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A Profile of Public Officials, Government Structure, and Environmental Issues In The Lower Sheyenne River Basin, North Dakota

by

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FOREWORD

The quality of our environment is partially dependent on the decisions of our public officials. This report contains a review of the legal duties of selected local, state, and federal government units and agencies. Characteristics and attitudes of public officials are also discussed in the context of environmental issues.

We extend our appreciation to the following persons for their comments and information:

Donald Scott, Assistant Professor, Agricultural Economics,
North Dakota State University

George Pfeiffer, Research Associate, Agricultural Economics,
North Dakota State University

Thomas Ostenson, Associate Professor, Agricultural Economics,
North Dakota State University

Larry Falk, Professor and Chairman, Sociology, Concordia College

The research for this report was part of a project on land use and water quality in the Lower Sheyenne River Basin. The research is being conducted by a multidisciplinary team composed of William C. Nelson, Agricultural Economics; William T. Barker, Botany; Mary C. Bromel, Bacteriology; John A. Brophy, Geology; Delmer L. Helgeson, Agricultural Economics; and William D. MacKeller, Chemistry. The research was supported with funds from:

North Dakota Agricultural Experiment Station

North Dakota Water Resources Research Institute

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Highlights

There are a multitude of government units and agencies at the local, state, and federal levels concerned with environmental issues in the Lower Sheyenne River Basin (LSRB). The basin includes parts or all of 67 townships; 8 cities; 5 counties; 2 regional councils; and numerous special districts, boards, and commissions. Review of the legal responsibilities of these entities plus that of state and federal agencies revealed much overlap with respect to the requirement to have knowledge of water quality and to consider the impact of their actions on water quality. The North Dakota Department of Health and the United States Environmental Protection Agency hold the major responsibility for enforcing water quality regulations.

The majority of public officials who responded to a mail questionnaire were moderately conservative in political ideology, belonged to three or more voluntary associations, felt their primary clientele was the general public, most respected the opinions of farmers, and least respected the opinions of politicians. A greater percentage of state and federal officials felt there were serious environmental problems in the LSRB than did local officials as did a higher percentage of appointed officials than elected officials.

Water quality and soil erosion were identified as the most serious problems by respondents. Long-range comprehensive planning was favored by respondents as the means to solve environmental problems. Less than one-third of the respondents to a second survey of 33 government agencies and units indicated current activities or programs related to use or quality of water in the Sheyenne River.

A PROFILE OF PUBLIC OFFICIALS, GOVERNMENT STRUCTURE,
AND ENVIRONMENTAL ISSUES IN THE LOWER SHEYENNE RIVER BASIN,
NORTH DAKOTA

by

Jay A. Leitch, William C. Nelson, and David M. Saxowsky*

Environmental issues have become the focus of much attention in recent years. One environmental characteristic, water quality, is a major issue at both local and national levels. A series of community conferences held in North Dakota during 1972 identified the top priority problems for the state (North Dakota Water Resources Research Institute):

1. Identification of sources of water pollutants, including human, industrial, agricultural, wildlife, and others, and the determination of corrective measures.
2. Maintenance and enhancement of water quality of sufficient quantity for municipal and rural domestic, livestock, industrial, recreation, and other uses.

Public pressure for improved water quality throughout the United States resulted in the 1972 amendments to the Federal Water Pollution Control Act. The amendments require each state to prepare area-wide plans which include "a process to (1) identify, if appropriate, agriculturally related nonpoint sources of pollution, including runoff from manure disposal areas and from land used for livestock and crop production; and (2) set forth procedures and methods (including land use requirements) to control to the extent feasible such sources" (Federal Water Pollution Control Act).

Recent studies in North Dakota support the concern about water quality. Surveys of residents in the Lower Sheyenne River Basin (LSRB) in 1973 and in 1975 revealed that the majority of respondents were concerned about water quality (Falk, et al.; Falk). Residents in North Dakota State Planning Region VI were surveyed in 1976 concerning land use problems. Pollution of streams from farm chemicals, runoffs, and bank erosion was one of the four problems which was considered important.

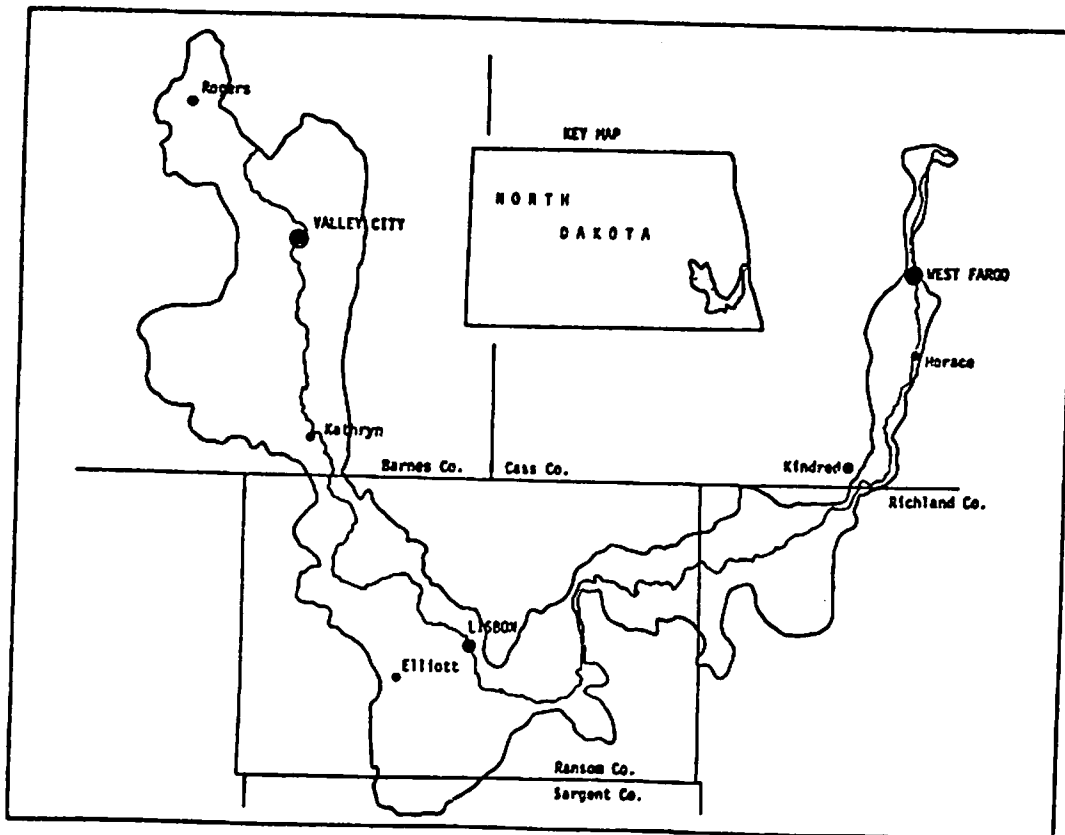
Water quality and environmental decisions are nearly always a responsibility of government units and/or agencies. This is due to

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the "public" nature of the surface water resource. Good water in a river is good water for everyone with access to it, not limited to a few individuals. Similarly, a polluted river affects all users of the river, not only those contributing pollutants. Joint action by citizens via a government unit is frequently necessary to maintain a quality environment.

The major purpose of this report is to identify general characteristics and attitudes of public officials in these units and agencies and obtain their opinions about selected environmental issues, including water quality in the Sheyenne River. A second purpose of this report is to identify the government units and agencies which have responsibility for the water quality in the Sheyenne River and review the legal basis for their authority.

The Lower Sheyenne River Basin (LSRB) was chosen on the basis of its water quality problems and events which are or may have a significant impact on the river (Figure 1). The Lower Sheyenne River (Bald Hill Dam to its confluence with the Red River) was identified as one of the principal areas of water pollution in the United States (Water Information Center). A diversion



1 inch = 18 miles

Figure 1. Lower Sheyenne River Basin (LSRB)

project to bring water from the Sheyenne River to the Red River to augment the Fargo, North Dakota, water supply was operated for the first time in 1976. The Garrison Diversion project may involve the Sheyenne River as a recipient of irrigation return flows. The Kindred Lake project to prevent flooding along the Lower Sheyenne River is being studied by the U.S. Corps of Engineers.

A. Structure of Governments

Local Governments

There are three major types of local governments in North Dakota: (1) townships, (2) municipalities, and (3) counties.

