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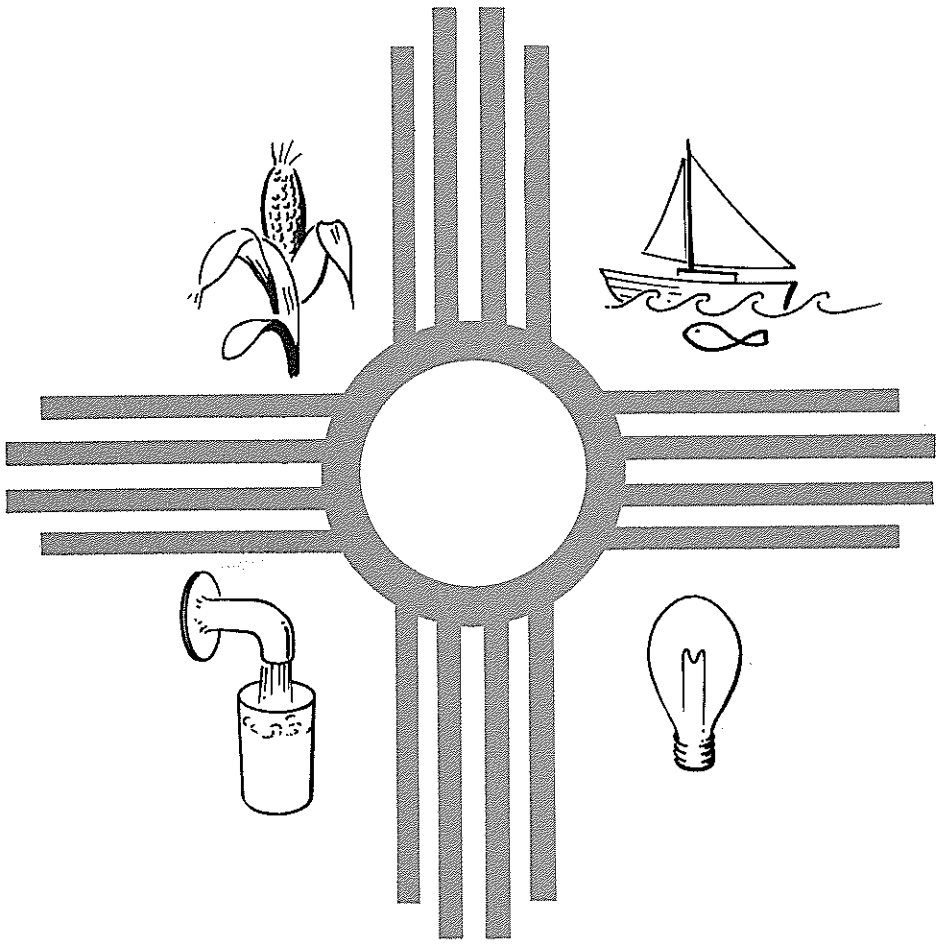
WRRI Report No. 101

PROCEEDINGS OF THE TWENTY-THIRD ANNUAL NEW MEXICO WATER CONFERENCE

New Mexico's Water Resources: Considering the Possible

April 27-28, 1978



New Mexico Water Resources Research Institute

New Mexico State University ● Telephone (505) 646-4337 ● Box 3167, Las Cruces, New Mexico 88003

"NEW MEXICO'S WATER RESOURCES: CONSIDERING THE POSSIBLE"

PROCEEDINGS OF THE

TWENTY-THIRD ANNUAL NEW MEXICO WATER CONFERENCE

NEW MEXICO STATE UNIVERSITY

LAS CRUCES, NEW MEXICO

APRIL 27-28, 1978

PREFACE

This year marks the twenty-third consecutive New Mexico Water Conference. In contrast to earlier years, this year's conference was structured around a workshop format. This was done to encourage audience participation in a small group atmosphere. Keynote speakers and discussion leaders were selected to provide direction to the meetings. Conclusions reached in the individual workshops were brought before the group in a final plenary session and the conference was concluded by a lively discussion among members of a distinguished panel of water experts.

