquid form occurs through discharge of municipal, industrial, and agricultural wastes into streams. Pollutants in liquid form may contain minerals in solution, dissolved material or suspended matter, and dissolved noxious gases. Material carried in stormwater runoff is another potential source of pollution.

Chemical pollution may occur in either organic or inorganic form. Organic chemical pollution results from discharge of municipal, industrial, and agricultural wastes including resins, coal, oil, tars, dyes, synthetic detergents, and toxic organic chemicals, such as DDT. A significant effect of organic matter of any kind is to reduce the dissolved oxygen content of the receiving water. However, some organic chemicals also have a toxic effect on fish and other aquatic life, and on bacteria which are useful in the decomposition of organic matter. Some synthetic detergents cause foam on water and may be toxic to aquatic life. Oils may form a film on the water surface, decreasing the oxygen-absorbing capacity of water. Oil in lakes and streams causes tainting of fish flesh, incapacitates water fowl, and seriously damages other aquatic life.

Inorganic chemical pollution may result from discharge of acids and alkalies, toxic inorganic compounds such as hydrogen sulfide and chlorine, and soluble salts such as nitrates, chlorides, sulphates, bicarbonates, phosphates, and metallic salts. Acids cause corrosion of metal and concrete structures, destroy useful bacteria, and are lethal to fish and other forms of aquatic life. Acids may react with sludge and river mud to form foul smelling hydrogen sulfide. Concentrations of ammonia, chlorine, cyanide, and salts of many metals such as copper, chromium, zinc, and nickel are toxic to fish and to bacteria which are useful in the decomposition of organic matter. Copper and zinc are especially toxic to fish. Some soluble salts, such as bicarbonates, sulphates, and chlorides of calcium and magnesium cause "hardness" in water leading to incrustation of pumps, pipelines, and other metal and concrete structures. Nitrates and phosphates enrich the water and foster algal growth. Radioactive materials are still another form of chemical pollutant.

Physical forms of pollution affect the color, turbidity, and temperature of water. Examples of *physical pollutants*

are solids and suspended matter, foam, froth, and scums. Suspended solids, including silt from land erosion, create turbidity which can damage fish and render water less desirable for municipal, industrial, and recreational uses. The larger suspended solids settle out, forming a sludge blanket along the stream bottom which may damage spawning beds and smother organisms useful as fish food. Sludge deposition may increase the need for dredging channels and reduces dissolved oxygen. An increase in water temperature, known as *thermal pollution,* reduces dissolved oxygen holding capacity of water and fosters algal growth. Power generating plants are the primary sources of discharges of heated water.

Biological pollutants include pathogenic (disease-producing) bacteria and protozoa, certain forms of fungi, algae, viruses, and parasitic worms. Some forms of bacteria provide a useful and necessary function in the breakdown of organic matter. However, the primary concern is with species causing water-borne diseases such as typhoid, dysentery, and cholera. Excessive growth of algae, another form of biological pollution, causes odors and nuisance conditions when plants die and decompose.

Common Chemical, Physical, and Biological Pollutants*

Chemical	Physical	Biological
Organic (carbon) compounds	Floating solids	Pathogenic bacteria and protozoa
Inorganic (mineral) compounds	Suspended matter	Viruses
Radioactive materials	Settleable matter	Parasitic worms
	Foam and froth	Algae
	Heat	Aquatic weeds

* Although many of these items occur in water as part of a natural cycle, excessive intrusion renders water less desirable for various uses.

Degradable and Nondegradable Pollutants

Although pollutants can be classified according to chemical, physical, and biological criteria, a very useful distinction is degradable and nondegradable pollutants. Some pollutants are broken down or decomposed by natural physical, biological, or chemical processes in water. These are referred to as degradable pollutants. Sometimes the term "biodegradable" (decomposition by biological processes) is used. Nondegradable pollutants are those not altered by the processes which occur in natural waters.

Nondegradable pollutants include inorganic chemicals such as chlorides, nitrates,[1] phosphates, sulphates, and various metallic salts. Another form of nondegradable pollutant is suspended matter such as silt. While most suspended materials eventually settle out, contributing to sludge problems referred to previously, colloidal material may remain, causing water turbidity or cloudiness.

Chemical compounds which are resistant to biological breakdown are sometimes called *hard chemicals.* Some detergents, resistant to biological breakdown, are known as *hard detergents.* They form froths when they mix with receiving waters. In recent years, the detergent industry has made commendable progress in manufacturing and marketing detergents which are degradable and do not cause frothing. (Nearly all detergents now on the market are soft detergents.)

Some pollutants are somewhat degradable, but because the process occurs so slowly, are for practical purposes classified as nondegradable. For example, the decay of some radioactive waste products is extremely slow. Some organic compounds, *hard* detergents and chlorinated hydrocarbons such as DDT, chlordane, and endrin, are extremely persistent in their resistance to decay.

In contrast to nondegradable pollutants, degradable pollutants are broken down by bacteria into nondegradable, relatively stable materials such as bicarbonates, nitrates, sulphates, and phosphates.

Degradable pollutants	Nondegradable or extremely decay resistant pollutants
Most organic matter	Certain forms of chemical elements
Oil and grease	Nitrates*
Soft detergents	Phosphates
Organic nitrogen, nitrites, and ammonia	Sulfates
	Metallic salts
Phenols	Chlorinated hydrocarbons
Cyanides	Colloidal matter
	Hard detergents

* Under some conditions, may be converted by bacteria to nitrites or to free nitrogen.

Natural and Manmade Pollution

Normally, it is desirable for water to be high in dissolved oxygen, low in temperature, low in minerals, salts, and chemicals which might affect taste, color, or odor; and free of excessive algae, weeds, or other plant life. The various pollutants which adversely affect these measures of quality result from natural forces and from activities of man.

Examples of natural sources of pollution include soil erosion and siltation, floods, and deposition of organic matter such as leaves, weeds, brush, and dead animals in waterways. Natural sources of pollution do not normally constitute a problem and are a part of a natural cycle in which waters are purified by natural biological processes. Activities of man upset the balance of this natural cycle by speeding up the natural forces of soil erosion and siltation. Foreign elements such as grease, oil, and synthetic chemical compounds are introduced and the load of organic matter from municipal, industrial, and agricultural sources is greatly increased. Man's activities often increase the rate of enrichment of lakes and streams and the rate of pollution of ground and surface water to the extent that natural processes are no longer able to absorb the pollutants introduced into the system.

[1] Strictly speaking, nitrates can under some conditions be chemically reduced by bacteria to nitrites and free nitrogen. However, the major portion of elemental nitrogen entering a water body as nitrites, ammonia, or nitrogenous organic matter normally is oxidized to nitrates and is potentially damaging to water quality.

"When we try to pick out anything by itself, we find it hitched to everything else in the universe." — John Muir

Important Problem Areas

Organic Matter, BOD, and Oxygen Sag

Of the various measures of water quality, one of the most important is dissolved oxygen, which is necessary for the existence of fish and other desirable aquatic life as well as for *self-purification* of streams.

Self-purification is the somewhat deceptive term used to denote the remarkable capacity of a freeflowing stream to reduce organic pollution through natural physical and biochemical processes. Micro-organisms, mainly bacteria which require dissolved oxygen in the water, utilize organic matter as food. The complex organic compounds are broken down to more simple end products. The process of breakdown of organic matter by oxgen-using bacteria is said to proceed *aerobically,* meaning *with oxygen.* The oxygen utilized by bacteria is replaced by *reaeration,* the absorption of air into the water, as the stream flows along, enabling continuation of the process of aerobic decomposition.

As long as available dissolved oxygen in the water is not used up, aerobic breakdown of organic matter proceeds. However, if the load of organic matter is heavy, oxygen will be used up at a faster rate than it can be replenished. If these conditions continue long enough, the level of dissolved oxygen drops to zero. When dissolved oxygen is depleted, aerobic decomposition no longer can occur and decomposition then must proceed *anaerobically,* meaning *without oxygen.* Disagreeable conditions accompanying anaerobic decomposition are masses of floating sludge, production of offensive gases such as hydrogen sulfide, and death of fish and other desirable aquatic life.

The term *biochemical oxygen demand,* called *BOD,* refers to the amount of dissolved oxygen required by bacteria when breaking down decomposable organic matter under aerobic conditions.[2] BOD thus indicates sewage load; a larger discharge of sewage will require a larger amount of oxygen for decomposition.

The level of dissolved oxygen in a stream depends on the rate of reaeration, and the rate of utilization by micro-organisms.[3] Since the removal of oxygen from water resulting from aerobic decomposition of organic wastes takes time, the low level of dissolved oxygen occurs some distance downstream from the point of waste discharge.

The so-called *oxygen sag curve* is illustrated in figure 1. The rate of oxygen use initially exceeds the rate of reaeration, causing a decline in the level of dissolved oxygen. After partial decomposition of the oxygen-depleting wastes, the rate of oxygen gain through reaeration exceeds the rate of ultilization, enabling an increase in dissolved oxygen. If the sewage load is particularly heavy relative to the oxygen-holding capacity of the stream, the level of dissolved oxygen may drop to zero, causing *anaerobic conditions* as in figure 2.

The combined rate of oxygen utilization and reaeration depends on many factors, including the strength and volume of the discharge of organic matter, the nature of the organic matter (compounds such as cellulose are not as readily decomposed as most other organic compounds), the physical characteristics of the stream, water temperature, and kind and number of micro-organisms present in the waste discharge.

In general, factors which tend to slow down the rate of oxygen utilization tend to flatten and lengthen the oxygen sag curve. The *rate* of oxygen depletion under aerobic decomposition is higher in warm than in cold water. Similarly the oxygen-holding capacity of warm is lower than cold water which, when combined with the faster rate of oxygen utilization in warm water, and low summer flows, causes greater danger of low oxygen levels in summer than in winter. In figure 3, curve A represents an oxygen sag curve in summer relative to that resulting

[2] The standard BOD test is based on the *amount* of oxygen used in aerobic decomposition over a 5-day period. Thus, BOD is technically a *rate* of oxygen utilization. With the time being understood as 5 days, the *rate* becomes an *amount.*

[3] Some oxygen also results from photosynthesis by algae in the water.

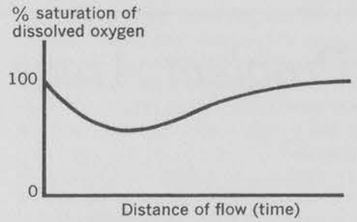


Figure 1. Typical oxygen sag curve.

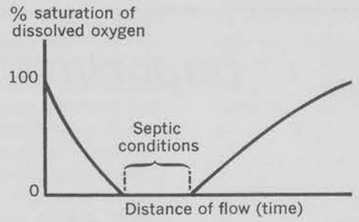


Figure 2. Septic conditions in an oxygen sag curve.

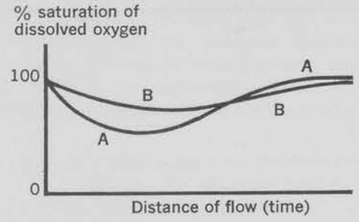


Figure 3. Oxygen sag curves under differing stream conditions.

from an equivalent waste discharge in winter, represented by curve B. Note the more rapid recovery of curve A following a sharper initial decline in dissolved oxygen.

A very turbulent, rapidly moving stream has greater oxygen-absorbing capacity than a slowly moving stream, other factors such as volume of water and temperature being equal. A given volume of water with a large surface area will be reaerated faster than the same volume of water with less surface exposure, all other factors being equal, and thus have greater self-purification capacity.

