MINUTES

North Dakota State Water Commission
Meeting Held in Vocational
Education Conference Room
State Office Building
Bismarck, North Dakota

September 27, 1973

The North Dakota State Water Commission held a meeting in the Vocational Education Conference Room, State Office Building, Bismarck, North Dakota, on Thursday, September 27, 1973. Secretary Fahy indicated that Governor-Chairman Arthur A. Link would be late in coming to the meeting, as he was attending another meeting; therefore, the Commission meeting was called to order by Vice Chairman, Richard Gallagher, at 10:30 a.m., CDT.

MEMBERS PRESENT:
Arthur A. Link, Governor-Chairman
Richard Gallagher, Vice Chairman, Mandan
James Jungroth, Member from Jamestown
Alvin Kramer, Member from Minot
Gordon Gray, Member from Valley City
Donald Noteboom, Member from McKenzie County
Arne Dahl, Commissioner, Department of Agriculture, Bismarck
Vernon Fahy, Secretary and State Engineer, North Dakota State Water Commission, Bismarck

OTHERS PRESENT:
Matt Emerson, Assistant Secretary, North Dakota State Water Commission, Bismarck
Cliff Jochim, Director of Legal Services, North Dakota State Water Commission, Bismarck
H. A. Hendrickson, Fargo
Russell Dushinske, Executive Vice President, North Dakota Water Users Association, Inc., Minot
James Eastgate, Burleigh County Water Management District, Bismarck
Dr. Dale Anderson, Director of Water Resources Research Institute, North Dakota State University, Fargo
Thomas Pearce, United Power Association, Bismarck
John C. Kapsner, North Dakota Attorney General's Office, Bismarck
Lucille Hendrickson, Bismarck Tribune, Bismarck
Mike Jacobs, Mandan Morning Pioneer, Mandan
Ken Karls, The Nokota Company, Mandan
Dewey Heggen, KFYR Radio-TV Station, Bismarck
Terry Dullam, KXMB-TV Station, Bismarck
Kenneth S. Vig, Minnkota Power Cooperative, Inc., Grand Forks

Joseph A. Vogel, Jr., Mandan
James L. Sack, Center
Lenore Sack, Center
Charles A. Koch, U. S. Bureau of Mines, Bismarck
Frank J. Belinskey, Office of Economic Opportunity, Bismarck
R. J. Sailer, Bismarck
C. H. Aubol, Motor Vehicle Department, Bismarck
O. Leonard Orvedal, Bismarck
Milo W. Hoisveen, Bismarck
Gus Bougie, Minnkota Power Cooperative, Inc., Grand Forks

MINUTES OF AUGUST 29, 1973 MEETING - APPROVED

It was moved by Commissioner Kramer seconded by Commissioner Jungroth and carried, that reading of the minutes of the August 29, 1973 meeting be dispensed with and they be approved as circulated.

REQUEST BY HETTINGER COUNTY WATER MANAGEMENT DISTRICT FOR FINANCIAL PARTICIPATION IN THE CONSTRUCTION OF INDIAN CREEK DAM (#1556)

Secretary Fahy indicated that a meeting had been held with proponents of the Indian Creek Dam project on September 26, 1973. He reviewed the physical features of the proposed project and also the cost formulations of project costs. The State Game and Fish Department, through a federal project, was able to obtain 75 percent matching monies needed for land acquisition and this phase of the project would begin immediately. Secretary Fahy stated that the Hettinger County Water Management District has requested financial participation from the State Water Commission in an amount of $40,000 and it was his recommendation that the Commission participate in this amount.

It was moved by Commissioner Kramer, seconded by Commissioner Jungroth and carried, that the State Water Commission allocate the sum of $40,000 to assist in the construction of Indian Creek Dam.

REQUEST FROM PEMBINA COUNTY WATER MANAGEMENT DISTRICT FOR FINANCIAL PARTICIPATION FOR PEMBINA RIVER CHANNEL CHANGE (#1461)

Secretary Fahy stated that a request has been received from the Pembina County Water Management District for state financial aid to make a major channel realignment past the city of Walhalla for the purposes of protecting the city proper and the sewage lagoon while providing water for park use. Pursuant to recommendations made by the State Water Commission, plans are to enlarge the Pembina River channel at the point where it runs adjacent to the sewage lagoon and this material, river bottom silt and clay, will be used to cover the old dump grounds in compliance with

State Health Department regulations. The total estimated cost of the channel relocation project is $17,000, and the request to the State Water Commission for financial participation is for 40 percent of this amount, or $6,800. It was Secretary Fahy's recommendation that the Commission participate in this project in an amount not to exceed $6,800.

It was moved by Commissioner Gray, seconded by Commissioner Noteboom and carried, that the State Water Commission participate in the City of Walhalla project using channel cut for dump cover in an amount not to exceed $6,800, or 40 percent of the total estimated cost.