Townships

Townships are legal subdivisions of state government and, therefore, must operate within the legislation set forth by state government. A township's governing body consists of three supervisors elected for two-year terms. By law they must meet in March each year, but can also meet at other times. Township boards in North Dakota are not very active as governmental bodies (Omdahl, et al.). Their major responsibility in the area of the environment is in construction and maintenance of township roads. Decisions, such as whether to go around a marsh with a new road or when to mow the road ditches in the spring, have impacts on components of the environment. Some townships recently have developed zoning ordinances. This is the exception today in the Lower Sheyenne River Basin (LSRB), but may show an increase in the future. There are 61 townships in the LSRB (Table 1).

Municipalities

There are eight incorporated cities in the LSRB (Table 2). Two--Valley City and West Fargo--have the city commission form of government. The other six cities have the mayor/council form. Cities, like townships, have elected governing bodies and have the power to adopt ordinances. They must, however, operate within the legislation set forth by the state government. Cities in North Dakota are allowed to incorporate under an acceptable plan and the powers of the governing body for the municipalities are outlined in Chapter 40-05 of the North Dakota Century Code (NDCC).

TABLE 1. TOWNSHIPS IN THE LOWER SHEYENNE RIVER BASIN

County	Township
Barnes County	Thordenskjols, Oak Hill, Spring Creek, Rosebud, Norma, Nelson, Skandia, Svea, Cuba, Marsh, Green, Hemen, Alta, Valley City,* Hobart, Noltmier, Getchell, Stewart, Anderson, Grand Prairie, Ashtabula, Rogers, Edna, Dazey
Cass County	Harwood, Reed, Barnes, Mapleton, Stanley, Warren, Pleasant, Normanna
Ransom County	Coburn, Greene, Moore, Preston, Northland, Owego, Shenford, Casey, Tuller, Springer, Fort Ransom, Sandown, Scoville, Big Bend, Island Park, Elliott, Sydna, Aliceton, Bale, Alleghany
Richland County	Walcott, Barrie, Helendale, Viking, Sheyenne, Garborg, Freeman
Sargent County	White Stone Hill, Vivian

*Valley City Township is the fourth commissioner district in the city of Valley City.

TABLE 2. MUNICIPALITIES IN THE LOWER SHEYENNE RIVER BASIN

City	Population	Form of Government
Valley City	7,843	Commission
West Fargo	6,437	Commission
Lisbon	2,090	Mayor/Council
Kindred	495	Mayor/Council
Horace	400	Mayor/Council
Kathryn	110	Mayor/Council
Rogers	96	Mayor/Council
Elliott	50	Mayor/Council

SOURCE: Interviews with city officials, July, 1974.

NDCC, 40-05-01 subsection 59, reads (as amended):

"Public works project. To accept aid from, cooperate and contract with, and to comply with and meet the requirements of any federal or state agency for the establishment, construction and maintenance of public works, including dams and reservoirs for municipal water supply, for water conservation, for flood control, for the prevention of stream pollution, or for sewage disposal . . ."

Clause 61, same section:

"Public water supply. To prevent the pollution of or injury to any water supply belonging to the municipality or any public water supply within, or within one mile of, the limits of the municipality."

Cities are responsible for preventing pollution of their water supply and to cooperate with superior governments which aid in water supply projects. Sewage disposal systems constructed by cities must meet approval of the State Health Board as ordered by law (NDCC, 61-02-21).

A city's influence on the environment is determined in part by its size and location. The three largest incorporated cities in the basin--Valley City, West Fargo, and Lisbon (Figure 1)--are located directly on the banks of the Sheyenne River. Decisions made by the governing bodies in Valley City--the largest municipality in the study area--could have considerable impact on the environment and on the water quality of the Sheyenne River. Figures 2 and 3 show the formal governmental structure of the two types of municipal government that exist in the basin. Only those offices whose decisions could have an impact on the environment are shown in the figures.

Counties

Portions of five counties are in the LSRB. Sargent County was excluded from the study since only parts of two townships are in the LSRB.

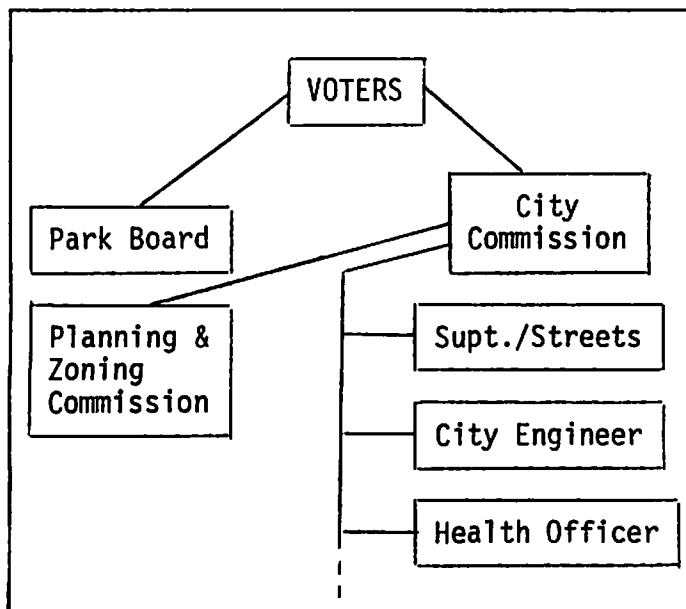


Figure 2. City Commission Form of Government

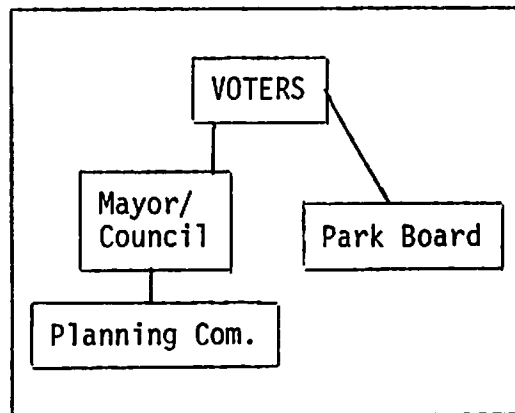


Figure 3. Mayor/Council Form of Government

The four remaining counties--Cass, Barnes, Ransom, and Richland--each have considerable land area in the Basin.

The chief governing board of the county is the five-member Board of County Commissioners. It cannot legislate or pass ordinances; but as a general governing body, it is required by state law to make policies regulating the functions of the many departments. The board has responsibility to levy taxes, make appropriations, dispose and obtain county property, and several other duties specified by state law (League of Women Voters, 1965).

There are other important decision makers at the county level. The State's Attorney is the county's lawyer and acts as chairman of the County Board of Health. County health boards are charged with controlling health nuisances, providing vaccinations, and establishing regulations to preserve health. The county health board oversees public water and sewerage systems under the supervision of the State Health Department. These duties are enumerated in NDCC, 23-05-01.

Section 2 of the same chapter lists additional powers:

"The county board of health, subject to the supervisory control of the state department of health and state health officer shall have the following additional powers within the county and outside corporate limits of any city: to supervise all matters relating to the preservation of life and health of the people of the county, including the supervision of public water supplies and sewerage systems."

The authorization for county park boards is found in Chapter 11-28 of the Century Code. The only clause pertaining to water pollution is NDCC, 11-28-05, subsection 8:

"Prevent the pollution, contamination, or other misuse of any water resource, stream, or body of water under its jurisdiction, supervision, control, or management."

The Century Code does not describe how the boards are to accomplish pollution prevention; thus, they lack specific power to carry it out.

The powers of the county planning commissions are found in section 11-33-01 of the Century Code; townships, section 58-03-12; and city planning commissions, section 40-48-02. The use of land and the location of buildings are regulated and restricted by the planning commissions. They are responsible for land-use zoning to ensure public health and safety. Not all political bodies in the LSRB with zoning authority have land use plans or zoning ordinances.

The county highway engineer is responsible for construction and maintenance of roads and bridges in the county. His recommendations are important to decision making by the county board. Roads are, and contribute to, a change in the environment. Thus, the engineer's recommendations may have considerable impact on the environment.

It is beyond the scope of this report to review all the offices in county organization that make decisions affecting the environment. Figure 4 illustrates the major offices involved with environmental issues at the county level.