The typical oxygen sag curve with one sewage outfall is changed by the addition of other outfalls and factors such as locks, dams, and falls. The diagram of the level of dissolved oxygen at various points in a stream is known as the *oxygen profile*. Figure 4 shows the oxygen profile for a portion of the Mississippi River in 1964-65. Note the oxygen sag occurring immediately after sewage outfalls, and the sudden increase in dissolved oxygen resulting from reaeration below locks and dams.

The oxygen-holding capacity of clean water varies from 7.6 mg. per liter at 86° F. to 14.6 mg. per liter at 32° F. Game fish require at least 5 mg. per liter and rough fish from 3-4 mg. per liter for propagation.

A major purpose of sewage treatment facilities is to accelerate decomposition of organic matter so that a substantial portion of the decomposition process has already been achieved before discharge into a stream. The greater the portion of decomposition that is completed in a waste treatment plant, the smaller the amount of dissolved oxygen required to complete the process when the effluent is discharged into a stream.

There are three stages of sewage treatment.

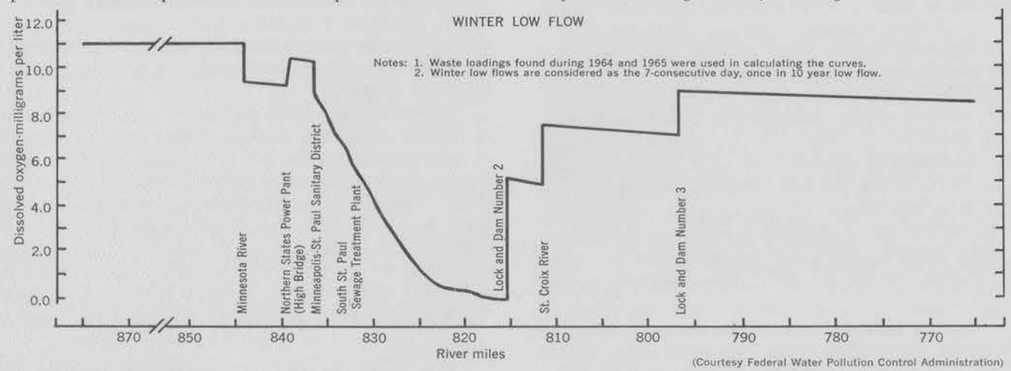
Primary treatment refers to the settling out of the larger suspended solids by screening and sedimentation before either discharging it or subjecting it to further treatment. Primary treatment normally accounts for about 40 percent BOD removal.

Secondary treatment refers to additional treatment by biological processes to break down organic matter remaining in the sewage. Secondary treatment can remove an additional 45-55 percent of the BOD for a total of 85-95 percent BOD removal. The greater the BOD removal, the higher is the cost. Costs mount rapidly when 90 percent BOD removal is approached.

Effluent from primary and secondary sewage treatment is usually chlorinated before discharge to kill *pathogenic* or disease-producing bacteria which might be present.

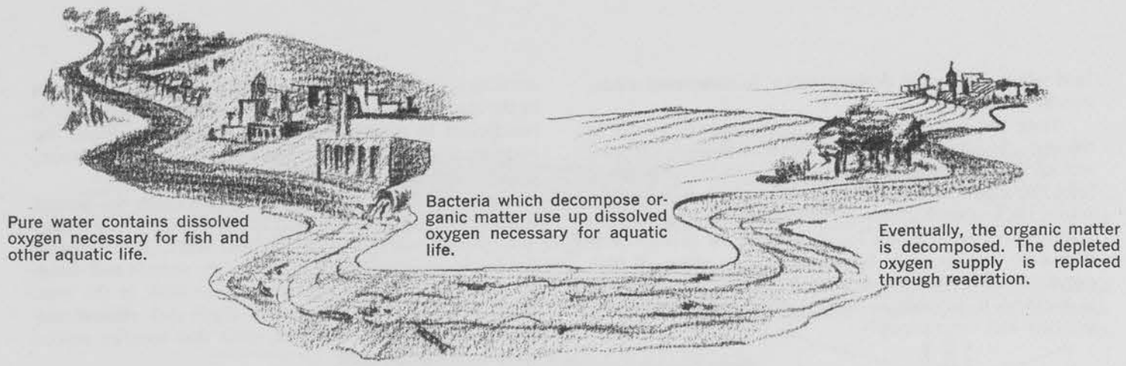
Tertiary treatment refers to treatment of sewage beyond the secondary stage to accomplish a very high degree of BOD and/or nutrient reduction.

Much of the controversy regarding water quality concerns the degree to which sewage should be treated before discharge into streams and who should pay the treatment cost. In the Twin Cities, there is additional controversy among various governmental units regarding financing and cooperative arrangements for sewage treatment.



(Courtesy Federal Water Pollution Control Administration)

Figure 4. Oxygen profile of the Mississippi River, Twin Cities area.



WATER QUALITY PROBLEMS IN DENSELY POPULATED AREAS

Existing Facilities in Minnesota Municipalities

Sewage disposal problems are an important part of the larger problem of water quality control. Inadequate sewage disposal facilities sometimes cause pollution of ground water as well as surface water and pose especially difficult problems in urban and other densely populated areas.

The normal means of collection and treatment of sewage in urban areas is through a system of mains which convey sewage to a central treatment plant. At the plant, sewage is given secondary and/or primary treatment and usually discharged into a stream.

As shown in table 1, over 75 percent of Minnesota's population is served by municipal sewer systems. However, nearly 15,000 people are served by a sewer system which does not have treatment facilities, and over a quarter million people are served by a primary treatment system only.

Twenty percent of Minnesota's residents live outside municipalities, and in most rural areas central sewage collection and disposal facilities are not necessary or feasible. However, congested areas, such as lake fronts which do not have central sewage systems, either have experienced serious pollution problems or have this potential as will be discussed in the section on Eutrophication and Pollution of Lakes.

Table 1. Waste treatment facilities in Minnesota

Treatment	No. of municipalities	Population	Percent of population
No sewer system	340	151,399	4.4
Sewer system, but no treatment facilities	26	14,694	0.4
Sewer system and primary treatment only	55	237,084	6.9
Sewer system and secondary* treatment (378 plants)	431	2,339,300	68.5
Population outside municipalities	...	671,387	19.8
TOTAL	852	3,413,864	100.0

* These figures include 43 municipalities with sewer systems tributary to the Minneapolis-St. Paul Sanitary District Sewage treatment plant. Source: Minnesota Pollution Control Agency. 1968.

Problems With Onsite Disposal Systems

Considerable controversy may center on the matter of providing sewage disposal facilities for newly developing areas. Before World War II, when urban growth was relatively slow and orderly, most new construction simply relied on an extension of existing urban services, including water and sewer lines. Most new areas closely resembled the existing city and the small amount of development that occurred in unserviced areas was usually in the form of widely scattered, individually built homes.

After World War II, however, there was an extremely large unfilled demand for new housing for which cities were generally not able to provide the necessary public services. Because of lower cost land, the availability of Federal Housing Administration (FHA) and Veterans Administration (VA) mortgage guarantees for new housing, absence of building regulations, and increased mobility provided by automobiles, much of the new housing was constructed beyond the areas served by central water and sewer systems.[4]

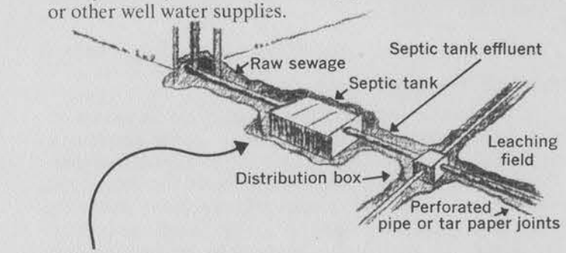
In the absence of sewer and water mains, it became necessary to find alternative ways to provide sewage disposal facilities and water supplies to new developments. At first, individual wells and septic tanks were used. While such facilities are suitable for farms and individual scattered homes, they are not satisfactory for densely populated areas.

In the septic tank method of onsite sewage disposal, the larger solids are separated from the liquids. The effluent which contains organic matter, partially decomposed under *anaerobic conditions* in the tank, is discharged into the subsoil through either a seepage pit or a system of perforated pipes called a leaching field. Although the sewage undergoes some biological decomposition in passing through the tank, a high degree of bacterial removal is not accomplished and pathogenic bacteria may still be present. Organic matter and nutrients also remain in the effluent. The primary purpose of the tank is to condition the sewage by removing solids so that it can pass through the disposal

[4] Eligibility for FHA and VA *new* construction home loans in developing or developed areas now generally requires that the house be connected to public sewage and water systems. For *existing* construction, water supply tests are required if the house is not connected to central water and sewage facilities.

field where biological decomposition is completed under *aerobic conditions.*

Since the actual purification of the sewage occurs in the soil, the effectiveness of the system depends on local soil characteristics. Where there are adverse conditions, including clay soils not conducive to seepage, high ground water, or bed rock close to the surface, the septic tank system of disposal is not satisfactory. Even in soils conducive to seepage, it is not satisfactory in areas of high population density because eventually, the ground water is displaced by effluent which may get back into individual or other well water supplies.



LONGITUDINAL SECTION OF A SEPTIC TANK

When locating a septic tank, careful attention must be given to the soil's capacity to absorb the effluent. Because of the possibility of ground and surface water contamination and the limited capacity of any soil to absorb sewage, septic tank systems are only suitable for isolated farmsteads and single family dwellings at low density. In areas with the most favorable soil and ground water conditions, a density of one or two homes per acre could be adequately sewered by septic tanks for years.

A report by the Twin Cities Metropolitan Planning Commission[5] observed:

1. Septic tanks do not provide a satisfactory solution to the sewage disposal needs in any area where the housing density exceeds two homes per acre.

2. In areas with lower densities, soil tests and other investigations are required to determine whether a septic tank should be used on a specific site.

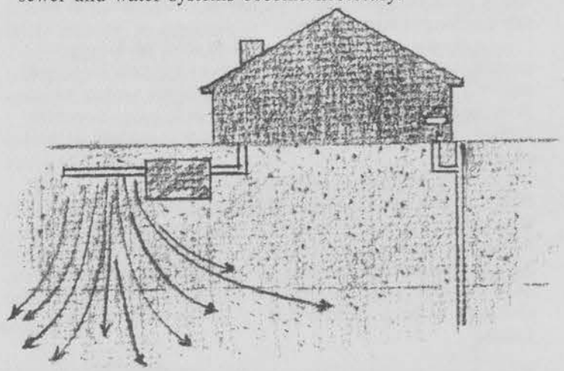
There are still some people in the Twin Cities metropolitan area who obtain their water from household wells and dispose of their sewage through septic tanks, both located on the same lot.

There are several good reasons for the construction of sewer and water systems instead of septic tanks and wells. If a community originally served by septic tanks constructs sewers but continues to rely on household wells, there still remains a danger of pollution from the residual pollutants in the soil. Also, in some areas, the natural ground water is insufficient to meet the water requirements without the addition of sewage effluent. Then it may become necessary to deepen wells after sewers are built.

In some areas having a high water table, the ground cannot absorb the effluent load safely, especially after water is no longer removed by household wells. This situation can result in sewage being forced to the surface and draining into natural water courses, or into wells in the area. There is the potential danger that septic tank effluent may pollute water in the deep rock strata that supplies central drinking water systems.