REQUEST FOR FINANCIAL PARTICIPATION IN IMPROVEMENT OF CASS COUNTY DRAIN NO. 21 (#1075)

Secretary Fahy indicated that a request has been received from the Cass County Drain Board for financial participation in a project to improve the outlet channel of Cass County Drain No. 21 by lowering the ditch bottom one foot and changing the side slopes from 3:1 to 4:1. Plans for the improvement project have been reviewed and meet State Water Commission criteria, therefore, it was his recommendation that the Commission participate financially in this project. The estimated qualified construction items amount is $60,450 and the estimated state share, deducting deferred maintenance, is $22,858.80.

It was moved by Commissioner Gray, seconded by Commissioner Jungroth and carried, that the State Water Commission participate in an amount not to exceed $22,858.80 for the improvement of Cass County Drain No. 21.

DISCUSSION ON WEATHER MODIFICATION PROJECT - APPEARANCE BY JAMES EASTGATE (#869)

Secretary Fahy introduced Mr. James Eastgate who made a presentation on the subject of weather modification in the State of North Dakota. Mr. Eastgate presented general background weather modification statements and suggestions for consideration by the State Water Commission, which statement is attached as Appendix "A" of these minutes.

Governor-Chairman Arthur A. Link arrived at the meeting.

Mr. Eastgate noted that North Dakota State University is initiating a state-wide information program on weather modification which will include what weather modification is, how it operates, what it has accomplished, what performance may be expected based on research to date, what it will cost, etc. He indicated that a number of organizations, both farm and business, have expressed active support for such a program.

Mr. Eastgate has made a presentation on the subject of weather modification to the Legislative Council's Natural Resources Committee "B" in which recommendations were made concerning the relationship of the State Water Commission and the Weather Modification Authorities.

Mr. Eastgate noted that he has had several contacts with Dr. Ray J. Davis of Arizona University to discuss weather modification legislation both nationally and internationally. Dr. Davis has acted as consultant for weather modification laws in several states, and through future contacts with him, specific recommendations on weather modification legislation will be prepared.

After a brief discussion and questioning of Mr. Eastgate's proposed project, it was moved by Commissioner Gray, seconded by Commissioner Kramer and carried, that the State Water Commission endorse the following suggestions made by Mr. James Eastgate: (1) a public statement by the State Water Commission recognizing the place of atmospheric water as a natural resource of the state; and (2) a public statement endorsing a public information program led by the North Dakota State University Extension Service and Experiment Station to inform the people of North Dakota what weather modification is, how it operates, what it has accomplished, what might be expected from it, what it will cost, and assuring Commission cooperation in such an information program. (See Appendix "A")

TRI-COUNTY WATER RESOURCES DEVELOPMENT ASSOCIATION
JAMES EASTGATE, BURLEIGH COUNTY WATER MANAGEMENT DISTRICT
(#412)

Mr. James Eastgate reported that during a recent meeting of the Apple Creek landowners, a legal entity named the Tri-County Water Resources Development Association was created to support Senate Bill No. 1896 introduced by Senators Burdick and Young authorizing a four-year feasibility study on approximately 60,000 acres of land in the lower Apple Creek watershed. A strong interest has been shown by landowners in the Long Lake area, a part of the Apple Creek drainage system, and its inclusion could add as many as 70,000 acres to the proposed irrigation district. Mr. Eastgate requested support of the State Water Commission in respect to the Bureau of Reclamation's feasibility study in the Apple Creek unit.

It was the general consensus of the Commission members that at future meetings, representatives from the various state water management districts be invited to report on their county's progress and problems.

WATER RESOURCE PROBLEMS RELATING TO UPPER GREAT PLAINS ENERGY DEVELOPMENT - PRESENTATION BY DR. DALE ANDERSON, WATER RESOURCES RESEARCH INSTITUTE, NORTH DAKOTA STATE UNIVERSITY (#322)

Secretary Fahy introduced Dr. Dale Anderson, who is the Director of the Water Resources Research Institute at North Dakota State University. Dr. Anderson distributed copies of a statement to the Commission members, entitled Water Resource Problems Relating to Upper Great Plains Energy Development, a research program being jointly planned and developed by the Water Institute Directors of Wyoming, Montana and North Dakota. This statement is attached hereto as Appendix "B".

Dr. Anderson briefly reviewed the project noting that its main objective is to develop a comprehensive study to systematically identify and measure the numerous hydrologic, social, legal, institutional, economic and environmental impacts associated with different coal development alternatives in the Upper Great Plains. Eleven major categories have been established under which 57 problem areas will be ranked on a priority basis. This will be initiated at a meeting to be held in Bismarck on September 28. Attendance at this meeting will include representatives from the North Dakota Congressional Delegation, the executive and legislative branches of State Government, heads of State agencies most closely associated with energy development problems, and representatives from the University of North Dakota and the North Dakota State University.

WATER PERMIT APPLICATION FROM UNITED POWER ASSOCIATION TO APPROPRIATE 15,000 ACRE-FEET OF WATER FROM MISSOURI RIVER

Secretary Fahy stated that an application for a water permit to divert 15,000 acre-feet of water from the Missouri River to construct two power generating plants by United Power Association in the Underwood, North Dakota, area has been received in the office of the State Water Commission. Mr. Tom Pearce representing United Power Association commented briefly on the proposal, stating that the two units would each consist of 450 megawatts for a 900-megawatt plant. Secretary Fahy indicated that a public hearing would be required on the application.