The papers included in this year's "Proceedings" are edited versions of formal presentations and workshop conclusions. The highlight of this year's "Proceedings" is an edited transcription of the entire panel discussion.

As a preview to this document the following are representative quotations that were heard during the Conference:

"There is not enough water (in New Mexico) to meet all of the projected requirements of the state."

"We will need a 10 fold increase in returns from agriculture in order to compete financially with other industries and urban use of water."

"We are not likely to conserve ourselves into a rich water supply."

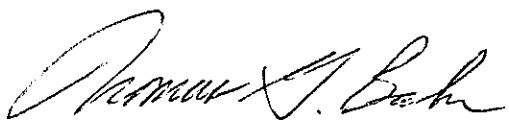
"We need to get the priority of saline water development off the back burner."

"Water and energy are inseparable. The limited supply of water in New Mexico may be the basis, the measure and the bottom limit to problems associated with water use for energy production."

"New Mexico has operated to the satisfaction of its citizens without any National Water Policy."

"Expertise simply does not exist at the Federal level that could do a better job of managing water than the states are already doing."

The success of this year's conference was a direct consequence of the serious concern and constructive attitude on the part of all participants in considering the possible as it related to our most valuable natural resource, water.



Thomas G. Bahr
Director

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For providing the munchies for our Social Hour, we'd like to give special thanks to:

Troy Grimes, Cisco Ford Equipment Company
1400 Avenida de Mesilla, Las Cruces

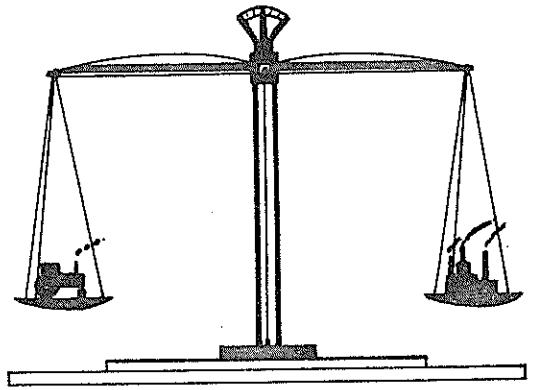
C. B. "Chuck" Romney, Romney Equipment Company
1305 S. Valley Drive, Las Cruces

Jesse Gilmer, Tri-State Equipment
1501 E. Paisano, El Paso

THE 23RD ANNUAL NEW MEXICO WATER CONFERENCE

APRIL 27-28, 1978

"CONSIDERING THE POSSIBLE!"



Carbine Auditorium
Anderson Hall
(Physical Science Laboratory)

New Mexico State University, Las Cruces Campus

Thursday Morning - April 27, 1978

8:00 - 9:00 REGISTRATION

Stucky Hall
Water Resources Research Institute

FIRST SESSION

NEW MEXICO'S WATER RESOURCES--
AN OVERVIEW

9:00 - 9:15 HERDING TIME

9:15 - 9:20 ANNOUNCEMENTS

9:20 - 9:30 WELCOME TO THE UNIVERSITY

Dr. Harold Daw
Associate Academic Vice President at NMSU

9:30 - 10:15 AN ASSESSMENT OF NEW MEXICO'S WATER RESOURCES

Mr. Darrell Mach, Regional Planning Officer
Southwest Region - Bureau of Reclamation