In an effort to delay the need for sewer systems, local ordinance has sometimes limited the number of homes constructed in a given area, assuming that septic tank systems will be satisfactory if density is kept low enough. This policy has sometimes had the adverse effect of delaying central sewer systems because of the increased per unit cost of sewer extensions with lower density housing.

To insure the protection of ground water supplies, it appears that all urban areas must be sewered, even though financial costs may be high. Stringent building and subdivision regulations would help to prevent wasteful practices such as an instance of a home owner having to abandon ineffective onsite septic tank-well facilities when public sewer and water systems become necessary.



Septic tank effluent sometimes pollutes drinking water.

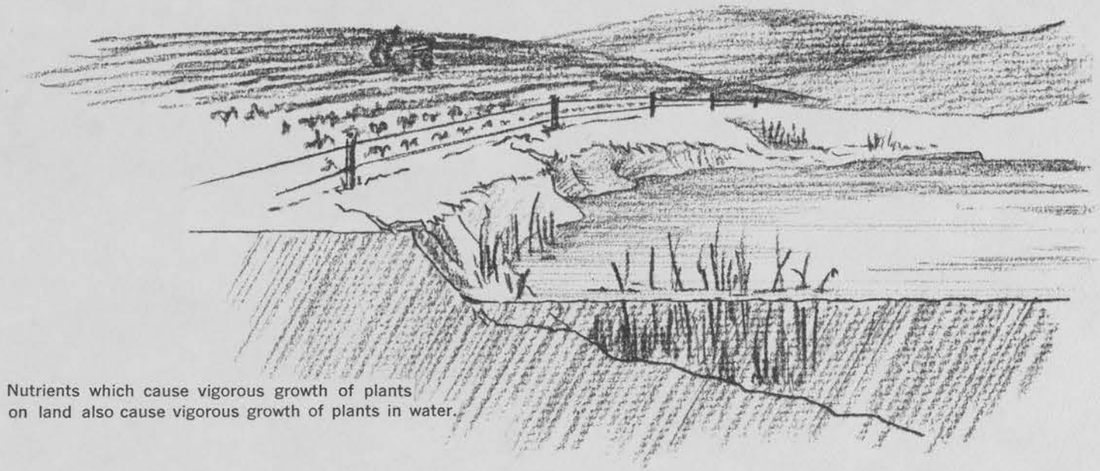
Eutrophication and Pollution of Lakes*

Lakes are generally more sensitive to pollution than flowing streams and present problems not encountered in streams. The relatively still waters of lakes provide a habitat for microscopic, free-floating algae which cannot thrive in rapidly flowing waters.

Because algae are the ultimate source of food for fish and other aquatic organisms, it is essential that some algae be present. However, a problem arises when large influxes

[5] Twin Cities Metropolitan Planning Commission, "Metropolitan Sewage Study," Metropolitan Planning Rpt. No. 7, Aug. 1960.

* The author is grateful to Robert O. Megard, Limnological Research Center, University of Minnesota, who provided valuable technical assistance for this section.



Nutrients which cause vigorous growth of plants on land also cause vigorous growth of plants in water.

of nutrients, such as nitrogen and phosphorus, stimulate algal growth. *Nutrients which enable vigorous growth of plants on land also enable vigorous growth of plants in water.*

With rapid enrichment of lakes by nutrients, the types of algae that are favored are those that form large, visible colonies that float on the surface and accumulate on beaches. Large quantities of organic matter are produced and, when decaying, cause noxious odors and deplete the water's oxygen supply. These enriched lakes are less desirable for recreational activities and harbor a greater proportion of rough fish than game fish.

Enriched lakes of this type are called *eutrophic,* which literally means "well nourished." The *process* of enrichment is called *eutrophication.*

Lakes undergo eutrophication naturally as they age and the basin becomes filled with sediment. This type of eutrophication occurs slowly and imperceptibly over a span of thousands of years. In contrast to eutrophication under natural processes, the activities of man can increase the rate of enrichment to the extent that visible and disturbing change may occur in less than a decade.

Runoff from land on which commercial fertilizers or animal manures have been spread contains nutrients in solution and, sometimes, organic matter in which these nutrients remain upon decomposition. (Runoff from unfertilized land, as well, contains some amount of nitrogen and phosphorus.) Effluent from septic tanks and wastes from municipalities and industries that drain into lakes are other sources of nutrients directly attributable to man's activities.

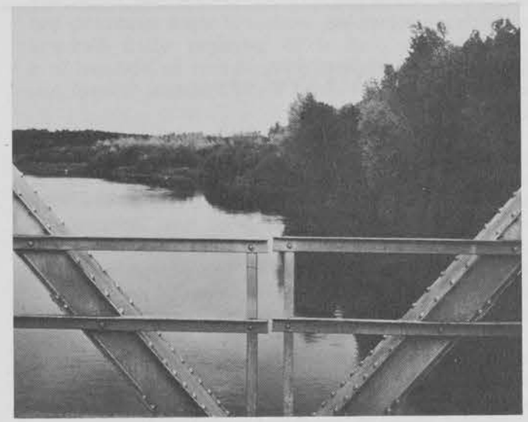
Algal growth is inhibited by low temperature and lack of sunlight. For these reasons, deep lakes containing large volumes of water in cooler climates, age less rapidly than smaller, shallow lakes in warmer climates. The shallowest of the Great Lakes, Lake Erie, has been most affected by eutrophication, and Lake Superior, the largest and deepest, least affected. Many smaller lakes in Minnesota, particularly those in the southwest are in an advanced state of eutrophication. Larger lakes adjacent to Twin Cities urban development, such as Lake Minnetonka, have also been affected. Most alarming, however, is increasing weed and algal growth even in some lakes in sparsely populated resort areas of the state.

Soft water lakes are generally more susceptible to eutrophication than hard water lakes. This is particularly relevant as some of the lakes and streams in Minnesota's most scenic recreational lands, such as the Boundary Waters Canoe Area, contain soft water. Recognizing the tendency toward pollution, the U.S. Forest Service is conducting a special program of instruction for campers on disposal of wastes to minimize damage to lakes and the environment.[6]

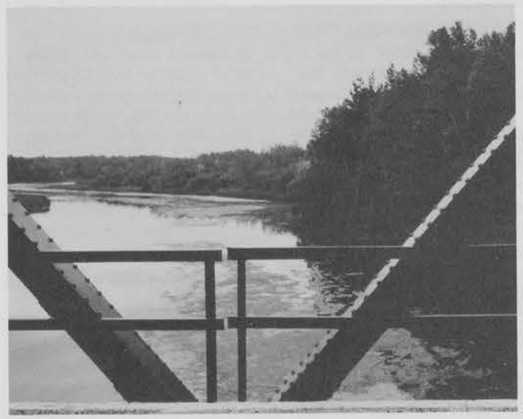
To prevent nutrients from entering lakes, it will be necessary in many areas to remove dissolved minerals from sewage effluent. This process, under present technology, is costly compared with conventional treatment. However, to ensure preservation of Minnesota's lakes, more resources must be devoted to this purpose. (One estimate is 4 to 5 cents per 1,000 gallons treated for removal of phosphates. A limitation is that such treatment is not feasible with the septic tank method of disposal and requires the existence of a system of mains and a central treatment plant.)

[6] The necessity of proper waste disposal by campers and other visitors to the Boundary Waters Canoe Area (BWCA) is dramatized by the fact that the waste load over a year is equivalent to a day's production of raw sewage in Milwaukee, Wisconsin. The reader who is interested in reading more about water quality in the BWCA is referred to Michael A. Barton, "Waters of the Canoe Country," *Naturalist,* Vol. 20, No. 1, 1969.

Sewer line and pollution near Mississippi River headwaters.



View of the Mississippi River 14 years apart (1954, above; 1968, below). Note the increased algal growth by 1968.



Sewage or sewage effluent is sometimes transported completely outside the drainage area of a lake to slow down the process of eutrophication. For example, Lake Tahoe, in California's Sierra Nevada Mountains, has experienced some algal blooms as a result of enrichment caused by sewage and septic tank effluent and runoff from fertilized lawns and golf courses. The proposed solution is to collect sewage from lakefront homes and commercial enterprises through a system of mains, give the sewage tertiary treatment, and transport it out of the basin.[7]

A critical matter relating to lake pollution is that Minnesota has no statewide regulations concerning placement of septic tanks on lake lots. However, a bill passed by the legislature provides for the mandatory adoption of zoning standards for lakeshore development by all of the counties by 1972 (see footnote 27).

[7] California Assembly Committee on Water, "New Horizons in California Water Development: A Report of the Assembly Interim Committee on Water," Vol. 26, No. 16, Sacramento, 1966.

Agricultural Pollution Problems *

In the past, serious pollution problems were associated primarily with densely populated areas. Recently, however, there has been increasing concern over the pollution caused by various agricultural wastes. The contribution of commercial and natural fertilizers and soil erosion to sedimentation and eutrophication of lakes has already been mentioned. However, there are additional problem areas.

The rapidly increasing agricultural production which enables the abundant, varied, low cost food supply enjoyed by the people of the United States results in part from increased use of pesticides.[8]

Many pesticides are synthetic organic chemical compounds which are included in a broad class, chlorinated hydrocarbons. Many chlorinated hydrocarbons, including DDT, endrin, and dieldrin, break down very slowly.

Most fish species are highly susceptible to chlorinated hydrocarbon pesticides. The order of toxicity to most fish among chlorinated hydrocarbons is as follows: endrin, toxaphene, dieldrin, aldrin, DDT, heptachlor, chlordane, methoxychlor, and lindane. (Greater concern over DDT is probably attributable to its common use.) In addition, fish may concentrate these compounds from organisms in the natural food chain in water because this class of pesticides has a high affinity for lipids or fats. Because of the persistence of compounds such as chlorinated hydrocarbons in the environment, and the unknown potential harmful effects, research is urgently needed to find effective pesticides which break down more rapidly.[9] In 1967, pesticides were identified as the source of at least 32 fish kills, including one in Minnesota.[10]

Another increasingly serious problem area is pollution from animal manures from feedlots. As long as animals graze freely over extensive areas, there is no significant problem involved. However, confinement of animals creates a concentration of wastes in small areas. When these wastes are washed into waterways by heavy rains, a sudden demand for dissolved oxygen is created.

Feedlot pollution was listed as the cause of three major fish kills in 1967,[11] although none was reported in Minnesota from this source. In addition to lowering dissolved

* The author is grateful to Laurence K. Cutkomp, Department of Entomology, Fisheries, and Wildlife, University of Minnesota, who provided valuable technical advice on the effect of pesticides for this section.

[8] The term pesticides is inclusive of a broad class of agents including insecticides, herbicides, fungicides, algicides, nematocides, and rodenticides.

[9] A source of technical information on the subject of pesticide levels relative to man and his environment is the *Pesticide Monitoring Journal,* a quarterly published by the U.S. Public Health Service.

[10] Federal Water Pollution Control Administration, "Pollution Caused Fish Kills," 1967, Eighth Annual Report, p. 9. The incident in Minnesota resulted following the use of an algicide (an agent designed to kill algae) in a lake. There is some question as to whether the fish died as a result of the chemical or as a result of oxygen depletion when the algae decomposed.

[11] Federal Water Pollution Control Agency, op. cit., p. 3. According to the report, two of the fish kills from cattle feedlots occurred in Kansas and one in Texas.

oxygen, the nutrients contained in feedlot wastes contribute to eutrophication. Research is needed to find economical methods of minimizing the pollution from wastes of farm animals.[12]

Industrial Pollution

There are an estimated 930 Minnesota industries which discharge wastes. These represent industries such as paper production, iron ore processing, oil refining, vegetable processing, sugar production, rendering, meat and poultry processing, milk processing, and power production. The nature of industrial wastes varies greatly within an industry and from industry to industry.