After discussion by Commission members, it was unanimously agreed that the date of October 29, 1973 at 2:00 P.M., be set for the public hearing on the application for a water permit by United Power Association.

WATER PERMITS

Secretary Fahy presented seven water permits to the Commission members for their consideration. He noted that the public hearing on water permit Nos. 1963 and 1964, Minnkota Power Cooperative, Inc., Grand Forks, will be held following the Commission meeting now in session, and therefore, Commission action on these two permits should be deferred until the hearing has been concluded. He also recommended that water permit No. 1958, Ralph N. Heinzen, Emmet, North Dakota, be deferred at this time pending further investigations. It was his recommendation that the other water permit requests be approved subject to conditions indicated on the permit.

It was moved by Commissioner Jungroth, seconded by Commissioner Kramer and carried, that the following water permit application requests be approved: No. 1946, Rott Farms, Jamestown; No. 1952, Alfred Foell, Moffit; No. 1945, City of Mohall, Mohall; No. 1950, James Staudinger, Richardton; No. 1962, Patrick Carroll, Moffit; and No. 1960, Johnny Buechler, Zap. Water Permit No. 1958, Ralph N. Heinzen, Emmet, is to be deferred at this time pending further investigations; and Water Permit Nos. 1963 and 1964, Minnkota Power Cooperative, Inc., Grand Forks, will be considered following conclusion of public hearing scheduled for this date. (See Appendix "C")

PROPOSED RULES AND REGULATIONS FOR NORTH DAKOTA STATE WATER COMMISSION

Secretary Fahy distributed copies of proposed State Water Commission rules and regulations to the Commission for its review. He suggested that a future meeting be devoted to discussing these rules and regulations.

The Commission recessed at 12:00 noon.

WATER PERMIT HEARING ON NOS. 1963 AND 1964, MINNKOTA POWER COOPERATIVE, INC.

The meeting was convened at 2:00 p.m., at which time Governor-Chairman Link opened the public hearing on water permit Nos. 1963 and 1964, Minnkota Power Cooperative, Inc., Grand Forks, North Dakota. The entire proceedings of the hearing were tape recorded for the record and will be available at a later date.

At the conclusion of the joint water permit hearings, it was unanimously agreed that the record be left open for a period of 20 days to allow time for the submission of additional testimony.

After a brief discussion by the Commission members, it was moved by Commissioner Gallagher, seconded by Commissioner Jungroth and carried, that in order for the Commission to study in more detail the testimony of the hearing and and in view of the 20-day period in which to receive written testimony, that the State Water Commission approve only the request of Minnkota Power Cooperative, Inc., relative to increasing the height of the dam. This approval does not constitute authority for the impoundment of additional water.

VERNON COOPER, MANAGER
GARRISON DIVERSION
CONSERVANCY DISTRICT -
RESOLUTION NO. 73-9-353

It was moved by Commissioner Kramer, seconded by Commissioner Gray and carried, that the State Water Commission adopt Resolution No. 73-9-353, Vernon Cooper, In Appreciation, commending Vernon Cooper, Manager, of the Garrison Diversion Conservancy District, on accomplishment of his duties as Manager of the Garrison Diversion Conservancy District and expressing the Commission's best wishes for a successful future. (See Appendix "D")

There being no further business to come before the Commission, the session was adjourned at 3:35 p.m.

Vernon Fahy
Secretary

ATTEST:

Arthur A. Link
Governor-Chairman

Burleigh County Water Management District

615 Kirkwood Plaza • Bismarck, North Dakota 58501

September 27, 1973

Presentation to the North Dakota State Water Commission on the subject of

WEATHER MODIFICATION

General background statements:

1. Water is essential for all forms of life.

2. Atmospheric water is an integral component of the hydrologic cycle.

3. An adequate supply of water is the most critical single factor in the economic, social, cultural and environmental welfare of the people of North Dakota.

4. Regulation of water is a function of state government under the constitution and laws of North Dakota.

   a. The State Water Commission has, and is, regulating surface and ground waters. (Chapter 61 NDCC).

   b. The State Aeronautics Commission represents the State in regulating weather modification activities. (Chapter 2-07).

5. Weather modification activities, to be most efficient, must be on a multi-county district basis (at least 3½ million acres and better 6½ million acres).

6. Governmental regulation of any resource attains its greatest efficiency and service to its people only when such regulation is handled by one agency. Fragmentation of regulation among several agencies encourages inefficiency in a geometrical progression.

7. Weather modification (cloud seeding) for suppression of hail and augmentation of precipitation in the Northern High Plains has been practiced to some degree for twenty years. Research and operations to date in this area have established a very favorable benefit:cost ratio for weather modification activities. (Bowman, Slope, Adams and Hettinger counties 13 years continuous operation. McKenzie, Mountrail and Ward Counties up to 5 years).