10:15 - 10:50 WATER BREAK

10:50 - 11:00 THE WORKSHOP FORMAT - HOW, WHY, WHEN, AND WHERE

THE MENU

11:00 - 11:10 Water and Agriculture

Dean L. S. Pope
College of Agriculture, NMSU

11:10 - 11:20 Saline Water - Revisited

Mr. Frank DiLuzio
Los Alamos Scientific Laboratory

11:20 - 11:30 Energy and Water

Mr. William "Bill" Lorang
El Paso Natural Gas Company

11:30 - 11:40 National Water Policy

Mr. Jesse Gilmer
Rio Grande Compact Commission

11:40 - 11:50 Water Rights

Mr. D. E. Gray
Water Rights Division, State Engineer's Office

12:00 - 1:30 LUNCHEON - Corbett Center, NMSU

Session Chairperson
Dr. Sam Maggard
Head, Civil Engineering Department

Speaker: Dr. Thomas G. Bahr
Director, WRRI

SECOND SESSION

2:00 - 4:30 WORKSHOPS AT CORBETT CENTER

2:00 - 4:30 Water and Agriculture

Reporter - Mr. Bobby J. Creel
New Mexico State University

2:00 - 4:30 Saline Water - Revisited

Reporter - Dr. Donald Brandvold
New Mexico Institute of Mines and Technology

2:00 - 4:30 Energy and Water

Reporter - Ms. Lynn Brandvold
New Mexico Bureau of Mines and Mineral Resources

2:00 - 4:30 National Water Policy

Reporter - Mr. Douglas Clark
University of New Mexico

2:00 - 4:30 Water Rights

Reporter - Ms. Kathleen Hain
New Mexico State University

AT EACH WORKSHOP -- 2:00 - 2:15 Statement of problem and workshop objectives

2:15 - 4:00 General discussion, debating, and hasseling

4:00 - 4:30 Preparation of workshop report

THIRD SESSION

6:00 - 8:00 SOCIAL HOUR - NO HOST

The Mission Inn
1765 S. Main Street

Friday Morning, April 28, 1978

FOURTH SESSION

9:00 - 12:00 FROM WORKSHOP DELIBERATION TO POLICY OFFICIALS

Session Chairperson
Mr. Jack Coats, Bureau Chief
Albuquerque Journal, Las Cruces

PANEL OF POLICY OFFICIALS

Mr. Gary D. Cobb, Director
Office of Water Research and Technology
U. S. Department of the Interior

Mr. Larry Morgan
Administrative Aide to Congressman Runnels
U. S. House of Representatives

Mr. Aubrey Dunn
New Mexico Senate
Otero County

Mr. Von Rue Crawford
New Mexico House of Representatives
Luna and Hidalgo Counties

Mr. Steve Reynolds
New Mexico State Engineer

9:00 - 9:10 GROUND RULES FOR THIS SESSION

Jack Coats

WATER AND AGRICULTURE

9:10 - 9:20 Report from Dean L. S. "Bill" Pope

9:20 - 9:40 Response from Panel and Discussion from the Floor

SALINE WATER - REVISITED

9:40 - 9:50 Report from Mr. Frank DiLuzio

9:50 - 10:10 Response from Panel and Discussion from the Floor

10:10 - 10:40 WATER BREAK

ENERGY AND WATER

10:40 - 10:50 Report from Mr. Bill Lorang

10:50 - 11:10 Response from Panel and Discussion from the Floor

NATIONAL WATER POLICY

11:00 - 11:20 Report from Mr. Jesse Gilmer

11:20 - 11:40 Response from Panel and Discussion from the Floor

WATER RIGHTS

11:40 - 11:50 Report from Mr. D. E. Gray

11:50 - 12:10 Response from Panel and Discussion from the Floor

12:15 ADJOURN

There is a $12.00 registration fee which includes luncheon and a copy of the proceedings.

This is a Public Conference. Everyone interested is welcome and encouraged to attend.

CONTENTS

WELCOME TO THE UNIVERSITY

DR. HAROLD DAW
Associate Academic Vice-President
New Mexico State University

It is a pleasure for me to be here with you and to welcome you to this 23rd Annual New Mexico Water Conference. I would like also to welcome the distinguished speakers and participants here to this conference. The conference has been running one year less than I have been with New Mexico State University. I hadn't realized that this conference had been held so many times. It is nice to see Dr. Stucky in the audience, he was the first Director of the Water Resources Research Institute. I'd like to also acknowledge the fine leadership of Professor Clark who succeeded him and we appreciate the service rendered this past year by Dr. Garrey Carruthers. We are now looking forward to working with Dr. Thomas Bahr who you will hear from as the program continues.