Industrial pollution was the leading source of fish kills nationally in 1967. Of four reported incidents in Minnesota, three were caused by industrial pollution.[13]

In the Twin Cities area, including the Mississippi River from Anoka to Lake Pepin, and the Minnesota River from Mankato to its meeting with the Mississippi, there are over 300 industries with waste discharges, most of which are connected to municipal facilities. Information concerning production, employment, method of waste treatment, and estimated waste load of 33 industries which discharge wastes directly into water courses may be obtained in a recent report of the Federal Water Pollution Control Administration.[14]

Industrial wastes may be detrimental to waters in sparsely populated areas, such as northern portions of the state where high water quality is crucial to the vitality of the tourist industry. Paper mill wastes can be especially damaging. However, an example of how industrial responsibility is being assumed is a northern Minnesota paper company which is building special treatment plant facilities designed to eliminate objectionable material from its waste discharges to the Mississippi River.[15]

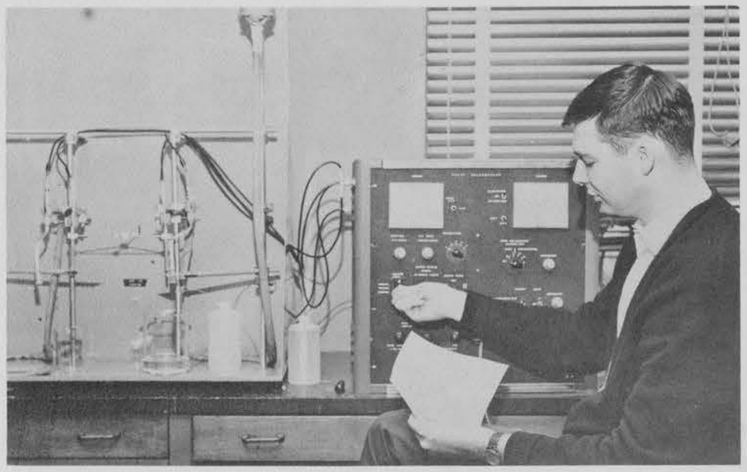
Included in the controversial areas of industrial pollution are the extent to which industries should be required to treat wastes and the kind of incentives or persuasion that is best used to attain objectives. Where industries are discharging wastes to municipal treatment facilities, controversy may be over the proportion of costs the industry should pay.

[12] A nine member Agricultural Advisory Commission has been created to advise the Minnesota Pollution Control Agency on coping with animal waste problems. Some work on this problem is also being conducted in the Department of Agricultural Engineering, University of Minnesota. The University's Institute of Agriculture is devoting increasing resources to solving problems of environmental quality.

[13] U.S. Federal Water Pollution Control Administration, op. cit. p. 3.

[14] U.S. Federal Water Pollution Control Administration, "A Report on Pollution of the Upper Mississippi River and Major Tributaries," July 1966.

[15] Progress toward this goal, involving the construction of an industrial waste treatment system, has been enabled by the Company, the Village of Grand Rapids, the Minnesota Pollution Control Agency, and the Economic Development Administration of the U.S. Department of Commerce.



Minnesota Pollution Control Agency research scientist David Gray adjusts the pulse polarograph which he built. The new instrument detects toxins and pollutants in water, air, blood, and urine in a fraction of the time of gas chromatography.

"There are few, if any, useful ideas in economics that cannot be expressed in clear English." — John Kenneth Galbraith

Economic Aspects of Water Pollution

Loss of Economic Product

The losses resulting from water pollution represent economic losses to society. High water temperature, unfavorable pH or acid balance, and low dissolved oxygen either directly cause fish kill or increase the sensitivity of fish to toxic substances in the water. Other forms of pollution, such as floating solids and debris, foam from detergents, organic dyes, grease and oil slicks, and odors are offensive and make water undesirable for recreation. Intensive algal growth makes water less desirable for swimming, fishing, and other types of recreation.

The value of these lost activities to society is substantial. Although activities such as recreation are not measured by market prices, they are as important in the spectrum of human wants and needs as if they were measured by market prices, and must be considered in public decisions. There have been no estimates made of the loss of economic product attributable to water pollution in Minnesota, but the losses are surely substantial.

In addition to the loss of economic product to society in general, a deterioration in water quality could adversely affect the state economy, especially those northern and central counties heavily dependent on tourism. Minnesota tourism receipts approximate $500-$600 million per year. Statewide, receipts support more than 600 hotels, 900 motels, and 3,000 resorts. A substantial portion of these receipts depends on the high quality, appealing environment which attracts vacationers to Minnesota.

Misallocation of Resources

Less obvious than the direct loss of economic product to society or loss of income to a region is the effect of water pollution on the allocation of resources. A major strength of the American economic system is the efficiency with which resources are allocated through the price and market mechanism. The efficient functioning of a price and market system is based on the assumption that all costs and benefits of decisions are realized by the decision maker. However, where outcomes of decisions are realized by someone other than the decision maker, an inefficient allocation of resources occurs.

As an example, consider a factory or municipality discharging wastes into a stream. In the absence of regulations or a sense of social responsibility, the industry's decision concerning the treatment of wastes is based on its profit and loss, and a municipality's decision is based on available public revenue. Under these conditions, it is in the decision maker's *shortrun* interest to spend as little on waste treatment as possible.

This decision, *based on shortrun interests,* causes a deterioration in water quality and has two sets of economic consequences. First, a cost is imposed on downstream users, forcing them to bear additional costs to treat the water or to forego its use altogether.[16] There is a direct loss to society as the stream will be less desirable for fishing and other forms of recreation. Costs which are incurred by a single decision unit and shifted to society as a whole are referred to by economists as *social costs.*

The second set of consequences is relevant to pricing and output of goods, when this production results in water pollution. With an industrial polluter, the total costs of production are not absorbed by the producer. That is, the costs of water pollution are shifted to society as a whole, enabling that particular product to be produced "artificially cheap" compared with production costs occurring if the waste discharger were forced to absorb all costs of pro-

[16] Recent research has shown that although low quality water is more costly to use for municipal purposes, on strictly monetary grounds, it is "cheaper" to utilize the self-purification potential of the stream and treat water at the intake point rather than give sewage a high degree of treatment. The practical implication of this conclusion is that sewage treatment and high water quality standards must be justified largely on recreational and esthetic grounds. See for example Richard D. Frankel, "Water Quality Management Engineering — Economic Factors in Municipal Waste Disposal." *Water Resources Research,* Vol. 1, No. 2. American Geophysical Union, 1965.

duction including costs of treating the wastes. *The net result is that more resources are devoted to the production of such products and less to water quality control. If in polluting a stream the polluter was harming itself, rather than recreational areas, more resources might be allocated to water quality control.*

An analogy can be drawn for a municipality. The costs of releasing untreated wastes are imposed on downstream users. The costs of sewage disposal to the municipality are "artificially cheap" and result in too few resources devoted to water pollution control.

Consider the problem in another way. A price and market system is a sound basis for many pricing and production decisions required in an advanced industrial economy. However, it must be recognized that not all costs and benefits are registered through the price system. This may result in underproduction of some goods, such as water pollution control facilities, relative to amounts desired by society. Where the price and market system does not result in the level of production of such goods in the amounts desired by society, or where services can be more economically provided by the public sector, there is reason for public direction and responsibility.

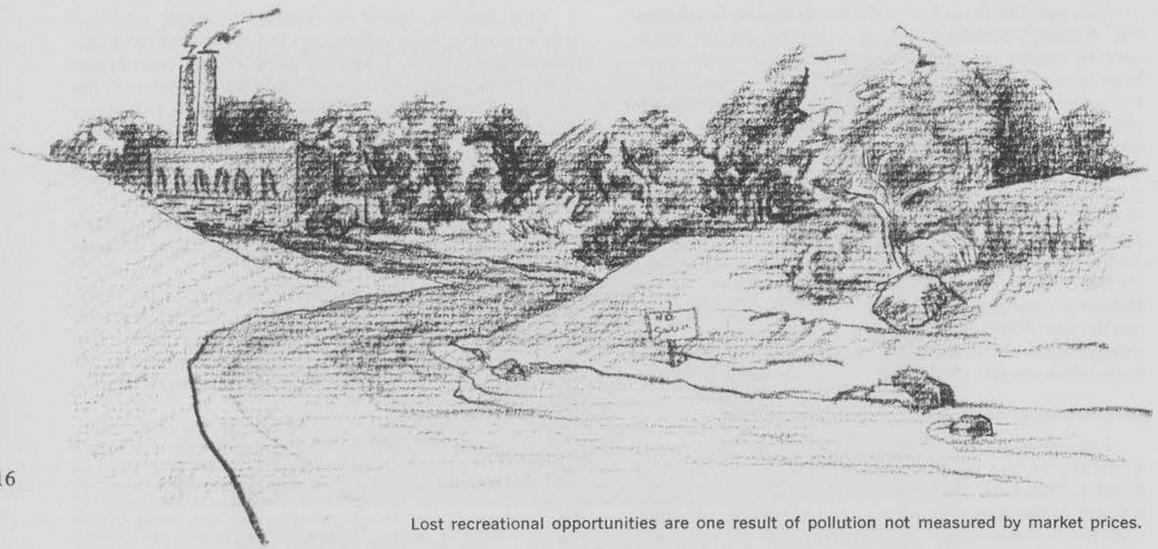
Considering water quality control, this may take the form of changes in laws that require waste dischargers to absorb costs of waste treatment, or the levy of taxes which enable a public agency to directly perform waste treatment and pollution control functions, or a combination of these measures.

Social and Aesthetic Considerations

In addition to the direct loss of economic product and the misallocation of resources resulting from water pollution, there are values which are not strictly economic. Even if a person never fishes or swims in a lake, he may derive a certain amount of satisfaction just from knowing that the lake is there for him to enjoy should he decide to take advantage of it.

The availability of water suitable for recreation may be especially important in congested, low income urban areas where recreational sites are in short supply. Much of the development of outdoor recreation has occurred some distance from the largest population centers. However, these areas are primarily available to people with sufficient income and mobility to travel considerable distances. If society is going to provide needed recreational and scenic resources for people in low income urban areas, the potential opportunities associated with riverfront areas in central cities must be realized.

Although the tools of economics cannot measure the social values of a clean, attractive lake or stream, these values must be considered in the political processes by which laws and regulations regarding pollution control are passed and enforced. *While it is not clear whether society is willing to pay for these values, it would appear that an affluent society is increasingly able to do so.*



Lost recreational opportunities are one result of pollution not measured by market prices.

"Government is a contrivance of human wisdom to provide for human wants." — Edmund Burke

Governmental Responsibility in Water Quality Control

PHILOSOPHY AND OBJECTIVES OF GOVERNMENTAL RESPONSIBILITY

Bases of Public Responsibility

It is generally agreed that there is some basis for governmental responsibility in the field of water quality control, but controversy arises over the degree of responsibility, the level at which it should be assumed, and how it should be exercised. The activities of government in the area of water quality control generally center around the provision of public goods and the establishment of rules and regulations to maintain water quality. Both of these bases of responsibility can be illustrated by the patterns of municipal sewage treatment that have existed in the past.