8. General public information about weather modification in North Dakota has been meager, if not totally nonexistent, until this past summer. (NDSU is initiating a statewide information program at the urging of the Stockmen's Association, Wheat Commission, Water Users, Water Management Districts Association, Lewis & Clark RC&D. Resolutions supporting the information program are before the Burleigh County Farm Bureau and Farmers Union for consideration at their October conventions).

9. A presentation on the subject of weather modification was made to the Legislative Council Natural Resources Committee "B". (See attached letter).

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Suggestions for consideration by the State Water Commission:

1. A public statement by the Commission recognizing the place of atmospheric water as a natural resource of the state.

2. A public statement endorsing a public information program led by the NDSU Extension Service and Experiment Station to inform the people of North Dakota what weather modification is, how it operates, what it has accomplished, what might be expected from it, what it will cost, etc., and assuring Commission co-operation in such an information program.

Probably about May or June next year it is suggested the Commission review proposed legislation prior to its presentation to the Legislative Council Natural Resources Committee "B", chaired by Rep. Richard Hentges, which is the committee designated to study environmental laws, and make recommendations to that committee.

Inasmuch as a statement on weather modification was filed with the Legislative Council "A", chaired by Sen. Lee Christensen last June, which is charged with the study of land use planning among other topics such as gravel pit reclamation, it may be desirable to expand activities to include this committee.

At this time some thoughts for consideration in the field of legislation to be recommended include:

1. Repeal of Chapter 2-07 and incorporation of most desirable portions in Chapter 61.

2. Director of Aeronautics Commission to be aviation advisor to State Water Commission. (Establishment of equipment criteria and operations).

3. State Water Commission to employ competent, experienced meteorlogist-engineer to direct the weather modification division.

4. State to establish criteria, award contracts and supervise operations. Counties participating on a voluntary basis.

5. County cooperation through Water Management Districts (to be 5-man board with the 2-mill weather mod. levy earmarked).

6. State-County participation on 50-50 basis. (S.D. is 3 State-1County). (estimated state cost first bi-ennium about $500,000 to $600,000.)

Respectfully submitted

Jim Eastgate

Jim Eastgate

APPENDIX "A"

Burleigh County Water Management District

615 Kirkwood Plaza • Bismarck, North Dakota 58501

September 21, 1973

Mr. Jack McDonald, Counsel
Legislative Council
Natural Resources Committee "I"
State Capitol
Bismarck, North Dakota 58501

Dear Jack:

In connection with your letter of August 31st addressed to Mr. Vern Fahy, State Water Commission and me asking for recommendations concerning the relationship of the State Water Commission and Weather Modification Authorities the following statements are submitted for consideration of the committee:

1. Atmospheric water is essential in the hydrologic cycle and probably has more effect on both surface and ground water supplies than the other way around.

2. State regulation of all water resources should be within a single agency for the most efficient and beneficial performance. The North Dakota State Water Commission has, and is, doing an outstanding job in the surface and ground water fields.

3. Addition of a meteorologist-engineer to the staff of the State Water Commission to supervise Weather Modification programs and correlate with other water management activities would do the best job. The Director of the State Aeronautics Commission should be designated as the aviation advisor to the State Water Commission.

4. Because efficient operation of a weather modification program requires multi-county units (on a voluntary basis) it is only with an active knowledgeable state program cooperating with the counties that the greatest benefits can be achieved.

5. The NDSU Experiment Station and Extension Service are just getting underway with a statewide information program about weather modification that will include: what weather modification is, what and how does it operate, what has it accomplished, what may be expected performance based on research to date, what will it cost, etc. Other organizations, both farm and business, have indicated active support for such an information program.

5. A personal recommendation is that consideration be given to legislation providing County Water Management Districts have the authority to enter into agreements with the state for weather modification programs in their counties. This would combine all

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County Water Management Board of three to five members appointed by the County Commissioners and a separate Weather Modification Authority of five members designated by petition or the County Commission.

6. I would respectfully suggest deferring detailed recommendations for legislation until about June 1, 1974 by which time the statewide information program of NDSU will hopefully have produced more knowledge on the subject among the electorate.

It has been my privilege to discuss weather modification legislation on two occasions with Dr. Ray J. Davis of Arizona University Law School, probably the most knowledgeable legal authority on the subject both nationally and internationally. He has acted as consultant on weather modification laws in several states, most recently in Illinois. It is my intention to continue and expand my contacts with Dr. Davis in order to be able to make the best, soundest and most beneficial specific recommendations on legislation that can do the most for North Dakota.

Mr. Fahy will comment on this letter when he writes you with his recommendations.