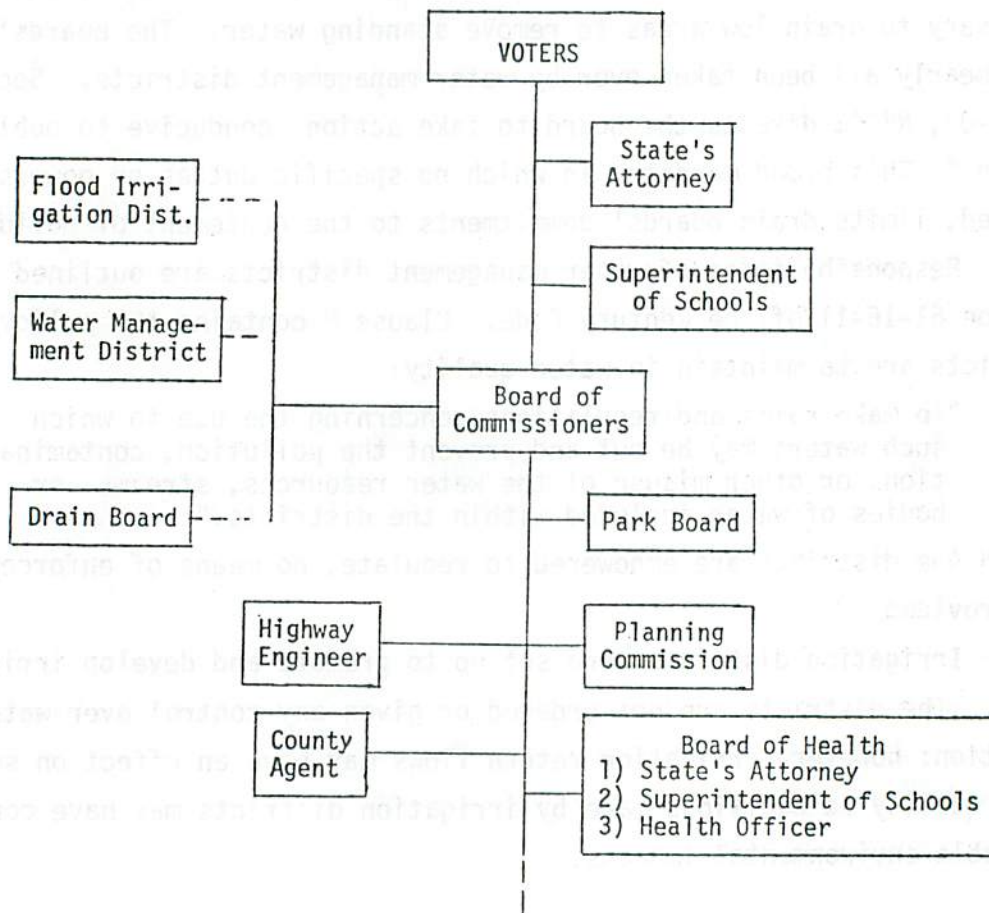


Figure 4. Structure of County Offices and Agencies Involved in Environmental Decision Making

Special Districts

Special districts are governmental bodies formed for a specific functional purpose. Examples of special districts in the LSRB are: flood

control districts, water management districts, drain boards, soil conservation districts, and municipal park districts. Most special districts follow established political boundaries. Soil conservation districts, for example, usually use the county lines as their district boundaries. The Garrison Diversion Conservancy District, a large special district, consists of 25 counties involved in the Garrison Diversion project. All LSRB counties are members of the Garrison Diversion Conservancy District. (Special districts are included in the organization charts of city, county, state, and federal governments.)

Drain boards were established to implement construction of waterways necessary to drain low areas to remove standing water. The boards' powers have nearly all been taken over by water management districts. Section 16-21-02, NDCC, directs the board to take action "conducive to public health." This broad mandate, in which no specific duties or powers are granted, limits drain boards' commitments to the abatement of pollution.

Responsibilities of water management districts are outlined in section 61-16-11 of the Century Code. Clause 8 contains the policy these districts are to maintain in water quality:

"To make rules and regulations concerning the use to which such waters may be put and prevent the pollution, contamination, or other misuse of the water resources, streams, or bodies of water included within the districts."

Though the districts are empowered to regulate, no means of enforcement are provided.

Irrigation districts were set up to promote and develop irrigable lands. The districts are not ordered or given any control over water pollution; however, irrigation return flows may have an effect on surface water quality so decisions made by irrigation districts may have considerable environmental impacts.

State Government

Governmental organization becomes more complex as one moves up through township, city, and county to the state government. There is a myriad of state agencies, boards, councils, committees, and officials involved in environmental decision making (Figure 5).

State government consists of three main bodies: executive, legislative, and judicial. The executive branch includes the governor

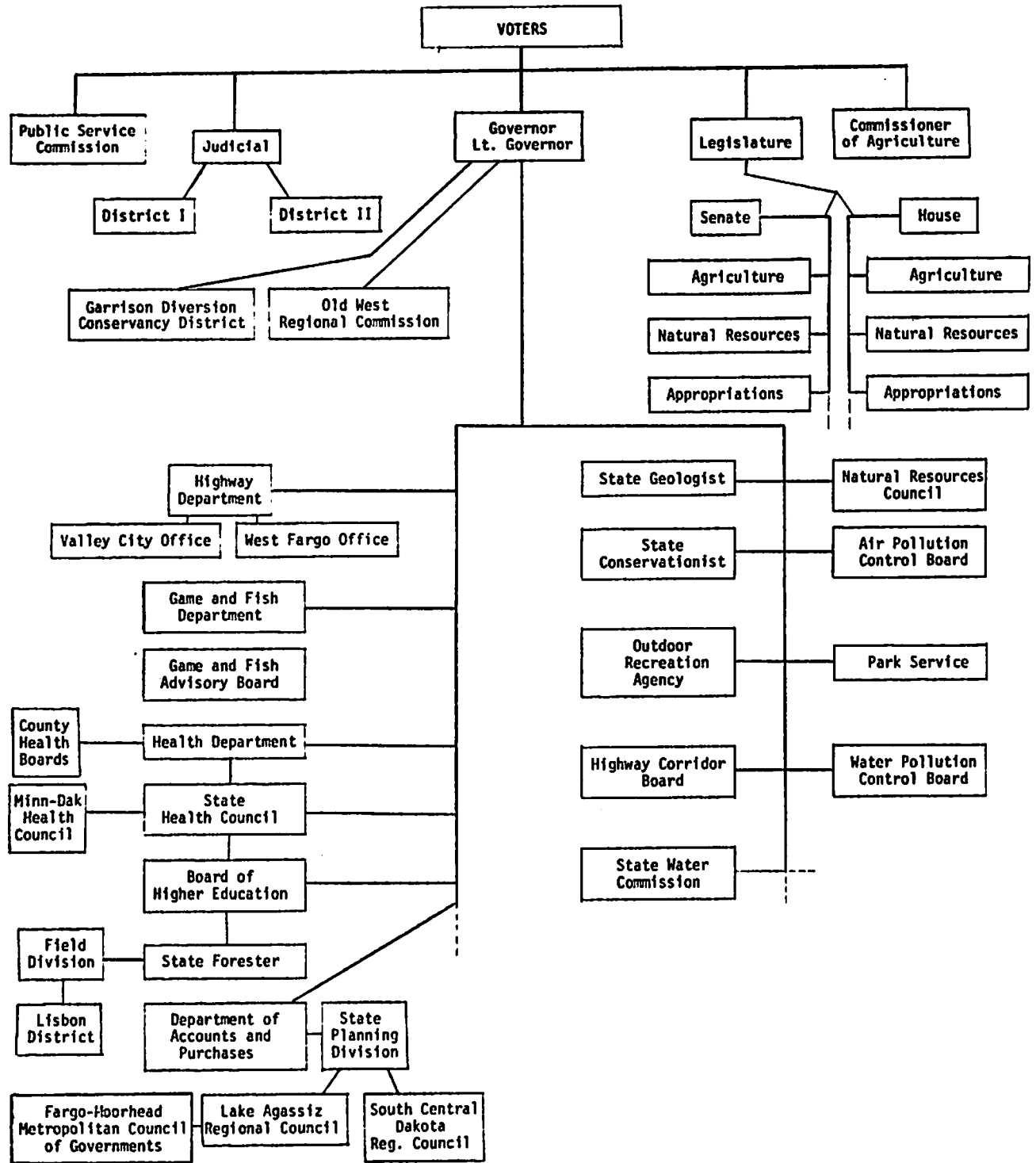


Figure 5. Environmental Decision Makers at the State Level in North Dakota

and a multitude of departments, divisions, boards, and councils. Most boards and councils have no formal power and only recommend policy to the executive or legislature. They are, however, an important influence as a major source of information for the governor.

Outdoor Parks and Recreation Agency--North Dakota state agencies possess a wide range of responsibilities as enumerated in the North Dakota Century Code. The Outdoor Parks and Recreation Agency's responsibility for water quality is set forth in Chapter 53-07-01 of the Century Code, paragraph 2.