The history of sewage disposal in the Twin Cities is typical of other areas in Minnesota and across the nation. In the early days of settlement, disposal of wastes was left to the individual. After the Civil War, public collection systems were begun, but no treatment facilities were included. Raw sewage was discharged directly into the Mississippi River. Few people had enough leisure time to be concerned about recreation, and as long as population remained low, a degree of river pollution was tolerated.

However, as population, industrial development, and the level of pollution increased after 1900, the bad smelling river became intolerable. Citizens avoided the riverfront and both property values and tax revenue fell along the river. In the 1930's the Minneapolis-St. Paul Sanitary District was established and the construction of a treatment plant begun.[17]

In a densely populated area, individuals are not able to handle sewage efficiently. The *first basis for governmental action* is to provide public goods such as municipal sewage and waste treatment systems. However, the municipality has only limited constituency (and funds) and is not likely to consider the interests of downstream users. The *second basis for governmental action* then, is to establish rules and regulations at a level where a larger number of constituents (and funds) are represented. Rules and regulations established at the regional, state, or federal level are likely to be responsive to a larger number of interests than would occur at the municipal level.

These two bases of governmental responsibility are now discussed in greater detail.

The Provision of Public Goods

Although in a private enterprise system, most goods and services are provided through a price and market system, some goods, referred to as *public goods,* are provided by local, state, or federal government, and financed by taxes and other sources of public revenue. Examples of public goods include national defense, administration of justice, highways, public educational facilities, public parks and recreational facilities, and waste treatment facilities.

Public goods have several distinguishing characteristics. First, they are indivisible in the sense that they are available only in such large units that they cannot normally be purchased in whole units by individuals. Second, the benefits of public goods are incident upon the community as a whole and are not limited to those who contribute to the purchase of the goods. Third, the individual consump-

[17] The objective of this section is to illustrate the rationale for public action. For a more complete report of the Twin Cities sewage problem, see: Twin Cities Metropolitan Planning Commission, "Metropolitan Sewage Study," Metropolitan Planning Rpt. No. 7, Aug. 1960, and Barry Peterson, "The Sanitary Sewage Problem." The Joint Land Use-Transportation Planning Program, Physical Development Section, Metropolitan Council, Pap. No. 4, Dec. 30, 1966.

tion of such goods does not preclude consumption of these goods by others.[18]

The provision of waste treatment facilities is generally the responsibility of municipal or regional government. Although the wisdom of the collective provision of waste disposal facilities is apparent, considerable controversy may occur between municipalities in coordination and methods of financing and cost sharing.

In addition to the provision of waste treatment facilities, other public goods pertaining to water quality include research and development on waste treatment and monitoring techniques. Individuals generally do not have the resources to carry out these activities. Although private enterprise may play a significant role in development of equipment for waste treatment and water quality monitoring, the public sector provides the major market.

Up-to-date equipment aids in monitoring water quality at the Minneapolis Office of the Federal Water Pollution Control Administration.

The Fallacy of Limited Decisions

The second area in which government activity may be involved is establishing and enforcing rules and regulations regarding water quality control. As pointed out earlier, the provision of waste treatment facilities is normally at the municipal level. However, municipalities, in the absence of regulations imposed from a level of government having a broader constituency, have little or no incentive to consider the interests of downstream users. The proposition that downstream users should be protected, certainly a reasonable one, opens the way for governmental authority at the state or regional level.

Public authority at local, state, and federal levels is sometimes vigorously opposed. A possible explanation is *the fallacy of limited decisions*. This fallacy assumes that there is a limited number of decisions to be made by society. Therefore if an increased number of decisions are made by the public sector, fewer will *necessarily* be left to the private sector.

The proposition that a greater number of decisions made by the public sector implies less to be made by the private sector is not necessarily true. *Soundly conceived and competently executed public policy may substantially increase the options open to individuals and to private enterprise*. As an example, public policy may establish standards designed to maintain water quality and thus restrict the options available to waste dischargers. However, this may open up a vast array of options to individuals, such as fishing, boating, and other recreational opportunities previously not available. This may have secondary effects such as increased sales of equipment, receipts to the regional economy through tourism, and increasing property values. Thus, governmental establishment and enforcement of water quality standards cannot necessarily be opposed on the grounds of restricting individual freedom.[19]

Limitations of Governmental Responsibility

Although it is clear that government has a legitimate and important role in water quality control, it cannot be assumed that the problem will necessarily be solved by the public sector. An important limiting factor is that influence on legislative bodies responsible for passing laws does not *necessarily* occur in proportion to *numbers* of constituents. Small, well organized interest groups are frequently able to exert more legislative influence than larger, unorganized groups which have less access to the legislature.

Another fact which must realistically be considered is that the enactment of legislation does not necessarily mean that a problem is solved. For example, water quality standards, whether for stream standards or effluent standards, require monitoring and, possibly, legal action to ensure enforcement. In other words, to successfully carry out a water quality control program by the public sector, in addition to the original legislation, adequate appropriations must be made to provide for staffing, monitoring, and enforcement activities of the executive branch to make the program meet the objectives desired by the public which, broadly stated, might be to protect the right of the individual citizen to enjoy access to unpolluted water.

This means that the water quality controversy cannot be assumed by the public to be resolved simply because it is receiving governmental attention.

[18] Exceptions may occur, such as overcrowding of highways or other facilities. In contrast, *private goods* are those readily available through the market system in units small enough to be purchased by individuals. The consumption of private goods by an individual or small group generally precludes consumption of these goods by others. The benefits of private goods are limited primarily to the purchaser. The difficulty of pricing *public goods* in the market adds to the complexity of natural resource decisions. See: Lee R. Martin, *The Minnesota Agricultural Economist*, "Joint Products of Natural Resources," Sept. 1968.

[19] The interested reader may pursue this idea further in a popular basic economics text, Campbell R. McConnell, *Economics: Principles, Problems, and Policies*, Third Edition, Chapter 6, McGraw-Hill, New York, 1966.

FEDERAL RESPONSIBILITY

Federal Water Pollution Control Act

The basic federal legislation regarding water pollution is PL 84-660, popularly called the Federal Water Pollution Control Act, enacted in 1956. The basic act was amended in 1961 (PL 87-88), again by the Water Quality Act of 1965 (PL 89-234), and by the Clean Water Restoration Act of 1966 (PL 89-753).

The declaration of policy under the Act states that its purpose is

> "to enhance the quality and value of our water resources and to establish a national policy for the prevention, control, and abatement of water pollution." It declares policy to "recognize, preserve, and protect the primary responsibilities and rights of the states in preventing and controlling water pollution, to support and aid technical research relating to the prevention and control of water pollution, and to provide federal technical services and financial aid to State and interstate agencies and to municipalities in connection with the prevention and control of water pollution."

As originally enacted, the Surgeon General of the U.S. Public Health Service was authorized to make grants to any state, municipal, or interstate agency for the construction of necessary treatment works to prevent the discharge of untreated or inadequately treated sewage into interstate waters and their tributaries. The amendments of 1961 authorized the establishment and maintenance of research facilities and water quality studies. In addition, federal pollution abatement and enforcement authority was extended to all navigable water, if requested by a state or municipality (with concurrence of the Governor and State Water Pollution Control Agency) whether or not there was interstate pollution.

The Water Quality Act of 1965 authorized the Secretary of Health, Education, and Welfare to make grants to interstate, state, and local government agencies for research and development of improved methods of water quality management and increased the grant program for construction of sewage treatment works.

The Federal Water Pollution Control Administration, responsible for carrying out the federal water pollution control program, was created in 1965 within the Department of Health, Education, and Welfare and transferred to the Department of Interior in 1966.

A very significant provision of the Water Quality Act of 1965 is the requirement that states were to develop water quality criteria applicable to interstate waters within their state and develop a plan for implementation and enforcement of the criteria by June 1967. Progress on this aspect for Minnesota is summarized in a later section.

The Clean-Water Restoration Act of 1966 provided that the Secretary of Interior be authorized to make grants not to exceed 50 percent of the administrative expenses of a planning agency which is capable of developing an effective comprehensive water quality-control and abatement plan for a basin. In addition, the amounts which may be appropriated under the Act for water pollution control programs were increased.

In total, the Clean Water Restoration Act provides for financial assistance in three forms: for research and development of water quality control programs, for water pollution control programs, and for construction of sewage treatment works. The following table shows the annual federal appropriation for waste treatment facilities.

Table 2. Federal appropriations for waste treatment facilities

Fiscal year	Federal total authorization	Proposed allocation to Minnesota	Actual federal appropriation	Actual allocation to Minnesota
1966-67	$ 150,000,000	$ 2,743,250	$150,000,000	$2,743,250
1967-68	450,000,000	8,377,550	203,000,000	3,728,000
1968-69	700,000,000	13,072,100	214,000,000	3,931,000
1969-70	1,000,000,000	18,707,100	?	?
1970-71	1,250,000,000	23,402,350	?	?
	$3,550,000,000	$66,302,350		

Prior to July 1, 1967, grants under this program were generally limited to 30 percent of the eligible cost, or a maximum of $1.2 million per applicant on any one project. Under this legislation, the dollar limitation was removed. Also, provision was made for the federal share to be increased to 40 percent if the state agrees to pay not less than 30 percent for all projects funded. The federal share can also go up to 50 percent if the state agrees to pay at least 25 percent of all projects funded, and if enforceable water quality standards have been established for the waters into which the project discharges.

A bonus of an additional 10 percent of the federal grant can be awarded to any project that is part of a metropolitan area-wide plan, raising the possible federal contribution to 33, 44 or 55 percent.

The Clean Water Restoration Act also added the reimbursement provisions which said a community could actually proceed to construct sewage treatment works without a federal grant and then be reimbursed to the extent allowable, provided all appropriate state and federal requirements have been met from any such allotments the state receives prior to July 1, 1971.

The Minnesota Pollution Control Agency is responsible for processing applications for federal grants to local agencies for waste treatment facilities. Since the beginning of the grant program, requests each year have totaled approximately four times the funds available. In fiscal year 1968-69, Minnesota applications approximated $50 million in estimated construction costs with approximately $15 million requested in federal grants, while only $3.9 million of the latter was available.

Minnesota presently has no matching grant programs for local assistance for construction of waste treatment facilities.[20] The basic federal grant available is limited to 30 percent of the project cost, leaving 70 percent borne by local government. With a state matching grant of 25 percent and establishment of enforceable water quality stand-

[20] The 1969 session of the Minnesota Legislature failed to enact such a program. As of May 1969, at least 17 other states had enacted a state matching program.

ards, the federal grant could be 50 or 55 percent, leaving 20 or 25 percent of the cost of facilities to local government.

Thus far, Congress has not appropriated funds for the programs in the full amount authorized under the law. Because of competing demands for public expenditures at the Federal level, it is unlikely the maximum amount authorized for fiscal years 1970 and 1971 will be appropriated. Consequently, not all municipalities eligible for grants for waste treatment facilities will receive them.

Other Federal Responsibility

Grant programs besides the Federal Water Pollution Control Act include the following:

Consolidated Farmers Home Administration Act of 1961, as amended, is administered by the Farmers Home Administration (FHA), U.S. Department of Agriculture. Federal aid of up to 50 percent of the construction costs for sewage treatment works and sanitary sewers is available to Minnesota communities which have a population of less than 5,500 and are located in rural areas. Only 30 percent grants are offered to municipalities for sewage treatment construction in noneconomically distressed areas, to prevent being competitive with the program administered by the FWPCA. The Department of Commerce and Labor determines a distressed area for federal purposes. Loans are also available.