Respectfully yours,

Jim Eastgate

Jim Eastgate

cc: Vern Fahy
State Water Commission

Rep. Richard Hentges
Committee Chairman

APPENDIX "B"

Water Resource Problems Related to Upper Great Plains Energy Development[1]

by

Dale O. Anderson, Director
Water Resources Research Institute
North Dakota State University

BACKGROUND

One of the greatest, if not the greatest, challenges facing North Dakota in the next decade is to provide an acceptable level of natural resource development and economic and social well-being within a quality environment. We can achieve this goal through adequate comprehensive planning. Such planning assumes a fundamental knowledge of biological, physical, social, and economic know-how necessary to achieve a political solution. The Water Institutes of Montana, Wyoming and North Dakota, observing gaps in this knowledge base, initiated plans to systematically identify additional information that would be needed by decision makers in establishing rational decisions regarding the development and use of our natural resources for energy development.

THE RESEARCH PROGRAM

The joint discussion held between the Water Institute Directors of Wyoming, Montana and North Dakota, led to the development of a research project entitled "Water Resource Problems Related to Upper Great Plains Energy Development." This project is being funded by the Office of Water Resources Research, U. S. Department of the Interior under Title 1, Section 101 of Public Law 88-379. The objective of the project is to develop a comprehensive study to systematically identify and measure the numerous hydrologic, social, legal, institutional, economic and environmental impacts associated with different coal development alternatives in the Upper Great Plains. The Wyoming Water Resources Research Institute is the lead agency on this project. The Directors of the three State Water Institutes form the project management team. The Directors have contracted with Dr. Jack Davidson to provide the leadership in carrying out the objectives of the project. The project is designed to accomplish the following sub-objectives:

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[1]A research program being jointly planned and developed by the Water Institute Directors of Wyoming, Montana and North Dakota. Progress report presented to North Dakota State Water Commission on September 27, 1973.

1. A thorough identification of problem areas associated with the development of energy from the natural resources of the three-state area.
2. A complete review and documentation of research in progress which relates to the problem area.
3. An identification and analysis of additional areas requiring research.
4. Establish priorities on problem areas.
5. A commitment of faculty resources available within the three-state region interested in participating in this user-oriented research program.
6. Develop a financial plan necessary to implement the needed research.

We have endeavored to develop and maintain close coordination and cooperation with appropriate state and federal agencies including the Northern Great Plains Resource Program and Project SEAM, individuals and private firms during the development of the first three phases of this research project. We have held informational meetings at UND and NDSU to acquaint the faculties with the magnitude of the problem and to solicit their participation in a research program that will provide results adding to the knowledge base necessary in forming rational decisions relative to the development of coal and water in North Dakota and the tri-state region. At these meetings we have asked the faculty interested in continuing to pursue research in this area to provide us with the following information:

1. Specific problem areas in which they were interested in conducting research.
2. Research objectives.
3. Research outline of the procedure.
4. Usefulness and application of the results.
5. Expected time requirement.
6. The amount of time available by the staff member.
7. Expected budget requirements necessary to carry out the research. We have received approximately two dozen replies to this initial request.

The problem identification phase of this study has been quite extensive. Within the state, discussions have been held with:

1. Willis Van Heuvelen, State Health Department
2. Vernon Fahy and Delton Schulz, State Water Commission
3. Bruce Hagen and Richard Elkin, Public Service Commission
4. Jack Neckels, State Planning Division
5. Charles Koch, Bureau of Mines, Bismarck
6. Jack Bond and other staff members, Northern Great Plains Research Center, Mandan
7. Russ Dushinski, North Dakota Water Users Association
8. Steering Committee, West River Diversion Advisory Committee
9. Ike Ellison, U. S. Forest Service, Dickinson

In addition, contacts have been made with the Bureau of Reclamation, EPA and other federal agencies at both the regional and Washington level.

One result of our efforts to date has been the identification of 57 problem areas within 11 major categories. The 11 major categories are:

1. Trace Elements
2. Air Resources
3. Coal Resources and Mining Techniques
4. Surface Resource Problems
5. Reclamation Problems Associated with Surface Resources
6. Water Resources
7. Water Quality
8. Regional Economic Development
9. Social, Economic and Community Development
10. General Economic and Institutional Research Needs
11. General Technology Development

The 57 problem areas are associated with the 11 major categories identified above. A list of the 57 study needs within the 11 major categories is attached to this progress report.

We must now establish priority ranking on this array of problems. This priority ranking will be accomplished through a meeting scheduled in Bismarck on Friday, September 28. Attendance at this meeting will include representation from our congressional delegation, representation from the executive and legislative branches of state government, representation from heads of state agencies most closely associated with energy development problems, and representation from UND and NDSU.

WHERE TO FROM HERE

The final report on this project will focus on the sub-objectives identified in the early part of this status report. In carrying out our analysis of the priority problem areas, our final report will include: (1) An identification of those problem areas in which research is presently in progress, and additional research beyond that presently in progress appears unnecessary; (2) An identification of problem areas in which research is presently in progress, but funded at an inadequate level. The allocation of additional research resources into this area would be recommended; and (3) An identification of those problem areas in which research is not presently in progress but information resulting from research is urgently needed. This area would be singled out for funding.

Once the final report has been completed, the next step will be

the actual development of the financial resources necessary to implement various research projects. Although we have received encouraging reaction from Department of the Interior officials, we are uncertain as to the source or sources of funding at this time. We do expect our "vision of funding" to be much clearer within the next month.