". . .2. Initiate a continuing appraisal of the total state recreation resources, potentials, and needs and the adequacy of current efforts to meet the demand."

"Total state recreation resources" include all waters of the state that facilitate water sports. The agency is responsible for knowing the quality of the water although it is not empowered to enforce quality standards.

Game and Fish Department--The duties of the State Game and Fish Department through its commissioner are in section 20.1-02-04 of the Century Code:

"The commissioner shall . . . (6) examine all waters of the state and wherever suitable waters are found, arrange to plant, stock or deposit available fish spawn or fry."

The Department is charged with knowing the condition of the waters in the state, but is not responsible for controlling water quality.

State Planning Division--The State Planning Division was created to act as a center for all other planning commissions within the state. The division's primary responsibility is to coordinate projects and objectives to ensure that one local commission's actions and projects do not hamper or distort a neighboring commission's plans. The state division is to act as a liaison among the local planning commissions and has review power over many federal grants.

Regional planning commissions were organized in 1967 as codified in Chapter 11-35 of the North Dakota Century Code. Section 11-35-01 of the Century Code lists the powers of the commissions as ". . . (they) may exercise any of the powers which are specified and granted to counties, municipal corporations or organized townships in matters of planning and zoning."

State Health Department--The State Health Department receives the following purpose and authority in section 61-28-04 of the Century Code:

"(1) to exercise general supervision of the administration and enforcement of this chapter and all rules and regulations and orders promulgated there under. (2) to develop comprehensive programs for prevention, control, and abatement of new or existing pollution of the waters of the state."

The State Health Department is charged with maintaining an acceptable level of water quality in the state. The department is empowered to ensure water quality by establishing standards and monitoring discharges of wastes and causes of pollution.

The State Water Pollution Prevention Board is authorized in Chapter 61-28 of the Century Code. Its duties are carried out by the State Health Department. The final paragraph of section 61-28-03 of the Code specifies the board's objectives:

"The department (State Health) shall provide the board with copies of maps, plans, documents, studies, surveys, and all other necessary information in order that the board may be fully cognizant of the current status of water pollution and its control in the state and to enable the board to advise the department in development of programs for the prevention and control of pollution of waters in the state."

This advisory board includes selected State Department heads and citizen members appointed by the governor.

State Water Commission--The duties of the State Water Conservation Commission are specified in section 61-02-01 of the NDCC:

"It is hereby declared that the general welfare and the protection of the lives, health, property, and the rights of all people of this state require that the conservation and control of waters in this state, public or private, navigable or unnavigable, surface or subsurface, the control of floods and the regulation and prevention of water pollution involve and necessitate the exercise of the sovereign powers of this state and are affected with and concern a public purpose. It is further declared that any and all exercise of sovereign powers of this state in investigation, constructing, maintaining, regulating, supervising, and controlling any system of works involving such subject matter embraces and concerns a single object, and that the state water conservation commission in the exercise of its powers, and in the performance of all its official duties, shall be considered and constructed to be performing a governmental function for the benefit, welfare, and prosperity of all the people of this state."

The Water Commission is authorized to act as an agent for the state in regulating and preventing water pollution. The powers of the Water

Commission and Health Department are similar, but do not conflict. The Health Department supervises enforcement of regulations (section 61-28-04-1), while the Commission is given the responsibilities of regulating systems which discharge into the waters of the state.

Legislature--The second major branch of state government is the legislative. It consists of the Senate and House of Representatives. These two bodies of elected members are the chief lawmakers of the state. Within each legislative branch there are standing committees where potential rules and regulations affecting components of the environment are drafted, revised, amended, or recommended for passage into law or not. Three standing committees in both the House and Senate with such influence are (1) appropriations, (2) agriculture, and (3) natural resources.

Judicial--The third major branch of state government is the judicial. This is the state's court system. It can settle disputes in the interpretation of state rules and regulations. The courts exercise influence on the environment through their interpretation of state law. They could, for instance, rule on the case of a coal company wanting to conduct strip mining activities that are challenged by an environmental group. Their decision could set a precedent for future legal action in such cases. State Judicial Districts I and III cover the LSRB.

Federal Government

The network of federal agencies that make decisions which affect North Dakota's environment is illustrated in Figure 6. Most federal officials in the state are civil service employees and are, therefore, not directly responsible to the voter. Three notable exceptions are the two U.S. senators and one U.S. Representative elected to represent North Dakota citizens in Washington.

Two of the most important federal agencies involved in environmental issues created by Congress are the Bureau of Sport Fisheries and Wildlife and the Bureau of Reclamation. The Environmental Protection Agency (EPA) came into being in 1970, replacing the Federal Water Quality Administration of the Department of the Interior. President Nixon, in an executive order, July, 1970, established the EPA as a separate agency transferring control of water quality from the Department of the Interior and other federal agencies to the EPA.

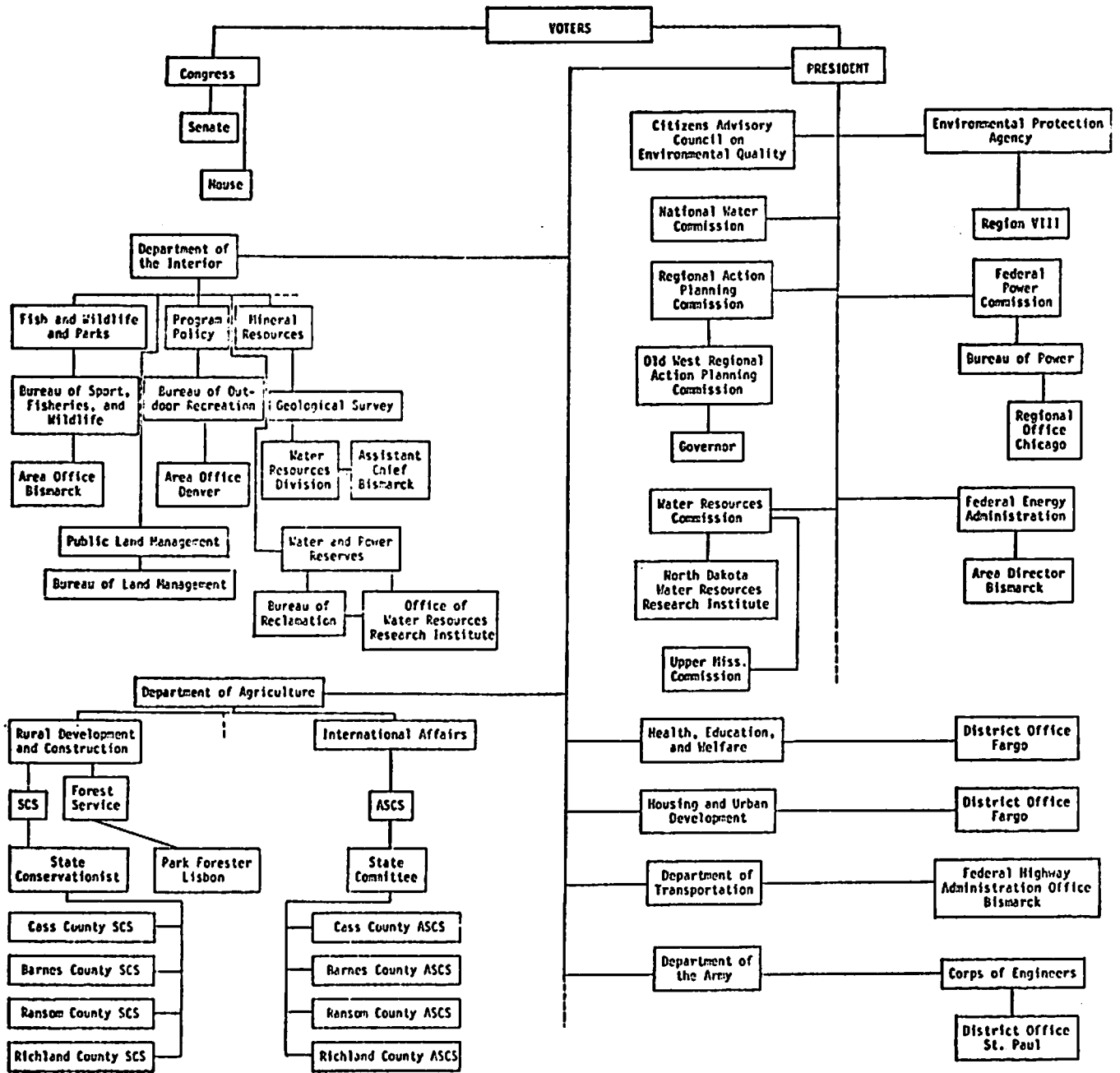


Figure 6. Environmental Decision Makers at the Federal Level in North Dakota

The Department of the Interior is authorized to investigate, construct, and maintain water utilization projects in order to stabilize water supply. The Secretary of the Interior may delegate this authority to the Bureau of Reclamation as provided for in Title 16 section 590(z)(11) of the United States Code (USC). This delegation of authority facilitates the administration of federal reclamation laws. The Bureau of Reclamation is concerned with water, flood control, and land projects of various natures, but it currently has little authority in water quality control (United States Code). The Bureau of Reclamation considers the impact of their projects on the environment, but is not authorized to monitor or control pollution caused by other parties.