The Water Resources Research Institute is located here on campus at New Mexico State University, but it functions statewide with all aspects of the water community. We count this activity an important part of our mission and so we work hard to see that we do not neglect any of the areas in the state.

We have moved through a number of ages in the past. I don't know all of them, but we started with the Stone Age and moved through the Bronze Age, the Iron Age and some others. You can fill in the blanks. Each one of these in a sense has occurred at a time in which there was new expansion, new things, new futures opening up. Whenever there is a change coming in, preceding new categories of plenty, there appears to be an age of scarcity. We are now in this time of scarcity in a number of areas. We see this in relation to energy. We are concerned very much about whether we will have fuel to burn and if we do, can we burn anything or use anything because of pollution effect? We are concerned about the scarcity of water. And I think that's a part of the natural transition. I happen to be optimistic about the future. I don't believe that we're going to be faced with problems of serious consequence in the long run. But we should find a solution to those problems--at the moment, with shortages. Of course, in this area where water is already short, further shortages can become really disastrous.

I read the other day in the paper about someone with a solution to the water problems in Lebanon which did not happen to be an iceberg towed from the Antarctic, but rather water tankers. Some Canadians are negotiating to use water tankers to haul water from the west coast of Canada to Lebanon. It is interesting to think that maybe we will get a whole new economy in water in this way. I wonder if we could get ships from a Gulf of Mexico river, one that has lots of water, and sail them up the Rio Grande. Mark Twain once said, "I never realized what beauty water added to a river until I saw the Rio Grande."

President Thomas, I'm sure, would have liked to have been here to welcome you. He is in Taiwan and is therefore not available. He also missed the accreditation visit by the North Central Accrediting Association. This team finished yesterday. They were most laudatory of President Thomas and NMSU and work going on here.

I am optimistic about the future. We will pay the price. I trust you will have a great water conference and look deeply into the water problems in New Mexico.

AN ASSESSMENT OF NEW MEXICO WATER RESOURCES

MR. DARRELL MACH
Bureau of Reclamation
Amarillo, Texas

The New Mexico Water Resources Assessment for Planning Purposes was released by the Bureau of Reclamation Southwest Region and the State of New Mexico in November 1976. The objectives of these studies were several: To inventory the water resources and other natural resources that require water for their development; to develop projections of the future distribution of population and economic activities, whether the State's future growth is high, medium, or low; and to determine methods to meet water needs with management of existing water rights, interstate compact agreements, and court decrees, given these projections. A further objective was to analyze the possibilities of augmenting the water supply through water importation, weather modification, desalting, or some other means.

The assessment report lists 24 agencies that cooperated in providing data and assistance in the investigations. We want to especially acknowledge our gratitude to the New Mexico State Engineer Office and to the New Mexico Interstate Stream Commission who provided extensive data, technical expertise, and review. The Governor's office assigned the responsibility for the comprehensive planning of water and related land resources to these two agencies.

In the first phase of the planning work, the State Engineer Office, with the cooperation of the Interstate Stream Commission, completed an inventory of the water resources of New Mexico and the current uses of those supplies for all purposes.

The second phase of the program included the development of projections for the distribution of population and economic activities in the State.

The third phase, involving water and related land resources, determined the manner in which water requirements for the projected distribution of population and economic activities might be met with supplies available to the State under existing interstate agreements and court decrees.

The fourth and last phase in the program determined the prospects for importation of water, for weather modification, and for desalination of waters to maintain present uses and to furnish projected requirements that could not be met with presently available supplies.