PRELIMINARY LIST OF STUDY NEEDS IDENTIFIED THROUGH MATCHING GRANT PROJECT B-024-WYO, "WATER RESOURCE PROBLEMS RELATED TO UPPER GREAT PLAINS ENERGY DEVELOPMENT."[1]

PREPARED BY

DR. JACK DAVIDSON, STUDY COORDINATOR AND WATER INSTITUTE DIRECTORS OF MONTANA, WYOMING AND NORTH DAKOTA.

A. TRACE ELEMENTS

1. Conduct baseline studies of the trace element composition of plants, soils, water, and rocks in major coal areas of the Region.

2. Develop an acceptable methodology for sampling and analysis of trace elements in coals and associated overburden and determine trace elements in major strippable coal deposits of the region.

3. Determine trace elements and inorganics in coal ash and other by-products of regional coal combustion and conversion to serve as basic data for determining the atmospheric mobilization of these factors and for examining the problems associated with mine and conversion plant waste disposal.

B. AIR

1. Design system(s) and specify data requirements to permit air quality management commensurate with environmental standards for the region.

2. Delineate major airsheds in the region. Collect, review and evaluate existing meteorological, climatological and air quality data. Identify additional data needed for air quality management, e.g. airshed dynamics, air quality and visibility baselines, aerosol levels, etc.

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[1] A research program being jointly planned and developed by the Water Institute Directors of Wyoming, Montana and North Dakota.

B. AIR (Cont.)

3. Monitor smoke stack emission of current coal combustion operations to determine atmospheric mobilization of trace elements and inorganics and the impact on air quality, visibility, aerosol levels, etc.

4. Use of diffusion modeling to estimate atmospheric effects and areas of possible deleterious impact on surface resources of different types and levels of coal resource development in the region.

C. COAL RESOURCES AND MINING TECHNIQUES

1. Identify major deposits of strippable coal, together with estimates of the quantities which can be mined economically, given present technology and environmental standards.

2. Appraise current strip-mining techniques and technologies to determine efficient and effective systems with respect to economics of mining operations, percent recoverage of coal in single and multiple seam beds, environment damage control.

3. Examine problems of disposal of wastes from coal conversion for power generation and gasification. Devise and design methods and techniques to minimize impacts of toxic materials on surface and subsurface ecosystems.

D. SURFACE RESOURCES

1. Survey, identify and evaluate unique geologic, archeologic, historic, wildlife and other ecological, recreational, and aesthetically valuable resources of the region. Identify areas and situations where strip-mining coal conversion, energy transport systems, etc., will threaten these resources. Recommend measures to protect or otherwise preserve resource values.

2. Identify present land use and land use alternatives for areas most likely to be significantly impacted by coal-industry development. Should include consideration of post-mining adjustments and uses of resources.

3. Use interpretive analysis of available geological information to show the effects of mining of major strippable deposits on topography and streamflow for areas of expected concentration of strip-mining activities.

D. SURFACE RESOURCES (Cont.)

4. Specify data requirements necessary to establish necessary baselines and to monitor the effects of coal development on biological ecosystems and other surface resources. Design needed biological and precipitation chemistry monitoring systems.

5. Study selected areas subject to emission from current coal combustion plants to determine the effects of precipitation of coal combustions by-products on communities, vegetation, animals and other surface resources.

E. SURFACE RESOURCES (RECLAMATION)

1. Establish methods and procedures for determining how mining and reclamation fit into the long-range resource development objectives for an area. Includes assessment of premining use and values, the range of uses or options available for reclamation and determining economic and social benefits and costs of options.

2. Review applicable work to date on mine site reclamations. Develop methods, techniques and guidelines for mining and handling spoil bank materials to meet reclamation objectives, i.e., configuration, compacting, restoration of topsoil, mixing, etc.

3. Develop procedures for setting up soil, water or vegetation management programs required to achieve reclamation goals.

4. Determine combinations of plants required to meet specific reclamation needs (uses) in specific areas - this includes consideration of the role and interactions of native vs. introduced species.

5. Develop methods for collection, handling, storage, propagation of seeds of indigenous plants and successful cultivation of these species.

6. Develop a clearinghouse for finding on mine site revegetation research.

F. WATER RESOURCES

1. To continue to develop and adapt computerized water planning model(s) as a tool to assess impact of changes in water requirements (industrial development) in the region and meet regional planning needs.

F. WATER RESOURCES (Cont.)

2. Survey existing water data to determine the amounts of water available in the region, identify present uses and options on use, develop additional monitoring systems required to determine quantities of water potentially available to meet alternative needs (including industrial development).

3. Determine water requirements for different levels and types of coal-energy industry development in the region; examine the options to meet these requirements, i.e. further development of surface and groundwater supplies, interbasin and interstate transfers. Determine the legal implications and ecological, social and economic impacts of these options.