The Bureau of Sport Fisheries and Wildlife was established by section 742 of Title 16, United States Code, as a bureau within the Department of the Interior. The Bureau of Sport Fisheries and Wildlife is responsible for all functions pertaining to migratory birds, game management, wildlife refuges, and sport fisheries. Its functions pertaining to water conservation include maintaining and increasing the public opportunities for recreational use of our fish and wildlife resources [16 USC 742(a)]. All authority of the Bureau of Sport Fisheries and Wildlife to control water quality was transferred to the EPA.

The EPA also has the authority to study "effects of the use of chemicals" (16 USC 742d-1) as a result of President Nixon's Reorganization Act 3 in July, 1970. 16 USC 742d-1 reads:

"Studies of Effects in Use of Chemicals. The Administrator of the EPA is authorized and directed to undertake comprehensive continuing studies on the effects of insecticides, herbicides, fungicides, and pesticides, upon the fish and wildlife resources of the United States; for the purpose of determining the amounts, percentages, and formulations of such chemicals that are lethal to or injurious to fish and wildlife and the amounts and percentages, and formulations that can be used safely and thereby prevent losses of fish and wildlife from such spraying and dusting or other treatment."

The Department of Agriculture registers pesticides and monitors their persistence and makes this information available to the EPA for their enforcement.

B. Characteristics of Public Officials

Sources of Information

Three hundred thirty questionnaires were mailed to all levels of governmental decision makers with jurisdiction in the Lower Sheyenne River Basin (LSRB). Questionnaires were sent to most of the offices shown in the organization charts (Figures 2, 3, 4, 5, 6). There were 126 usable questionnaires returned, which represents 35 percent of those receiving questionnaires. The sample of 126 was assumed to be representative of the public decision making population.

This questionnaire was designed with several goals in mind:

1. To determine what influences governmental decision makers.
2. To discover the attitudes of governmental decision makers with different backgrounds and from different agencies toward the environment and the LSRB.
3. To find out more about the formal structure and the informal procedures of the agency.
4. To identify selected individual characteristics of environmental decision makers.

A second questionnaire was sent to 33 agencies and government units expected to be most active in water quality control. Nine questionnaires were sent to state and federal agency officials, seventeen to county officials, and seven to municipal officials in the Lower Sheyenne River Basin (Table 3). Eight federal and state agency officials and a total of twelve county and city officials returned the questionnaires. All types of agencies, except irrigation districts and drainage boards, responded. The following discussion is based on the 126 responses to the first survey, except when the second survey is specifically mentioned.

Demographic Characteristics

The respondents' ages reveal an even distribution of age groups over 30 years (Table 4). Only 3 percent of the respondents were under 30 years of age.

The respondents' educational level increased as one moved from the local to special district to the state and federal level of government (Table 5).

TABLE 3. AGENCIES WHICH RECEIVED THE SECOND QUESTIONNAIRE

Federal and State Agencies

Bureau of Reclamation
Bureau of Sport Fisheries and Wildlife
Environmental Protection Agency
Lake Agassiz Regional Resource Conservation and Development
State Health Department
State Game and Fish Department
State Planning Division
State Outdoor Recreation
Garrison Diversion Conservancy District

County Agencies

Barnes County Health Committee
Barnes County Planning Commission
Barnes County Park Board
Barnes County Water Management District
Cass County Health Committee
Cass County Planning Commission
Cass County Park Board
Southeast Cass County Water Management District
Ransom County Health Committee
Ransom County Planning Commission
Ransom County Park Board
Richland County Health Committee
Richland County Planning Commission
Richland County Park Board
Richland County Water Management District
Cass County Drainage Board
Tri-County Irrigation District

Municipalities

Elliott
Horace
Kathryn
Kindred
Lisbon
Valley City
West Fargo

Political Ideology

The political character or ideology of the respondents can be an important variable in determining their responses to environmental decision making (Table 6). The majority of responses are toward the conservative end of the spectrum. By their own categorization, state and federal officials were more liberal than local or special district personnel.

TABLE 4. AGE OF DECISION MAKERS SURVEYED IN THE LSRB, 1974

Age	Level of Government			Total
	Local	Special District	State/Federal	
	----- percentage -----			
Under 30 Years	2	0	5	3
30-39	19	10	26	19
40-49	29	23	27	27
50-59	27	47	21	29
60 +	23	20	21	22
	100	100	100	100

TABLE 5. FORMAL EDUCATION OF DECISION MAKERS IN THE LSRB, 1974

Level of Education	Level of Government			Total
	Local	Special District	State/Federal	
	----- percentage -----			
1-6 Years	0	0	0	0
7-9 Years	13	3	0	7
10-12 Years	26	33	10	23
Under 2 Years College	19	6	10	13
2-4 Years College	8	13	13	11
College Graduate	17	32	31	24
Advanced Degree	17	13	36	22
	100	100	100	100

TABLE 6. POLITICAL CHARACTER OF DECISION MAKERS SURVEYED IN LSRB, 1974

Political Ideology	Level of Government			Total
	Local	Special District	State/Federal	
	----- percentage -----			
Very Conservative	6	0	3	3
Moderately Conservative	60	52	30	48
Middle of the Road	18	26	19	20
Moderately Liberal	16	22	35	24
Very Liberal	0	0	5	2
Do Not Know	0	0	8	3
	100	100	100	100

Organizational Membership

Membership in voluntary associations is usually associated with a greater interest in public affairs and community activities (Warren, 1958).

Joiners of voluntary associations frequently have motives for joining other than social contact. They hope to become better informed about community affairs and to influence policy making in such affairs through contacts with formal policy makers.

Influential individuals and voluntary associations can be important elements in the forming of local policy. It is beneficial in furthering their cause to supplement their own resources by operating on or through an institutionalized group (Truman). Interest groups are a source of pressure because they are formal organizations with voting citizens as members and because they have more available resources than an individual. For those in a community who would like to influence decisions, one channel through which their influence can be felt is an association of some kind (Bernard).

Thirty percent of the respondents associated with local levels of government said they belonged to five or more voluntary associations (Table 7). Twenty-eight percent of the special district members and 47 percent of the state and federal respondents belonged to five or more voluntary associations. The type of association was closely associated with their occupation. Farmers, for example, belonged to farm organizations and fish and game personnel to wildlife-oriented organizations. Nearly all decision makers in the LSRB were aware of the interests of several associations and pressure groups.

TABLE 7. MEMBERSHIP IN VOLUNTARY ASSOCIATIONS BY DECISION MAKERS SURVEYED IN THE LSRB, 1974

Extent of Membership	Level of Government		
	Local	Special District	State/Federal
	----- percentage -----		
Belong to None	8	16	21
Belong to One	16	9	0
Belong to Two	10	6	3
Belong to Three	26	22	13
Belong to Four	10	19	16
Belong to Five or More	30	28	47
	<u>100</u>	<u>100</u>	<u>100</u>

Influence on Public Officials

Sixty percent of the respondents stated there was a single organization or interest group that they could identify as being the most influential in

determining what their agency does. The most frequent response was one of the other governmental agencies. Farmers and farm organizations were the next most common response given as influential in decision making. The general public was mentioned as a source of influence by six respondents. Some form of a chamber of commerce was mentioned at least once by each category of respondents. Recreationists were mentioned four times. Business and industry showed up as an influence at least once in each group. One respondent said the League of Women Voters was influential at the local level.

Each of the agencies of the LSRB was commissioned to serve all of or some segment of the population. When asked who their clientele were, two-thirds of the respondents answered "the general public" (Table 8). The only significant difference was the special district category with 47 percent saying they primarily served agriculturalists. No other group was mentioned by more than 5 percent of the respondents.