The 1976 Assessment includes a brief history of New Mexico. It was the 47th state admitted to the Union, attaining statehood January 6, 1912. From the Sandia culture of 25,000 years ago to the pueblos and reservations of today; from Onate's use of Spanish Saints for village names to the 1821 opening of the Santa Fe Trail; New Mexico has one of the richest histories of any State. It is quite a transition from that period to the base year 1980 with its future population, economic, and water need projections.

In 1967, the Southwest Region of the Bureau of Reclamation initiated studies on the Rio Grande and Pecos River Basins to update water supply and use information. The goal of these basin studies was to develop conservation and optimum use measures for the limited water supplies. State officials requested these studies be combined and focused toward a water resource development approach for the State. Through public meetings and working in conjunction with the 24 agencies mentioned earlier, the Assessment report presents possible alternatives and their combinations to meet present water requirements and future water needs rather than a formal State water plan.

Most of the information presented in the Assessment reflects conditions as they were in 1974. The water requirements were based on 1970 usage statistics, except for irrigation which was based on 1969 usage. For purposes of evaluation, statistics contained in the report are nearly 10 years old. The water requirements for the future are based on projected 1980, 2000, and 2020 population levels. The projections were predicated on the premise that, should the population not attain the growth level at exactly the year predicted, it would eventually reach that level at some future date.

The planning process concepts for water utilization and management began basically with the assumption that existing supplies were inadequate to meet all of the projected requirements. Therefore, a systematic framework was developed for managing the existing water supply to best meet projected needs. The possibilities for augmentation included utilizing the existing supply within the State and importation of surplus water from outside the State. Planning for augmentation and development of projects or facilities takes many years and could not alleviate problems existing today, although they can be considered for long-range planning.

This is a brief historical background of the beginning and development of the New Mexico Water Resources Assessment. The purpose of this address is to share the key findings, problems, and issues documented in the Assessment as they relate to the five topics of Water and Agriculture; Saline Water; Energy and Water, Water Rights; and National Water Policy, which are under consideration in the course of this conference.

Water and Agriculture

Water used for irrigation constitutes New Mexico's largest use, amounting to more than 80 percent of total withdrawals for all purposes. Land in the State receives irrigation water through systems ranging from simple rock and brush structures and hand-dug ditches, to complex systems of permanent concrete diversion dams and storage reservoirs. In 1969, about 51 percent of the water for irrigation was obtained from surface sources and 49 percent was pumped from wells. Irrigated agricultural and grazing lands comprise about 85 percent of the State area and, taking into account reservoir evaporation, deplete nearly 90 percent of the beneficially used water supply.

The role of agriculture in the economy of the State is decreasing, but in relation to the use of the natural resources of land and water, agriculture is of major importance. Significant changes have taken place in the structure of the economy during the last quarter century. The uranium and petroleum industries, along with other expanded mining operations, added to a tremendous economic boom for the State beginning in the 1940's. However, agriculture's contribution to the gross State product has remained about the same.

Major components of the agricultural enterprise are livestock and livestock products. Cotton lint and cottonseed have become among the most important cash crops in the State. Other important livestock related crops are hay, sorghum grains, wheat, and broomcorn. Additional cash crops of significance in the State are chilies, onions, pecans, and apples. On the average, 90 percent or more of the agricultural cash receipts come from the sale of crops from irrigated lands.

The largest land use category in the State is for livestock grazing. This area amounts to almost 64 million acres. Irrigated croplands amount to slightly over a million acres, and dryland farming areas total nearly 1-1/2 million acres. In many areas of the State the water table has lowered as a result of large-scale pumping, mainly for irrigation. Extreme declines in water levels have been experienced in many areas, and surface flows have been diminished in areas where surface and ground supplies are interconnected. Some irrigated lands are being abandoned because ground water storage is inadequate to supply the continuing demands. Drilling deeper wells and locating new wells further apart to spread the mining effect have increased pumping costs.