4. Survey and inventory quantities and quality of groundwater resources, e.g. carbonate (limestone) aquifers to determine supplies available for industrial development and supporting uses, safe yield, recharge of aquifers and effects of groundwater use on nearby surface supplies.

5. Determine instream values of fisheries, water recreation and aesthetic uses for streams and rivers subject to water withdrawals, return flows and otherwise affected by industrial development in the region; predict the changes in these values to be expected from various types and levels of industry and water development.

6. Determine areas where strip-mining is likely to interrupt the flow lines for wells producing water for livestock and other purposes. Determine the number of wells likely to be affected and the alternatives for supplying water to these users.

7. Examine the possibilities for use of water systems to meet alternative levels of coal-industry development in the region to serve other resource development options and post-development and post-mining needs.

8. Estimate present recreation use and use potential of present streams and impoundments in the region. Estimate changes in demand for waterbased outdoor recreation to be expected with alternative types and levels of development in the region. To project changes in recreation values to be expected from changes in water storage and delivery systems which have been proposed to meet water requirements for development.

G. WATER QUALITY

1. Determine water quality requirements for expected industrial uses and to meet water quality standards of the region. To collect, review and evaluate existing water quality data, surface and groundwater, to determine its adequacy for quality assessment, establishment of baselines and effective water quality management. Specify additional data needs and develop methods and procedures for acquisition and analysis.

2. Chart and analyze surface and subsurface hydrology in the proximity of major development sites. Determine effects and expected effects of mining and mine-mouth coal conversion on surface and groundwater hydrology and toxicity in the affected areas.

3. Determine impacts on quality of surface and groundwaters through surface runoff and percolation, of mining and coal conversion spoils, combustion products and trace elements, etc.

4. Determine effects of strip-mining on quality of water and recharge in adjacent aquifers, through destruction of coal bed aquifers, filling of final cut, percolation of water soluble organic compounds from coals and spoil bank materials. Estimate effects of these changes on nearby water users.

5. Study long-term implications of power and coal conversion generation on the salinity of the Yellowstone-Missouri River Systems. Project the effects on downstream users and use values and on in-stream values.

H. REGIONAL ECONOMIC DEVELOPMENT

1. Identification of regional development alternatives: to include types and levels of coal/energy industry development expected, given national and regional energy demand projections, available technology and institution constraints.

2. Identify and assess economic factors capable of complimenting or restraining development of coal/energy industry in the region, i.e., location of major deposits, water availability and costs, logistic base, distance from major supply centers and markets, communications, climate, local and state institutions, etc.

H. REGIONAL ECONOMIC DEVELOPMENT (Cont.)

3. Given major development alternatives and present economic structure of the region, project the economic impact of these development alternatives on the region, including institutions, state and local government finances and income distribution.

4. Given major economically strippable coal deposits identify, inventory, and assess the major economic and social factors and constraints affecting locations, type and level of coal development in the Fort Union Basin. These include availability of labors, water availability, logistic base supporting service availability, legal restrictions, etc. Determine alternative levels and types of coal/energy development levels likely to occur.

5. Examine and evaluate economic and ecological impact of proposed systems of energy transfer including new energy corridors, ingrading of the capacity of existing corridors, multiple use of transmission corridors and the establishment of national or regional grid systems.

6. Determine the transportation requirements for alternative types and levels of coal/energy development in areas where coal resources are concentrated. Evaluate the capacity of the present transportation resources to provide needed services. Define transportation systems, (modes and combinations of modes) to best service alternative development scenarios. Estimate capital requirements, ecological impact and social costs and benefits of these systems.

I. SOCIO-ECONOMIC AND COMMUNITY DEVELOPMENT

1. Given development alternatives, project changes in regional employment patterns, types and number of jobs, role of indigenous population in meeting employment needs, the expected population influx, the social characteristics of immigrant populations.

2. Given development alternatives and associated population projections develop models for projecting impacts upon life style of immigrants and indigenous population.

3. For given development alternatives investigate the potential impact on critical social institutions and the influence of existing institutions on the

I. SOCIO-ECONOMIC AND COMMUNITY DEVELOPMENT (Cont.)

3. structure of development. Determine the probable demands to be placed upon institutions and their ability to meet these demands.

4. Assess the impacts of different development alternatives upon community identity and integration and interaction within and between recognizable community groups, family structure and stability, life-style options of individuals and the individual's preception of his social role.

5. Investigate the potential impact of development alternatives upon existing social processes in the development area, interactions between individuals, groups, communities, structures, social movements, crisis, etc.

6. Project public service requirements for different levels and types of development. Appraise the capacity of present units of state and local government to provide these services.

7. To develop community planning models capable of testing the ability of various community configurations to provide required economic and social services and at the same time meet desirable objectives for quality of life during development, post-development and post-mining eras.

8. Study the effects of resource and energy development on Indian welfare, economic, social and religious patterns.

J. GENERAL ECONOMIC AND INSTITUTIONAL RESEARCH NEEDS

1. Inventory existing water-rights including Indian Water-Rights. Determination of the general legal status of these rights, e.g. commitment to specific use, ability to sell, or otherwise transfer water to different uses in the region or to other states.