TABLE 8. RESPONDENTS' OPINION OF THEIR AGENCY'S CLIENTELE, LSRB, 1974

Clientele	Level of Government			Total
	Local	Special District	State/Federal	
	----- percentage -----			
General Public	67	47	68	63
Agriculturalists	18	47	10	23
Small Business	3	2	2	3
Large Business and Corporations _c	0	2	0	1
Homemakers	2	0	0	1
People Interested in Recreation	7	0	7	5
No Response	3	2	13	4
	100	100	100	100

Most of the respondents said they would respect a farmer's opinion most if a decision involving a large sum of money were to confront the respondent's agency (Table 9).¹ A large number of the respondents were farmers. Thirty

¹The question asked about a decision where a large sum of money was involved could have caused the respondent to answer differently than he would have if the question were on a political issue, such as water rights.

TABLE 9. OCCUPATIONAL CATEGORIES WHOSE OPINIONS RESPONDENTS RESPECT CONCERNING DECISIONS INVOLVING LARGE SUMS OF MONEY, LSRB, 1974

Occupation	Most Respected				Least Respected			
	Local	Special Dist.	State/Federal	Total	Local	Special Dist.	State/Federal	Total
	----- percentage -----							
Lawyer	10	15	9	9	3	0	18	5
City Councilman	8	15	0	8	0	6	0	1
Banker	20	25	6	19	0	0	0	0
College Teacher	0	0	0	0	10	11	17	12
Farmer	38*	40*	25*	33*	0	0	0	0
Mayor	8	0	18	12	3	0	0	1
City Administrator	3	0	6	3	0	0	0	0
Newspaper Editor	0	0	0	0	15	11	12	13
Electrician	0	0	0	0	23	11	23*	21
Businessman	10	5	6	8	0	6	0	1
Doctor	3	0	6	3	5	5	18	8
Carpenter	0	0	0	0	3	11	12	7
Politician	0	0	24	5	38*	39*	0	31*
	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>

*Most frequent response.

percent of the respondents said they respected a politician's opinion the least out of a field of 13 choices. This was surprising as the respondents, based on their holding a government office, were politicians or 48 percent of the respondents could be classified as quasi-politicians since they were appointed by the governor, a mayor, or some other elected individual.

How governmental decision makers perceive their position in the decision-making process is important in assessing their decisions. The largest group of respondents (37 percent) said they do what they themselves think best for their government body. This is the Burkean thesis known as "virtual representation." It depicts the representative as a free agent who reserves the right to make up his own mind. "Burke claims that because the member is elected on the basis of his special qualities, he owes his constituents a frank expression of his better judgment in legislative matters" (Ibele). The next largest group of respondents (29 percent) said government officials usually do what the citizens want. This view is contrary to the Burkean thesis and is called

"real" representation. The legislator is expected to vote the way his constituents want, regardless of his own beliefs. A third group of respondents (22 percent) said government officials usually do what some of the more influential people want. This is similar to party loyalty and maintains its rewards as long as the power structure does not change. Only a small number of respondents said government officials usually look out for their own private interests.

C. Environmental Attitudes and Activities

Degree of the Environmental Problem

Local and special district elected and appointed officials indicated there were minor environmental problems and some indicated there were major environmental problems in the LSRB, but no crisis situations. Thirty-one percent of local appointed officials felt there was a major crisis with clear and present dangers as did 23 percent of special district appointed officials. A few of the local and special district officials chose the following survey responses: (1) no crisis, only in some people's minds; (2) a possible crisis, but a long way off; and (3) minor crisis with only a few immediate dangers.

Responses of state and federal elected officials were evenly split (25 percent each) among (1) no crisis, only in some people's minds; (2) a few major problems, but no crisis; and (3) major crisis with clear and present dangers. Forty-two percent of state and federal appointed officials felt there was a major environmental crisis with clear and present dangers; while 20 percent indicated there were a few major problems, but no crisis. The majority felt there were a few environmental problems, but no crisis. Nearly one-third, however, indicated there is a major crisis with clear and present dangers.

When asked if their agency had ignored any significant environmental issues in the past two years, only 13 percent of the respondents answered yes. These responses ranged from "just about all" to "no, but some people think so." Problems ignored were: "pollution," "water pollution," "poor agricultural land management," "solid waste," and "pollution from the internal combustion engine." From this limited number of positive responses, one can draw two conclusions. Either (1) the majority felt their agencies

had not encountered any significant issues or (2) they had ignored them. Reasons for ignoring issues could be lack of expertise, funding, man power, jurisdiction, and others.

Fifty-six percent of the respondents answered that they agency had become involved in the past two years with one or more environmental issues. The issues mentioned were similar to those mentioned as ignored in the previous paragraph. Local and special district respondents gave specific examples, while state and federal respondents gave general areas of involvement.

Types of Pollution

Respondents were asked to rank seven types of environmental pollution in North Dakota according to their degree of importance. The local respondents rated water pollution number one (Table 10). This could be due to many of the local decision makers living near the Sheyenne River and are sensitive to its condition.

Destruction of natural resources, such as land erosion, was ranked as the most significant type of pollution in the LSRB by the special district members. Many of the special districts, such as the Soil Conservation Service and Agricultural Stabilization and Conservation Service, work closely with soil conservation activities. They ranked water pollution as the second most important type of pollution.

State and federal respondents also chose destruction of natural resources as the number one pollutant factor and water pollution as a close second.

Noise pollution was unanimously ranked as the least significant contributor to overall pollution in North Dakota. Urban congestion also was not identified as an important type of pollution since North Dakota is one of the most sparsely populated states.

Control of Pollution

All three categories of respondents agreed the best way to control environmental problems is through long-range comprehensive planning (Table 11). The local respondents (66 percent) were less inclined to favor long-range planning than were the special district or state and federal groups. The

TABLE 10. RELATIVE IMPORTANCE OF TYPES OF POLLUTION IN NORTH DAKOTA AS PERCEIVED BY PUBLIC DECISION MAKERS IN THE LSRB, 1974

Source of Pollution	Level of Government											
	Local				Special District				State/Federal			
	1st ^a	2nd	3rd	7th ^b	1st ^a	2nd	3rd	7th ^b	1st ^a	2nd	3rd	7th ^b
	----- percentage -----											
Noise	2	2	15	<u>41^c</u>	0	0	4	<u>46</u>	0	0	3	<u>42</u>
Water Pollution	<u>48</u>	<u>43</u>	8	4	8	<u>31</u>	<u>36</u>	0	17	<u>40</u>	18	0
Urban Congestion, People Pollution	14	4	5	25	12	9	0	21	3	3	0	34
Chemical Pollution of Soils	14	13	24	4	4	17	17	4	9	15	<u>28</u>	6
Destruction of Natural Resources, Such as Soil Erosion	12	23	<u>25</u>	0	<u>68</u>	17	17	0	<u>54</u>	21	12	0
Air Pollution	6	2	3	13	4	9	13	12	11	15	15	6
Destruction of Natural Beauty	<u>4</u>	<u>13</u>	<u>20</u>	<u>13</u>	<u>4</u>	<u>17</u>	<u>13</u>	<u>17</u>	<u>6</u>	<u>6</u>	<u>24</u>	<u>12</u>
	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>

^aContributes most to overall pollution.

^bContributes least.

^cThe highest percentage is underlined in each column.

TABLE 11. RESPONDENTS' ATTITUDES ON HOW TO DEAL WITH ENVIRONMENTAL PROBLEMS, LSRB, 1974

Way to Handle Problem	Level of Government		
	Local	Special District	State/Federal
	- - - - - percentage - - - - -		
Should Be Left Alone to Take Care of Themselves	0	0	0
Each Individual Problem Dealt With As It Comes Up	13	14	2
Each General Type of Problem Should Be Handled Separately	21	14	9
Long-Range Planning for All Problems Together	66	72	89
	<u>100</u>	<u>100</u>	<u>100</u>

state and federal group was 89 percent in favor of long-range planning. This outcome is consistent with the respondents' political ideology discussed previously. It also is consistent with the greater degree of experience in long-range planning possessed by state and federal groups.

Population Policy

Population density is a major factor affecting the environment. High population densities generate high levels of sewage, solid waste, and air contaminants. Private wells, sewage systems, and solid waste systems may not cause any serious environmental problems in sparsely populated rural areas; however, they can cause serious damage to the environment in or near urban areas. This did not seem to deter the respondents from supporting population increases as a majority of respondents favored an increase in North Dakota's population (Table 12). Thirty-two percent of the special district group, however, were against any increase in population. Seven percent of the respondents answered that they do not care if the population increases.