The Public Works and Economic Development Act is administered by the Economic Development Administration (EDA) of the Department of Commerce. Federal participation of 50 percent or more of the eligible construction costs of sewage treatment works and sanitary sewers is obtainable by communities located in areas designated by the Federal authorities as distressed. Loans are also available.

The Housing and Urban Development Act of 1965 is administered by the Department of Housing and Urban Development (HUD). The statute provides for up to 50 percent grants of the construction costs of sewer facilities which are not eligible for aid under the Federal Water Pollution Control Act. This financial assistance is available to municipalities over 5,500 population. Loans are also available. Any municipality may also apply for an advanced planning loan to retain a professional engineering firm to prepare a report on sewage facilities.

There are several other bases for federal activity in the area of water quality control.

In 1961, an amendment to the Water Quality Control Act provided

> "that in the survey or planning of any reservoir by the Corps of Engineers, Bureau of Reclamation, or other federal agency, consideration shall be given to inclusion of storage of stream flow for the purpose of water quality control."

This simply means that water quality control through dilution is an authorized function of dams constructed by the Corps of Engineers and other agencies.[21]

Other federal legislation includes the Oil Pollution Act of 1924 which prohibits the discharge of oil into coastal waters. The Water Quality Act of 1965 amended this act to prohibit discharge in inland navigable waters as well.

Executive Order 11288, issued July 2, 1966 prescribes procedures and standards governing the treatment of wastes resulting from activity of federal installations in the United States.

Public Law 88-379, the Water Resources Research Act of 1964, provides grants to universities and other institutions for research and educational activities in water resources. Substantial amounts of these funds have been allocated to projects directly related to water quality.

A significant step toward coordinated federal-state-local water resource planning and development was taken with the enactment of PL 89-80, the Water Resources Planning Act of 1965. Matters concerning water quality must be dealt with if planning activities are to serve the needs of the people of individual states and localities.[22]

STATE AND LOCAL RESPONSIBILITY

Minnesota Pollution Control Agency

At the state level, the primary responsibility for water pollution activities rests with the Minnesota Pollution Control Agency (MPCA), although some authority in matters relating to sources of domestic water supplies and public health remains the responsibility of the State Department of Health. The new agency replaces the Water Pollution Control Commission, established in 1945, and assumed all of the responsibilities in water pollution, in addition to new responsibilities in the field of air pollution, solid waste disposal, and land use as related to pollution. It meets monthly, has a full-time executive director and staff, and nine Governor-appointed part-time members.[23]

[21] However, by administrative agreement with the Federal Water Pollution Control Agency, costs cannot be charged to water quality control unless at least 85 percent treatment is being provided at the sources affected. The practical effect of this agreement is to prevent polluters from passing responsibility for treatment on to the Federal Government.

[22] For a summary of Minnesota activity under this Act, see: John J. Waelti, *Minnesota Agricultural Economist,* "Statewide Water Resource Planning in Minnesota," Sept. 1968.

[23] The present part-time members include: Robert Tuveson, chairman, an attorney; Homer Luick, vice chairman, former vice president, Northwestern National Bank and former president, Minnesota Conservation Federation; F. Wayne Packard, president, Culligan Water Conditioning Company; Mace Harris, former vice president, Northwest Paper Co.; Steve Gadler, professional engineer; John Borchert, Department of Geography, University of Minnesota; Dr. Harold Anderson, medical consultant, Mayo Clinic; Milton Fellows, a farmer; and Mrs. R. C. Nelson, a housewife. The part-time members serve staggered 4-year terms, all expiring on February 15, two in 1970; two in 1971; two in 1972; and three in 1973.

The MPCA has the following powers and duties relating to water pollution:

Administering and enforcing all laws relating to the pollution of any waters of the state;

Investigating extent, character, and effect of pollution of waters of the state;

Regulating, establishing, and ordering pollution standards and the issue or denial of permits for discharge of sewage, industrial wastes, and other wastes; and

Planning activities with the State Planning Agency in comprehensive river basin planning.

It is the policy of the MPCA to encourage local government to initiate solutions to local pollution problems with technical assistance available from the state. If problems cannot be resolved satisfactorily locally, the agency must itself evaluate the problem, determine a proper solution, and carry it through by whatever means are required and available.

A chemist at the Minneapolis Office of the Federal Water Pollution Control Administration analyzes water samples for dissolved oxygen.

In 1961, Minnesota law provided for the establishment of sanitary regions and for the creation and administration of a water pollution control advisory committee and sanitary districts. Each congressional district of the state constitutes a sanitary region. The advisory committee consists of two members, appointed by the Governor, from each region. The committee's purpose is to assist the MPCA in the performance of its duties and to maintain a liaison between the agency and communities, industries, and persons concerned with water resources.

Minnesota Progress on State Water Quality Standards

The Federal Water Quality Act of 1965, described here, made mandatory the adoption of water quality standards of interstate waters by July 1967. If the individual states did not comply with this order, the Federal Water Pollution Control Administration could set standards.

In 1963 Minnesota began working on a general framework of criteria for classification and establishment of water quality standards which was well along by the time the Federal Water Quality Act of 1965 was passed.

Proposed criteria for classification for all interstate waters (about 4,000 miles) and establishment of standards were prepared and submitted for review and criticism at five public hearings from January through March 1966 at different locations throughout the state. These criteria were adopted in March 1967. In April 1967, five similar public hearings received and considered testimony and evidence bearing on the appropriate classifications for 4,000 miles of interstate waters and establishment of standards of water quality and purity. In addition, a plan of implementation and enforcement of these standards was presented in conformance with requirements of the Federal Water Pollution Control Act. The state subsequently adopted the classification, standards, and enforcement plan, and was able to meet the June 30, 1967 deadline set by Congress for interstate standards to the FWPCA.[24] Minnesota interstate standards were approved by the Secretary of Interior on June 18, 1968 with certain exceptions most of which have been resolved.

In addition to interstate water quality standards, water quality criteria and effluent standards for intrastate waters have also been established.

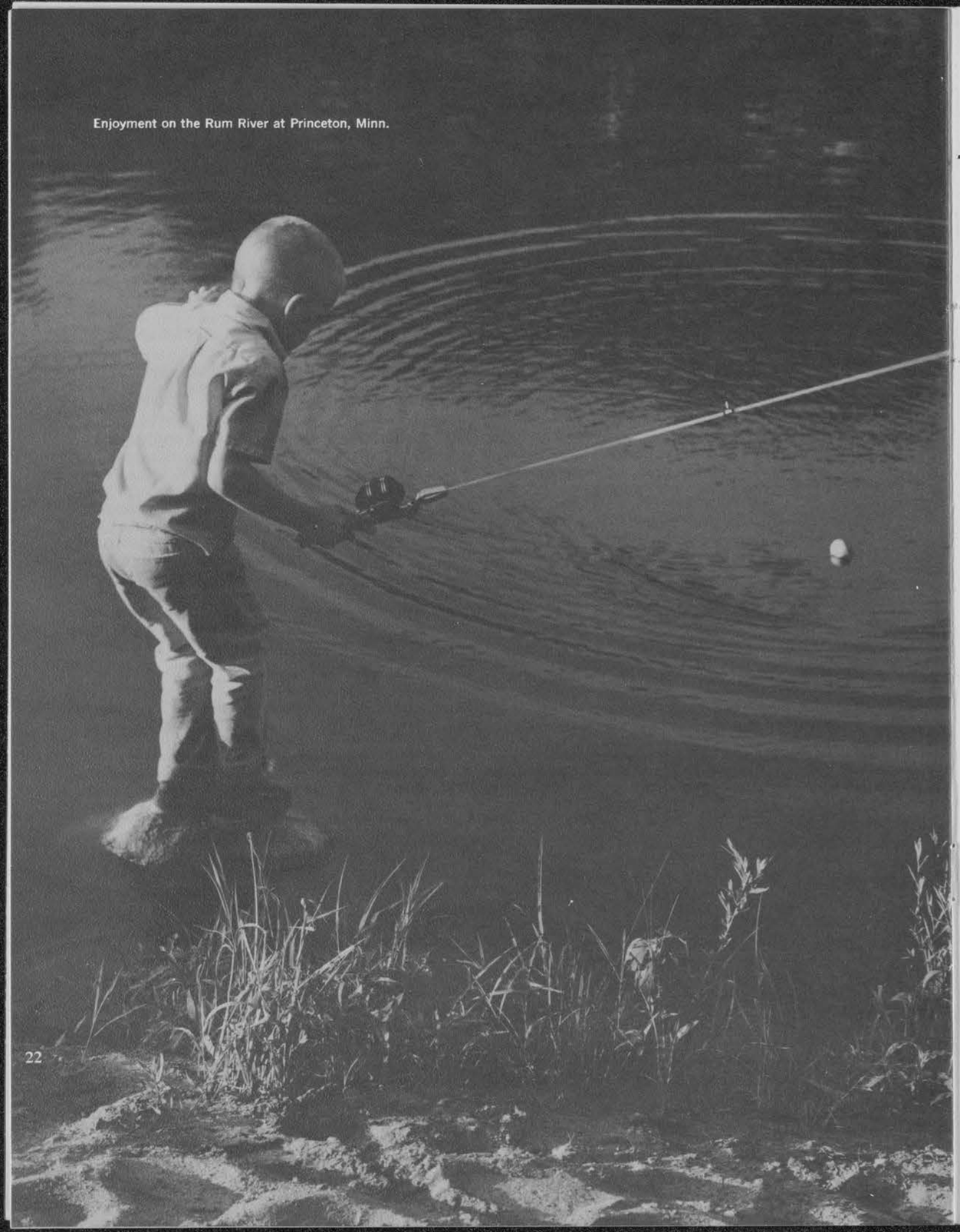
Key Role of Local Responsibility

Because so many decisions regarding waste treatment are made at the local level, local responsibility must play a key role in any pollution control program. Communities' realization of the negative impact of pollution on the local economy (especially in resort areas) and on the quality of the environment can provide additional incentive for the provision of necessary funds for waste treatment and pollution control at the local level.

County enforcement will be the key to the success of the new Minnesota Shoreland Zoning Ordinance (see footnote 27). Although the state will set minimum standards to control pollution of lakes, the county governments have the option of adopting more restrictive standards to meet their local requirements. Strict enforcement on the part of the counties will be needed if this new zoning ordinance is to be of help in controlling the pollution of state lakes.

In addition to responsibility for treatment of municipal and industrial wastes, other community activities are extremely important. Locally administered agencies such as the County Soil and Water Conservation Districts in Minnesota have knowledge of local conditions and access to technical skills (through cooperation of agencies such as the Soil Conservation Service) that are necessary to implement responsible land management practices which reduce pollution from excessive land runoff.

[24] A report on interstate water quality standards is to be made available to the public by the MPCA.



Enjoyment on the Rum River at Princeton, Minn.

"It is better to debate a question without settling it, than to settle it without debate." — Joseph Joubert

An Interpretation of the Controversy

Agreement on Principle — Controversy on Specifics

The technology for preventing most forms of water pollution is known. Everyone favors clean water. No one has ever signed a petition favoring pollution. Why, then, do serious water pollution problems exist?

There are several factors which explain but do not necessarily rationalize the existing situation. Part of the explanation may be that waste treatment works are public goods as explained earlier. It would seem that this should not be a reason for underinvestment. However, the argument has been advanced that because of the clear-cut exchange of benefits for specific voluntary payments realized with the purchase of private goods, and because of the compulsory element of taxation through which public goods are financed, there is a bias in favor of private goods at the expense of public goods. Hence, there is the irony of using modern, well-designed camping gear to camp alongside a polluted stream.