The problems of ground water mining are becoming especially acute in the Pecos River Basin and Texas-Gulf Basin, an area which begins in the extreme southeastern part of the State. Heavy pumping of water for irrigation has been developed in both areas. There is essentially no recharge in the Texas-Gulf Basin, and serious encroachment of saline water is occurring in the Pecos Basin and in the Roswell Artesian Basin. In some areas around Portales, the economically usable ground water for irrigation purposes has been essentially exhausted.

An issue related to irrigation and agriculture is water used by a broad grouping of plants called phreatophytes consisting of water-consuming grasses, shrubs, and trees. The valid water right holders are prevented from using the water taken by these plants. In New Mexico, the highest consumer of water among this group is saltcedar. Phreatophytes cause accumulation of stream channel sediment and block river channels increasing flood hazards. Saltcedars also prevent access to water by livestock and for recreational use.

Water erosion and sedimentation are also serious problems in New Mexico. Types of erosion present in the State are sheet, rill, streambank, and gully. The most serious in New Mexico is gully erosion which consists of the progressive widening, deepening, and extending of watercourses. This carries sediment which clogs streams, diversion works, and irrigation systems.

Regarding agricultural water as a future issue, the Assessment incorporated several assumptions. The projected irrigation requirement estimates were based on the assumption that all surface water presently used and committed to irrigation, including authorized Federal projects, would remain in irrigation. It was also assumed that available ground water supplies, in areas where possible, would be used to expand irrigated agriculture. It was not expected or assumed that the estimated level could be sustained without augmentation if all projected needs were to be met. It was estimated that an increase in irrigated acreage over that of 1969 could take place in 15 counties. However, many of these areas would be short of available water to serve the total developed area by year 2000 or 2020. Reduction of irrigation would probably occur unless replacement water became available from an outside source.

One of the major assumptions used in the study was that increased needs for municipal, industrial, and mining, uses would be met by retirement of irrigated agriculture. Fundamental to this assumption is the prior assumption that irrigation water produces less cash return than an equal amount of water used in manufacturing or mining. Therefore, it could be purchased and transferred to such a higher economic use. Drying up large acreages of irrigated land to furnish water for municipal, industrial, or mining purposes could have an adverse economic and environmental impact on a large number of people. For this reason, the Assessment stressed the importance of investigating and developing methods of augmenting the State's usable water supply.

Saline Water

The use of water for nearly every purpose results in some degree of deterioration. Every flowing stream at some point is affected by increasing salinity levels. Irrigation, municipal, and industrial use can all degrade the water quality.

The extent and severity of the salt problem in irrigated areas depends on several factors besides the quality of the water supply. It depends on the nature and composition of the soil and subsoil and topography of the land. The amount of water used, method of application, and kind of crop grown are factors. The severity also depends on climatic conditions, ground water, and surface water drainage.

Historically, the Pecos River Basin has carried a heavy load of salts, with certain reaches adding tremendously to the salt concentrations. As long ago as 1942, the National Resources Planning Board summarized the salinity conditions of the Pecos River Basin as being particularly acute. In most areas being mined for ground water, the salinity encroachment is becoming a problem of increasing proportions.

It was pointed out in the Assessment that certain basin areas possessed moderate to severe salinity problems. These areas are quite widespread encompassing the south-central and eastern portions of New Mexico. These sections of the State are generally experiencing a declining water table, and saline waters are encroaching into the freshwater portions of the aquifers. In some widespread areas, manmade and natural discharges not only are now exceeding the recharge, but have been for many years. As present conditions of use and recharge continue, the decline in available freshwater threatens irrigation and municipal supplies.

Sources of water not presently being used are the large bodies of saline ground water in the Tularosa and Salt Basins in south-central New Mexico. There is an estimated 30 million acre-feet of slightly saline water within the unconsolidated deposits in the Tularosa Basin. The quantities of moderately and very saline ground water are of the same order of magnitude.

As demands for water increase, the shallower freshwater aquifers in most areas will not be able to supply the demand. It may become necessary to use saline water. As desalting processes become more advanced and more economical, the saline ground water may be recognized as a valuable part of New Mexico's total water resources.