Most of the local decision makers who wanted to see an increase in population wanted it to occur by keeping North Dakota's youth in the state. The remainder preferred a combination of in-migration and keeping youth in the state. Special district members in favor of an increase were slightly more favorable to combined in-migration and youth than only to keeping youth. The state and federal respondents replied similar to the local respondents.

TABLE 12. RESPONDENTS' ATTITUDES TOWARD CHANGES IN NORTH DAKOTA'S POPULATION, LSRB, 1974

Response	Level of Government			Total
	Local	Special District	State/Federal	
	----- percentage -----			
Would Like to See Increase	76	61	65	68
Do Not Want an Increase	18	32	28	25
Do Not Care One Way or the Other	<u>6</u>	<u>7</u>	<u>7</u>	<u>7</u>
	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>

Want Increase by In-Migration	0	0	4	1
Want to Keep Youth in the State	61	45	58	57
Want Both In-Migration and to Keep Youth in State	<u>39</u>	<u>55</u>	<u>38</u>	<u>44</u>
	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>

A majority of the three respondent groups favored more industry for North Dakota. Most of the respondents wanted agriculturally related industries--either agricultural machinery manufacturing or food processing. Most of the respondents also wanted "clean" or "light" industries, while only a few wanted heavy industry. A conflict may exist since many agricultural processing industries are not "clean" industries. They are heavy water users and occasionally are bad smelling. A small percentage of the respondents were in favor of developing North Dakota's coal resources. Respondents may have been in favor of more industry to bolster employment and felt this was more important than its adverse effects.

Sheyenne River

Decision makers were asked if they had recently read or heard about recreational opportunities, reservoir or dam building, flooding or flood control, irrigation, sewage treatment or disposal, industrial development, and pollution levels or control in relation to the Sheyenne River. All three categories of respondents gave similar replies. About one-third of the respondents were aware of three of these activities. At the local level only 6 percent of the respondents were familiar with each of the seven items; whereas, at the state and federal level 14 percent claimed familiarity with all seven activities.

Use of the Sheyenne River

The number of different leisure-time activities pursued by respondents in or near the river basin was related to their location of residence. There was little use of the river involving bodily contact with the water, such as swimming or water skiing. Most of the recreational activity involved the river indirectly--hunting, camping, snowmobiling, picnicing, and hiking. Only one respondent answered that he swam in the river. Fishing, a direct use of the river, was a popular pastime among local respondents.

Eighty-eight percent of all respondents were concerned about the water quality in the Sheyenne River. Local respondent concerns were: low water levels, livestock operations close to the river, and household sewage dumping into the river. State and federal respondents expressed concern about pollution in a general sense.

Respondents were asked to rate various uses of the Sheyenne in order of importance. All three levels of respondents ranked one of four uses in the top three (Table 13): (1) fish and wildlife habitat, (2) water sports and recreation, (3) public water supply, or (4) irrigation water supply was either first, second, or third choice of the three categories of respondents.

TABLE 13. RESPONDENTS' OPINIONS ON PRECEDENCE OF USES OF THE SHEYENNE RIVER, 1974

Use	Level of Government											
	Local				Special District				State/Federal			
	1st ^a	2nd	3rd	6th	1st ^a	2nd	3rd	6th	1st ^a	2nd	3rd	6th
	----- percentage -----											
Fish and Wildlife Habitat	<u>61</u>	24	9	0	33	<u>40</u>	7	0	29	<u>26</u>	24	0
Public Water Supply	29	26	21	5	<u>50</u>	18	20	0	<u>62</u>	21	9	0
Waste Disposal	2	6	4	<u>50</u>	<u>0</u>	0	0	<u>90</u>	<u>0</u>	9	0	<u>78</u>
Water Sports and Recreation	0	<u>31</u>	30	9	7	21	<u>42</u>	0	0	20	<u>34</u>	0
Irrigation Water Supply	4	11	<u>34</u>	7	10	18	10	0	9	9	24	6
Industrial and Commercial Use	4	<u>2</u>	<u>2</u>	29	0	3	<u>21</u>	<u>10</u>	0	<u>15</u>	9	<u>16</u>
	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>

^a1st means first most important use.

Organizational Activities

Six agency respondents had activities or programs which influence or are affected by the use and quality of water in the Lower Sheyenne River Basin.² Twelve agency respondents said they have no such activities in the area and two did not answer the question (Table 14). Federal and state governments apparently had more activity involving the use and quality of water than local government bodies.

TABLE 14. NUMBER OF AGENCIES WITH ACTIVITIES RELATED TO WATER IN THE SHEYENNE RIVER,^a 1974

Agency	Yes	No	No Response
Federal and State	4	3	1
Local	2	9	1
Totals	6	12	2

^aBased on second survey.

The state and federal activities were primarily new or future programs, except for the State Health Department which currently monitors the water quality in this area. The Lake Agassiz Regional Resource Conservation and Development Council also has some activities related to water in the LSRB.

The two local governments with activities associated with water use and quality were involved in planning and recreational activities. One of the local governments was the only respondent to give top priority to its activity in the LSRB. No other government unit or agency rated its activity in the LSRB higher than third among their responsibilities.

Four of the 20 respondents thought return flows from irrigated land will be a problem. Each of these respondents represented state or federal levels of government and were associated with wildlife or health interests. Three of these four respondents were not satisfied with either the current regulations or the enforcement of current regulations.

²This section is based on responses from 20 organization representatives in the second survey.

None of the representatives of local government units indicated irrigation would be a problem. The majority of all respondents stated satisfaction with current regulations and their enforcement. Many who indicated irrigation return flows would not be a problem added qualifications to their answers. The most common qualification was "there might be pollution, but careful irrigation management should help solve it if not eliminate it." "Benefits from irrigation far outweigh the problems that might be created" was the second most frequent comment.

D. Conclusions

This report has presented an outline of the complex network of government jurisdictions in the Lower Sheyenne River Basin. Some of the influences on governmental decision makers were discussed and presented in tabular form. Membership in voluntary associations, for example, was identified as an influence on decision making. Respondents' attitudes about the environment ranged from very optimistic to alarmist. LSRB decision makers responded to environmental questions depending upon their role in the governmental system. Several characteristics of LSRB decision makers were investigated and in many areas there was a relationship between government position and response.

Specific conclusions are:

1. Government agencies were mentioned by the largest number of respondents as being most influential in determining the actions of their organization, the general public was cited by two-thirds of the respondents as the primary clientele of their organization, and a farmer's opinion was most respected by the respondents on decisions involving large sums of money. These differences are potential sources of conflict within organizations.
2. Local level elected and appointed people in government service apparently did not consider themselves as "politicians."
3. LSRB decision makers claim to be politically conservative.
4. Elected and appointed decision makers at the same level of government have different attitudes on several issues; however, the attitudes of officials on some issues appear to be related to the level of government.
5. A large number of the agencies are legally required to know the quality of the water in their jurisdiction. Ten agencies stated support for existing regulations even though they have little authority when it comes to enforcing these regulations.

6. Agencies affiliated with wildlife, fish, and recreation voiced the most concern for water quality. They stated they would support legislation to aid in abatement of pollution and terminate existing causes.
7. The State Health Department and the EPA are the agencies presently possessing authority to monitor and control water pollution.
8. State and federal agencies indicated more concern about water quality problems than local and special district respondents.
9. Most of the respondents felt that there were environmental problems in the LSRB, but no crisis situation.
10. Water pollution and destruction of natural resources were ranked as the two most important environmental problems in North Dakota.
11. Long-range comprehensive planning was the favored method to deal with environmental problems.
12. Most respondents favored a population increase in North Dakota through keeping youth in the state and more than one-third also favor in-migration.
13. Nearly all respondents were concerned about water quality in the Sheyenne River.
14. Important uses of the Sheyenne River mentioned most frequently by respondents were fish and wildlife habitat, water sports and recreation, public water supply, and irrigation water supply.