The validity of the public vs. private goods argument itself has been the subject of some controversy. However, there are several other relevant factors. Industry has traditionally located where there was an abundance of water and need for treatment was not at first evident. It is sometimes argued that industry is unable to bear the cost of treating its waste water, and to require this would force industry to seek other locations. It is sometimes argued, too, that high water quality standards might nullify the advantage of water-rich areas for attracting industry.

Again, these questions are subject to some controversy. It might be argued that with uniform water quality standards across the nation, heavy water-using industries would have no advantage in shifting locations, on this basis. The role of a high quality environment and recreational opportunities in attracting employees might at least partially compensate for higher costs involved in waste treatment. Even if the requirement of more thorough waste treatment raised costs to industry, and these costs were passed along to consumers as higher prices, it is conceivable that the public would willingly pay the higher prices in return for cleaner water.

Still another possible explanation for pollution problems is the *fallacy of limited decisions* — the belief that more decisions made by the public sector will necessarily limit those options available to the private sector. As pointed out earlier, key public decisions sometimes increase the options open to the private sector.

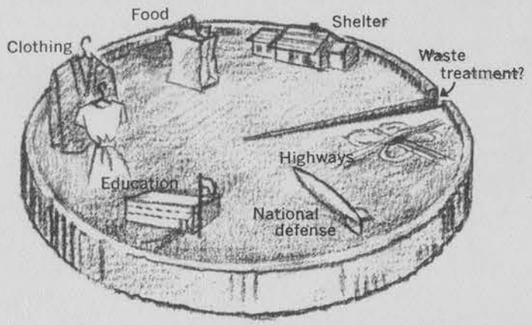
These issues are all part of the controversy. However, the real issue remains for discussion.

The Heart of the Controversy

The heart of the water quality controversy rests on the proposition that if conditions are to be improved, somebody must pay. Even in an affluent society, there are not enough resources to produce unlimited amounts of private goods such as food, clothing, shelter, automobiles, appliances, and public goods, such as national defense, schools, or highways. Although recent national economic policy has been significant in ensuring full employment of resources, the increased production of waste treatment facilities means that something else must be cut back. If wastewater is not treated, costs are in terms of lost recreational opportunities, increased costs incurred by downstream users, lost revenue from tourism, lowered property values, and a general deterioration in the quality of our environment. If wastewater is treated, and other measures are taken to maintain water quality, costs are either incurred in the form of higher taxes to individuals and business, or higher costs to industry (which may or may not be passed on to consumers, depending on the ability of the industry to do so).

With greater public responsibility in water quality control, resources are required not only for treatment of wastes *per se,* but for increased research, staffing, and equipment necessary to monitor and enforce standards and to develop more efficient ways of handling wastes.

Those who are involved in the water quality controversy face the immutable economic axiom that the increased use of fully employed resources for one purpose necessitates a reduced use for others.



Waste treatment must compete with many other uses of limited resources.

Organizing the Policy Issues

Although the matter of economics lies at the heart of the problem, there are many issues involved in the water quality controversy. To create some order for a rational discussion, three sets of problems may be outlined.[25]

The first set of problems revolves around methods of attaining various levels of water quality. This is an engineering, an economic, and an administrative problem. There are usually several alternative methods of maintaining water quality such as dilution, conventional treatment, and mechanical aeration. The design of waste treatment systems that are technically feasible as well as the development of new technology is a problem involving chemistry, microbiology, and engineering. Although there may be a number of technically feasible methods of maintaining water quality, the practical choice of systems is limited by costs. There will probably be economically superior designs with respect to location and capacity of treatment plants and other pollution control facilities along a given stream. Controversy may center on how the costs are to be shared or on the capacity of a system to maintain water quality at the desired level. Additional research is needed on technical problems such as eutrophication and disposal of agricultural wastes.

A second set of problems revolves around the question of level of water quality that should be attained. There may be agreement on the technically and economically feasible methods of maintaining water quality at alternative levels. However, there still may be considerable controversy regarding the proper level of water quality. For example, one faction may argue that it is best to make maximum use of the self-purification potential of a stream, minimizing the needed treatment facilities. Another faction may argue that wastes should be treated thoroughly to permit maximum recreational use of a stream. Others would argue that a logical solution is somewhere between these alternatives. A difficult problem to resolve involves the level of water quality to be maintained on reaches of streams in heavy industrial areas which are also near large, low income population centers.

This second set of problems is both economic and political. Thus far, this aspect of the controversy has been resolved through the political process as the benefits of water pollution control, mainly recreational and aesthetic values, are non-market in nature and difficult to measure by economic criteria. Even if these values are estimated by economists, it is society, rather than economists, which, properly, makes the ultimate decisions regarding allocation of resources.

The third set of problems involves institutional means by which water quality control policy can be implemented. These problems have economic, political, sociological, and legal implications. Even if there is general agreement on the proper level and means of maintaining water quality, the most idealistic plans for water quality control are of no value if they cannot be implemented and enforced.

Among the possible means for implementing water quality control policy are tax credits for industry which builds treatment facilities, laws requiring waste dischargers to treat wastes, and effluent charges by which a waste discharger, whether industrial or municipal, would pay a fee to a regional or state authority in relation to amount of waste discharged. These charges could be used to finance regional pollution control facilities. Each of these policy measures has its advantages and disadvantages and is subject to considerable controversy. In metropolitan areas such as the Twin Cities, the matters of financing, construction, and operation of sewage collection facilities is made more complex by controversy among numerous governmental units.

At the state and federal level, as well as the local level, the development of institutional means by which quality problems can be solved is important. *The ability of these institutions to successfully formulate and implement water quality control policy which is responsive to the needs and will of the public is at least as important as the development of more efficient and economical technology in changing controversy into constructive action for the improvement of water quality.*

Issues Facing the People of Minnesota

The ultimate objective of any water quality control policy must be to serve people. There are many explicit problems on which policies must be formulated while options are still available.

A problem which urgently requires attention is lakefront zoning in Minnesota. With over 80,000 lakefront homes in the state and the number growing rapidly each year, the remaining undeveloped lakeshore is rapidly disappearing.[26] The manner in which lakefront is utilized will have important implications on lake water quality.[27] Once a haphazard pattern of development is begun and eutrophication accelerates, the process is, under present technology, impossible to reverse. Although even the most farsighted and comprehensive zoning program will not ensure preservation of water quality, the alternative is to permit events to develop without public policy guidelines.

The problem of stream water quality standards has already received some attention. The public will probably not make available sufficient resources to purify all waste water in the state enough to permit swimming and waterskiing. However, many would opt for cleaner streams than presently exist. Minnesotans must decide on a balance between stream standards desired and the resources required to achieve these standards. Especially, will public revenue be shifted from the state level to the local level to assist municipalities in waste treatment? The stream standards already set under auspices of the Federal Water Pollution Control Act represent a beginning. These standards will be subject to continual public review and revision.

Another problem yet to be resolved is the coordination of waste treatment facilities in the Twin Cities Metropolitan Area. Issues included the level of government needed and area of responsibility, functions of an agency responsible for regional sewage disposal, and payment formulae. The ultimate solution will depend partially on whether the Mississippi River is to be used for sewage dilution where convenient or whether only limited stretches, if any, are used for this purpose and the remaining sections kept of sufficient quality to permit fishing and other recreational activities.

The formation of more comprehensive water quality policies will require effective administration. The willingness of the people of Minnesota, as expressed through the legislature, to formulate a program and provide the funds for the necessary technical and legal staff will in large measure contribute to the state's success or failure in attaining the water quality objectives the public desires.

The state's problems in water quality control are greatly simplified because of its "top of the hill" location. Minnesota is the origin of waters — its major streams flow into other states. In other words, Minnesota's waters are polluted in Minnesota.

As with most controversial subjects, there are no simple or clear-cut, all encompassing solutions — only imperfect measures with which to try to solve complex problems. Alternative courses of action are still available but are becoming more limited each year. The people of Minnesota must decide.

[25] This outline is based on that proposed by Allen V. Kneese, *The Economics of Regional Water Quality Management,* Johns Hopkins Press, Baltimore, 1964.

[26] A study on Minnesota Lakeshore Development is currently in progress in the Department of Geography under the direction of John R. Borchert, and another on Seasonal Home Ownership in Rural Areas in the Department of Agricultural Economics under the direction of Robert W. Snyder, both at the University of Minnesota.

[27] A law was amended by the 1969 Minnesota Legislature to require the Conservation Department to formulate by July 1, 1970, model standards and criteria for development of shoreland. Individual counties are to adopt shoreland conservation ordinances by July 1, 1972, or accept the model ordinance of the Conservation Department. (Amendment to Minnesota Statutes 1967, Chapters 105 and 396 by adding sections 394.25, Subdivision 2; and 396.03.)

Technical Terms Commonly Used in the Water Quality Controversy

Aerobic decomposition — A process of decomposition in which bacteria utilize oxygen in the breakdown of organic matter.

Algicide — Any material, substance, or compound which is fatal to algae or inhibits enough growth to be considered a potential means of control.

Algae — A broad class of microscopic plants which inhabit water. Although some forms of algae are necessary and desirable, excessive concentrations tend to discolor water and cause objectionable tastes and odors, severely limiting water's recreational uses.

Anaerobic decomposition — A process of decomposition in which breakdown of organic matter occurs by bacteria without the use of oxygen, resulting in production of hydrogen sulfide and other obnoxious gases.

Bacteria — A broad class of miscroscopic one-celled organisms. Bacteria provide a useful function in the decomposition of organic matter. The self-purification potential of streams depends on bacterial action.

Biochemical oxygen demand — (BOD). A measure of waste load represented by the amount of dissolved oxygen utilized in the aerobic decomposition of organic matter in water (usually over a 5-day period). The higher the expressed BOD, the greater is the waste load.

Coliform bacteria — Bacteria present in large numbers in humans and hence, in sewage. Because coliform bacteria are always present in relatively large numbers in sewage, because they may be detected with comparative ease, and because purification procedures which cause their elimination or destruction are equally effective against pathogens, the routine bacteriological analysis of water is concerned mainly with testing for the coliform group of bacteria.

Colloidal materials — Particles suspended in liquid which are intermediate between true solutions and suspensions.

Degradable wastes — Substances which are changed in form and/or reduced in quantity by the biological, chemical, and physical phenomena characteristic of natural waters. *Biodegradable* is a term specifically referring to decomposition by biological processes.

Dissolved oxygen — Refers to oxygen which is dissolved in water. Dissolved oxygen is essential for fish and other aquatic life and for aerobic decomposition of organic matter.

Effluent — An outflow of water such as from a septic tank or a waste treatment plant.

Enrichment — An increase in nutrients, mainly nitrates and phosphates, which fosters growth of algae and other plant life in water.

Eutrophic — Waters rich in nutrients.

Eutrophication — The process of aging of a lake; occurs slowly under natural conditions, but may be greatly accelerated by man's actions (sometimes referred to as *cultural eutrophication*).

Fallacy of limited decisions — The proposition that there are a limited or fixed number of decisions to be made by society and that if more decisions are made by the public sector, less are necessarily available to the private sector. This proposition is often not true as there are many examples where public policy has increased the options available to the private sector.

Hardness of water — A condition in which water contains high concentrations of mineral salts which interfere with lathering and cleansing properties of soap and cause incrustation of pipes and other plumbing fixtures.