2. Examine and evaluate the performance of national, state and local institutions charged with the administration of mineral development in the region. Suggest institutional changes needed to guarantee mineral development compatible with goals for long-range land use planning and maintenance of quality of life.

J. GENERAL ECONOMIC AND INSTITUTIONAL RESEARCH NEEDS (Cont.)

3. Review applicable statuatory framework and contractual and regulatory procedures of relevant state and government agencies to determine their adequacy for coping with problems likely to be generated by large-scale mining and coal conversion developments in the region; suggest alternative procedures as needed to minimize undesirable impacts of developments.

4. Determine criteria for leasing of mineral rights for lands under jurisdication and develop a long-range program for leasing western coal lands compatible with long-range land use and social objectives.

5. Determine the amount of leasing, including prospecting permits which have taken place in the region to date together with the applications of file. Determine the effects of these present leasing policies on the structure of development in the area together with implications for future development. Estimate the effects of alternative leasing policies in meeting state and national objectives for development.

K. GENERAL TECHNOLOGY DEVELOPMENT - OTHER

1. Studies of conservation of energy through improvement of efficiency in generation, transportation and utilization.

2. Improved technology for reduction of waste heat and conservation of water in power generation systems.

3. Improved stack emission control technology particularly to handle troublesome or potentially troublesome trace components.

4. Determine water requirements, including quality, for alternative coal conversion technologies (e.g., dry vs. wet cooling) and to examine the costs and benefits of water conserving technology vs. water development or transfer from other areas and/or uses.

WATER PERMITS FOR SEPTEMBER 27, 1973 AGENDA

NO.	NAME AND ADDRESS	SOURCE	PURPOSE	AMOUNT REQUESTED	COMMENTS & RECOMMENDATIONS
1946	Rott Farms - Jamestown (Stutsman County)	Ground Water	Irrigation	450.0 acre-feet 408.0 acres	450.0 acre-feet 408.0 acres
1952	Foell, Alfred - Moffit (Emmons County)	Ground Water	Irrigation	360.0 acre-feet 240.0 acres	360.0 acre-feet 240.0 acres
1945	Mohall, City of - Mohall (Bottineau County)	Ground Water	Municipal	150.0 acre-feet	150.0 acre-feet
1958	Heinzen, Ralph N. - Emmet (McLean County)	Ground Water	Irrigation	240.0 acre-feet 156.0 acres	Defer pending further investigation
1950	Staudinger, James - Richardton (Dunn County)	Unnamed Intermittent Draws and Knife River, trib. to Knife and Missouri Rivers	Irrigation - Waterspreading	391.0 acre-feet 195.5 acres	195.5 acre-feet 195.5 acres
1962	Carroll, Patrick - Moffit (Burleigh County)	Ground Water	Irrigation	501.6 acre-feet 334.4 acres	501.6 acre-feet 334.4 acres

NO.	NAME AND ADDRESS	SOURCE	PURPOSE	AMOUNT REQUESTED	COMMENTS & RECOMMENDATIONS
1960	Buechler, Johnny - Zap (Mercer County)	Unnamed Intermittent Draw, trib. to Knife River	Irrigation - Waterspreading	51.9 acre-feet 51.9 acres	51.9 acre-feet 51.9 acres
1963	Minnkota Power Cooperative, Inc. - Grand Forks (Oliver County)	Nelson Lake on Square Butte Creek, trib. to Missouri River	Industrial	5000.0 acre-feet storage 2480.0 acre-feet annual use	To be considered at September 27, 1973 SWC Meeting
1964	Minnkota Power Cooperative, Inc. - Grand Forks (Oliver County)	Missouri River	Industrial	26,000.0 acre-feet	To be considered at September 27, 1973 SWC Meeting

APPENDIX "D"

RESOLUTION 73-9-353

In Appreciation
Vernon S. Cooper

WHEREAS, Mr. Vernon S. Cooper served faithfully, diligently and with distinction on the staff of the North Dakota State Water Commission from 1948 to 1955; and

WHEREAS, Mr. Cooper was appointed Secretary-Manager of the Garrison Diversion Conservancy District when the District was established in July, 1955, and through his wise counsel and devoted efforts in the ensuing years has aided immeasurably in forwarding the Garrison Diversion Unit well into the construction stage; and

WHEREAS, the State Water Commission has enjoyed excellent cooperation from Mr. Cooper and the Garrison Diversion Conservancy District Board of Directors.

NOW, THEREFORE, BE IT RESOLVED by the North Dakota State Water Commission in regular session at Bismarck, North Dakota, this 27th day of September, 1973, that it does gratefully commend Mr. Cooper for his diligent service and many contributions to the wise utilization of North Dakota's water resources and, further, does wish him a happy and successful career in his new position with the Bureau of Reclamation at Washington, D. C.

FOR THE NORTH DAKOTA STATE WATER COMMISSION:

SEAL

Arthur A. Link
Governor-Chairman

ATTEST:

Vernon Fahy
Secretary