References

- ABC's of County Government in North Dakota, North Dakota Agricultural College Extension Service, Fargo (undated).
- Agricultural Economics Department, North Dakota State University, personal communication with numerous researchers about their studies and unpublished data, 1974.
- Almand, J. D., "Federal Programs Affecting Wildlife," A Manual of Wildlife Conservation, R. D. Teague, Ed., The Wildlife Society, Washington, D.C., 1971.
- Barker, W. T., and W. C. Nelson, Sheyenne River Basin--Water, Land, People, North Dakota Research Report No. 55, North Dakota State University, Fargo, 1974.
- Bernard, J., American Community Behavior, Holt, Rinehart, and Winston, New York, 1962.
- Brand, W. L., and J. G. Hector, Eds., North Dakota Decision Makers, Analytical Statistics, Incorporated, Fargo, North Dakota, 1972.
- Bureau of Reclamation, Annual Report of North Dakota Development Farms, Bureau of Reclamation Upper Missouri Region, Washington, D.C., 1972.
- _____, Garrison Diversion Environmental Impact Statement (EIS), Bureau of Reclamation Upper Missouri Region, Washington, D.C., 1973.
- Carter, S., L. Sumek, and M. Frost, "Local Environmental Management," The Municipal Yearbook, International City Management Association, Washington, D.C., pp. 255-264, 1974.
- Crockett, Richard B., An Analysis of Local Water-Related Districts in North Dakota, North Dakota Water Resources Research Institute, Fargo, 1972.
- Eshetu, Telahoun, "Land Use Planning: An Analysis of People's Attitudes in Region VI," Unpublished M.S. Thesis, Department of Agricultural Economics, North Dakota State University, Fargo, 1977.
- Falk, L. L., Attitudes and Social Characteristics of Farm and Rural Nonfarm Persons Living Adjacent to the Sheyenne River of North Dakota, NDWRRRI Technical Report No. WI-312-002-77, North Dakota State University, Fargo, 1977.
- Falk, L. L., W. C. Nelson, and D. L. Helgeson, "Social and Economic Characteristics of the Lower Sheyenne River Basin," Sheyenne River Basin--Water, Land, People, North Dakota Research Report No. 55, North Dakota State University, Fargo, 1974.

- Ibele, O. H., Political Science, Chandler Publishing Company, Scranton, 1971.
- League of Women Voters of the Fargo Area, Let's Look at Fargo--West Fargo, Box 1010, Fargo, North Dakota, 1970.
- _____, The Structure and Operation of Cass County Government, Box 1010, Fargo, North Dakota, 1965.
- Martens, Sharon W., Reorganization of County Government in North Dakota, University of North Dakota Bureau of Governmental Affairs Special Report #10, Grand Forks, 1970.
- Meier, B., Directory, State of North Dakota--Officials, Boards, Institutions, Globe Gazette, Wahpeton, North Dakota, 1973.
- North Dakota Blue Book, Bismarck, North Dakota, 1973.
- North Dakota Century Code.
- North Dakota Motor Carriers Association, Lawmakers of North Dakota, Bismarck, North Dakota, 1973.
- North Dakota State Soil Conservation Committee, North Dakota Soil Conservation Districts Directory, Bismarck, North Dakota, 1973.
- North Dakota Water Resources Research Institute, unpublished report on community water conferences in North Dakota, North Dakota State University, Fargo, 1972.
- Omdahl, L., H. Tomasek, and B. Wright, North Dakota Government, University of North Dakota Bureau of Governmental Affairs, Grand Forks, 1973.
- State Library Commission, North Dakota State Government--The Principal Duties of the Various Agencies of Our State Government, Bismarck, North Dakota, 1973.
- Tomasek, H., and B. Wright, Resource Book for North Dakota Government, University of North Dakota Bureau of Governmental Affairs, Grand Forks, 1973.
- Truman, D. B., The Governmental Process, Alfred A. Knopf, New York, 1951.
- Warren, R. L., Ed., "Perspectives on the American Community," American Sociological Review 23:286-295, June, 1958.
- Warren, R. L., Studying Your Community, Russell Sage Foundation, New York, 1955.
- Water Information Center, Inc., Water Atlas of the United States, Port Washington, New York, 1973.

United States Code.

United States Government Organization Manual, 1972-73, Office of the
Federal Register, Washington, D.C., 1972.

United States Government Telephone Directory, North Dakota, General
Services Administration, Washington, D.C., 1974.

Reports and Papers of the Sheyenne
River Basin Project Team

1974

- Kunkel, Steven, "Bacteriological Study of the Lower Sheyenne River," Unpublished M.S. Thesis, Department of Bacteriology, North Dakota State University, Fargo, 1974.
- _____, and Mary C. Bromel, "The Use of Fluorescent Antibody for the Rapid Detection of Salmonella in Water," presented at North Dakota Academy of Science Annual Meeting, awarded first prize in Graduate Student Competition, Fargo, North Dakota, April, 1974.
- Leitch, Jay, "Environmental Decision Making in the Lower Sheyenne River Basin," Unpublished Paper, North Dakota State University, Fargo, November, 1974.
- Saxowsky, David, "A Comparative Study of Attitudes of Agencies Authorized to and Agencies Concerned About the Control of Water Quality in the Sheyenne River," Unpublished Paper, North Dakota State University, December, 1974.
- Sheyenne River Basin Research Team, Lower Sheyenne River Basin: Water-Land-People, North Dakota Research Report No. 55 and North Dakota WRRRI Project Report No. WI-222-005-75 (completion report of B-029), North Dakota State University, Fargo, 1974.
- Tweeten, Thomas, A Method Study of Trace Metal Determinations, Unpublished M.S. Thesis, Department of Chemistry, North Dakota State University, Fargo, 1974.

1975

- Falk, Laurence L., "Birds Censusing: A Review of the Literature," Unpublished Paper, Concordia College, Moorhead, Minnesota, 1975.
- _____, "On Birds and People: A Comparison of Censusing," paper presented was the Fifth Annual Tri-College University Soc./Anthro. Convention, Moorhead, Minnesota, April, 1975.
- Hanson, Jon, "A Phytosociological Study of the Bur Oak Savanna in South-eastern North Dakota," Unpublished M.S. Thesis, Department of Botany, North Dakota State University, Fargo, 1975.

1975 (continued)

Leitch, Jay A., "Application of Five Methods for Measurement of Wildlife Value; Lower Sheyenne River Basin, North Dakota," Unpublished M.S. Thesis, Department of Agricultural Economics, North Dakota State University, Fargo, 1975.

Reagan, Ross S., "Application and Evaluation of the River Basin Model," Unpublished M.S. Thesis, Department of Community and Regional Planning, North Dakota State University, Fargo, 1975.

_____, "River Basin Planning - Land and Water Management Problems of the Lower Sheyenne River Basin," Unpublished Paper, North Dakota State University, February, 1975.

1976

Bromel, M. C., "Bacteriological Analysis of the Sheyenne River," Biology Report to the International Joint Commission on the Garrison Diversion, pp. 182-186, 1976.

Ehni, Rodney, "Economic and Environmental Effects of Agricultural Management Decisions in the Lower Sheyenne River Basin," Unpublished M.S. Thesis, Department of Agricultural Economics, North Dakota State University, December, 1976.

Grosz, David, "Bacteriological Analysis of the Sheyenne River from 1974-1976," Unpublished M.S. Thesis, Department of Bacteriology, North Dakota State University, Fargo, 1976.

Kunkel, S. L., and M. C. Bromel, "Use of Fluorescent Antibody for Rapid Detection of Salmonella in Water," Proceedings of N.D. Academy of Science, Vol. 28, pp. 101-105, 1976.

Leitch, Jay, and W. C. Nelson, Economic Value of Wildlife in the Lower Sheyenne River Basin - Comparison of Four Techniques, Agricultural Economics Report No. 114, North Dakota State University, Fargo, July, 1976.

_____, Environmental Trade-Offs in the Lower Sheyenne Valley, Agricultural Economics Report No. 116, North Dakota State University, Fargo, August, 1976.

Nelson, William C., and Rodney J. Ehni, "Land Use and Nonpoint Pollution in the Sheyenne Valley," North Dakota Farm Research, Vol. 34, pp. 25-26, November-December, 1976.

1976 (continued)

Runge, Damian, et al., "Lower Sheyenne River Basin Basic Pollution Model," Unpublished Paper, Department of Agricultural Economics, North Dakota State University, Fargo, 1976.

_____, "Lower Sheyenne River Basin Model Source Programs and Data Base," Unpublished Paper, Department of Agricultural Economics, North Dakota State University, Fargo, 1976.

1977

Ehni, Rodney J., and William C. Nelson, Economic and Environmental Effects of Agricultural Management Decisions in the Lower Sheyenne River Basin, Agricultural Economics Report No. _____, North Dakota State University, forthcoming, 1977.

Falk, Laurence L., A Population Profile of Lower Sheyenne River Basin in North Dakota, North Dakota WRRRI Technical Bulletin No. WI-312-003-77, North Dakota State University, Fargo, forthcoming, 1977.

_____, Attitudes and Social Characteristics of Farm and Rural Nonfarm Persons Living Adjacent to the Sheyenne River of North Dakota, North Dakota WRRRI Technical Report No. WI-312-002-77, North Dakota State University, Fargo, July, 1977.

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