Inorganic matter — Compounds that do not contain carbon and hydrogen.

Intangible costs and benefits — Costs and benefits which are not established through the price and market system. "Non-market" is sometimes preferred to the term "intangible." The loss of game fish through pollution is an example of an *intangible cost*. Boating and other recreational activities are examples of *intangible benefits* associated with water resources.

Limnology — The study of freshwater lakes and streams.

Nondegradable wastes — Substances that are not changed in form and/or reduced in quantity by the biological, chemical, and physical phenomena characteristic of natural waters. Although nondegradable wastes may be diluted by receiving water, they are not reduced in quantity.

Organic matter — Compounds which contain both carbon and hydrogen. Organic substances are the chief constituents of living things although many organic compounds can be synthesized.

Oxygen deficit — The difference between observed oxygen concentrations and the amount that would be present at 100 percent saturation.

pH — A technical measure of acidity or alkalinity. A pH of 7 is neutral, over 7 is alkaline, and under 7 is acidic.

Pollution — Waste materials in a watercourse which adversely affect water for any particular use, including aesthetic.

Primary treatment — Treatment of sewage to the extent that the heavier solids and flotable materials are settled out.

Private goods — Goods purchased by individuals through the price and market system which yield benefits primarily to the purchaser.

Productivity — In the context of water quality, this refers to the capacity of a body of water to produce algae and other aquatic life. Productivity increases as eutrophication proceeds although certain species, such as game fish, decline.

Public goods — Goods which are not readily available through the price and market system and which yield widespread benefits to society. Public goods are normally financed by taxes and other sources of public revenue and benefits are not limited to those who finance these goods. Waste treatment facilitates and sewer systems are examples of public goods.

Reaeration — The absorption of oxygen in water from the atmosphere. This phenomenon enables self-purification of streams by providing the necessary oxygen to bacteria.

Secondary treatment — Treatment of wastes beyond the primary stage, utilizing biological processes, to the extent that a portion of the remaining organic matter is decomposed before discharge of the effluent.

Self-purification — The process by which a stream is purified some time after receiving a waste discharge. This occurs in the decomposition of organic matter by oxygen-using bacteria.

Septic conditions — A term sometimes used to refer to conditions where dissolved oxygen is absent and decomposition is occurring anaerobically.

Social costs — Costs which are incurred by an individual or group but imposed on society as a whole.

Tertiary treatment — Treatment of sewage beyond the secondary stage to accomplish a very high degree of nutrient and/or BOD reduction.

Thermal pollution — The addition of heat to a lake or stream. An increase in water temperature fosters algal growth, reduces oxygen-holding capacity, and increases the rate of utilization of dissolved oxygen.

Turbidity — Cloudiness of water caused by presence of collodial matter or finely divided suspended matter.

References

Ciriacy-Wantrup, S.V. Dec. 1961. "Water Quality, A Problem for the Economist," *Journal of Farm Economics.*

Klein, Louis. 197. "Aspects of River Pollution." Academic Press, Inc., New York.

Kneese, Allen V. 1964. "The Economics of Regional Water Quality Management." Johns Hopkins Press, Baltimore.

League of Women Voters of the United States. April 1966. "Who Pays for a Clean Stream?" Pub. 313. Washington, D.C.

Minnesota Conservation Department. May 1968. *Key to the Common Aquatic Plants of Minnesota.* Division of Game and Fish, Special Pub. No. 53.

Minnesota Conservation Department. November 1968. *Control of the Common Aquatic Plants of Minnesota.* Division of Game and Fish, Special Pub. No. 39.

Minnesota Pollution Control Agency. June 1968. *Water Quality Sampling Program for Inter and Intra State Waters,* by L. E. Richie.

Minnesota Pollution Control Agency. 1969. *Water Pollution Education* by Bob Ray and Willard Sexauer.

O'Brien, R. D. 1967. *Insecticides, Action and Metabolism.* Academic Press, New York.

Peterson, Barry. Dec. 30, 1966. "The Sanitary Sewage Problem," The Joint Land-Use Transportation Planning Program, Physical Development Section, Metropolitan Council, Pap. No. 4.

Ruttner, F. 1963. *Fundamentals of Limnology.* University of Toronto Press, 295 p.

Snyder, Robert W. March 1968. *Planning for Pollution Control,* Staff Pap. P69-7, Department of Agricultural Economics, University of Minnesota.

Truman, David B. 1965. "The Governmental Process: Political Interests and Public Opinion." Alfred Knopf, New York.

Twin Cities Metropolitan Planning Commission. Aug. 1960. Metropolitan Sewage Study Metropolitan Planning Rpt. No. 7.

U.S. Department of Interior. March 1968. *Water and Water Pollution Control, A Selected List of Publications,* Washington, D.C.

U.S. Federal Water Pollution Control Administration. July 1966. "A Report on Pollution of the Upper Mississippi River and Major Tributaries."

U.S. Federal Water Pollution Control Administration. 1967. "Pollution Caused Fish Kills." Eighth Ann. Rpt.

Wu, Carson Kung-Hsien. 1968. "An Economic Investigation of the Problem of Water Quality Management in the Twin Cities-Upper Mississippi River Area." Unpub. Ph.D. dissertation, Department of Agricultural Economics, University of Minnesota.

Understanding the Water Quality Controversy in Minnesota
Extension Bulletin 359—1970

TENTATIVE AGENDA
STATE OF MINNESOTA
POLLUTION CONTROL AGENCY

BOARD ROOM - OFFICE BUILDING
717 Delaware Street S.E.
Minneapolis, Minnesota
December 8, 1969

GENERAL

9:00 I. Roll Call

II. Minutes of Meeting of November 10, 1969

III. Review of Agenda

AIR QUALITY

IV. Progress Report

V. Permits

VI. Variance Requests

SOLID WASTES

VII. Progress Report

VIII. Summary of Testimony on Solid Wastes

IX. Proposed Retired and Junked Automobile Management Plan Grant Application

X. Memorandum on Suggested Procedures Regarding Availability of Collection System and Open Burning, etc.

WATER QUALITY

XI. Permits

A. Sewage or Waste Treatment Works

B. Sewer Extensions

10:00 XII. Public Hearing on the Matter of the Violation by the Village of Cosmos of Regulation WPC 23.

11:30 XIII. Duluth - Requested by Agency to Appear

12:30 - 2:00 LUNCHEON

GENERAL

2:00 XIV. Minnetrista Sand and Gravel Company

WATER QUALITY (Continued)

XV. Legal Actions - Status

A. NSP Monticello Plant

B. Minneapolis re: NSSSD Plant

C. Sierra Club and MCEI re: Reserve Mining Company Permit

D. Filing of Rules of Procedure MPCA 1, 2 and 3

XVI. NSP Prairie Island Plant

XVII. Information Items

A. Status of Interstate Water Quality Standards

B. Winona - Goodview Situation

C. Memorandum on Review of NSP Environmental Monitoring Program for the A. S. King Plant made by Eville Gorham

D. Memorandum on Metro Development Guide - Sanitary Sewers

XVIII. Additional Items

A. Crystal Waters Program

B.

C.

D.

E.

XIX. Next Regular Meeting

A. Date: January 12, 1970

B. Time: 9:00 a.m.

C. Location: Board Room

XX. Adjourn

League of Women Voters of Minnesota 555 Wabasha St., St. Paul, Minn. 55102

Statement by Mrs. W. Brascugli, Water Resource Chairman
League of Women Voters of Minnesota
December 29, 1969
Public Hearing of the Metropolitan Council on the Metropolitan Sewerage Plan

The League of Women Voters of Minnesota wishes to publically commend the Metropolitan Council staff and the Sewer Board for the vision with which the policies for the Sanitary Sewer System have been established.

We especially commend you for policies 10 - 12, restricting on-lot private sewer systems, policy 1, prohibiting discharge of sewage effluent to all lakes in the area, and 25 - 27, concerned with maintaining the esthetic quality of the environment and natural resource preservation.

One of our main concerns will be in how these policies will be assured of being carried out during actual implementation of the plan. We assume that the same far-sighted thinking which went into the plan will also be used in the decision making during construction.

We do have one question concerning the policy on sewage disposal - on page 5, "Present technology for sewage disposal requires discharging treated effluent into bodies of water so that their natural capacity can be utilized to assimilate the treated effluent.", and, "Major rivers are the best receivers for treated sewage effluent.". and on page 15, "The Mississippi River above Minneapolis must be preserved as a prime source of drinking water for the Metropolitan Area. Therefore, the quantities of even highly treated sewage and industrial wastes discharged to the river upstream of the intakes to the water treatment plants must be minimal. On page 19 there is a discussion of the possibility and desirability of the use of Spring Lake and the Hastings Pool for body contact recreational use although their location is directly "down-stream" from the largest sewage treatment facility for the Metro area. We believe this multiple use is highly desirable, but wonder how it could possibly be achieved under the plan as stated unless tertiary treatment is recommended.

We would challenge this assumption that there is no alternative to the disposal of sewage than the "downstream concept", and refer you to the studies of Dr. John Shaeffer and the Northeastern Illinois Metropolitan Area Planning Commission, and technical report #4 - on page 157.

"The present "downstream" strategy needs to be expanded, where feasible, in to a more flexible strategy that includes closed-system or recycling concepts based on reclamation and reuse of water at local and metropolitan levels. Under this improved strategy, the solution to drainage and pollution problems becomes something more than disposal. Storm water runoff is detained in all types of surface and subsurface reservoirs for later beneficial use including water supply, recreation, and transport of used water. In such a strategy storm water is viewed as a "resource out of place"--valuable if properly used. Even pollutants in water are looked upon for possible reclamation." Refer to Chapter 4, page 110-120 Pollution source control, a discussion of various methods of reducing pollution at the source,including algae ponds,

holding ponds and reserviors, deep wells for disposal of highly concentrated wastes, spraying of sewage used for fertilizer and over wet lands, irrigation of golf courses, and experiments to reduce sewage treatment plant sludge to an inert ash whose volume is approximately 15% of the unburned sludge, which could then be disposed of into sanitary landfills. Another program would allow the use of effluent by industries as an auxiliary water source, all along the collecting sewer route. Another industrial transfer technique involves the water used in wet scrubbers for air pollution abatement in central refuse incinerators. The use of sewage effluent or even raw sewage for this purpose would not only reduce the use from drinking water sources, but since virtually all the effluent or even raw sewage used in the wet scrubbers would be consumed, this would also reduce the quantity of water-borne wastes discharged into surface streams.

I would like to refer you also to a film available at the Minnesota State Health Department, "The Living Filter" reviewing work done at Pennsylvania State University on the use of sewage for fertilization and irrigation.

Perhaps many of these alternate solutions have been evaluated and disallowed--if so, we do not see evidence of it in the report.

The by passing of low flows containing large quantities of sewage effluent around recreational lagoons to improve their water quality and enhance their recreational potential is another possible approach to the Spring Lake situation.

Page 111 - "If feasible processes can be developed for removing and concentrating other potential pollutants, a major step in reducing pollution at the source will have been taken." Much depends, of course, on the development of treatment processes which are within the financial means of local governments and industries. Page 114 - "In some cases, many of the water quality problems reflect a lack of adequate funding and staffing of public agencies charged with maintaining water quality, or else a lack of public perception of the problems and possible solutions. Often, however, the principal deterrents to effective water-quality management efforts are legal or governmental rather than technical."

We certainly hope that the Metropolitan Council will look to the future, and evaluate in the long-range objectives, all of the alternatives to the "downstream" concept of water quality management.