Energy and Water

Power is a major industry and one of the fastest growing of all industries within the State. There are several pump storage hydropower sites in the Rio Grande and Rio Chama Basins, which have potential. Some sites have been studied in the past and are regarded as having potential for development, considering the escalating cost of fossil fuels required for thermal power generation.

In the 1950's, the potential for pumped storage development at Elephant Butte Reservoir and at a number of alternative sites in that area were studied.

The Bureau of Reclamation operates the Elephant Butte powerplant, a feature of the Rio Grande Project, The plant has a nameplate rating of 24,300 kilowatts and has been producing electric power since November 1940.

Generally, the Nation's power production doubles every 10 years. However, between 1950 and 1965, the installed capacity of the State's electric plants increased 600 percent and the amount of power generated increased 800 percent. The largest gain has been the development of the Four Corners plant in San Juan County. Across the State there are a number of investor-owned thermoelectric generation plants powered by fossil fuels, the newer of which are in the Four Corners area. At present, no nuclear-powered generating plants are located in the State. The Tularosa Basin area has been viewed with interest for nuclear power development due to its large quantity of saline water, less densely populated area, and fewer environmental problems.

Based on past production, it was projected that New Mexico's power generation will increase 15 times during the 50-year period 1970 to 2020. The two most important factors in estimating future power production are supplies of water and fuel. The estimated water depletion for power in 1970 was 28,600 acre-feet. The State has large known coal reserves but, where the coal is abundant, there is a limited amount of unused or uncommitted surface water.

Although the actual rate of increase between 1950 and 1965 was over 600 percent, the estimated annual rate of increase in power production for both the State and Nation after 1980 is 4 to 5 percent. By 2020, the projected plant capacity for New Mexico was estimated to be almost 36,000 megawatts. The Assessment projected that by 2020, 65 percent of the State's power generation would come from use of nuclear power.

The generation of power by geothermal means is a future possibility. There are known potential areas within the State, for example, the Rio Grande Rift. If this generation process is used, it could reduce the water requirements for cooling.

Another future energy resource of New Mexico is solar power. Studies and experiments are underway to determine solar energy potentials and practical applications. An additional energy source with definite possibilities is wind energy. Research is oriented toward obtaining detailed information about the energy output, maintenance problems, and operational characteristics of small wind-driven generating systems.

Clayton, New Mexico, is the home of the first in a promising line of wind machines, built jointly by the Department of Energy and National Aeronautics and Space Administration. The 200-kilowatt Clayton generator began operating early this year.

Recent advances in wind turbines could make wind energy competitive with expensive petroleum. The advance of this technology could also reduce the water requirement for cooling and free it for other uses.

Water Rights

New Mexico's water laws are based on the doctrine of prior appropriation as set forth in Article XVI of the State Constitution. Administration is vested in the State Engineer. Ground water is subject to regulation within the same general scheme of law applying to surface waters.

New Mexico is under commitment to eight interstate compacts which affect development and use of water in the State. Where there is a close relationship between occurrence of ground water and the flow of surface streams, coordinated administration is required to assure that valid rights will not be impaired.

Water in New Mexico is a commodity or property right owned by the people, and its use is closely governed by law. A change in use, such as retirement of irrigation water rights, was discussed in the Assessment as one plausible method to secure water for municipal and industrial use. Currently, there is a growing trend of transfers from agricultural use to municipal and industrial use. Under the State law, the point of diversion and place and purpose of use of a water right can be changed upon issuance of a permit from the State Engineer.

The regulations governing the use of ground water are also furnished by the State Engineer. These are quite detailed and are quoted in the Assessment.

New Mexico receives water from upstream states, mostly from Colorado, by way of the San Juan River and Rio Grande. Commitments to downstream states under existing interstate compacts and court decrees require apportionment of water to those states. When New Mexico has fully developed its surface water resources, within the allowances of interstate compacts and court decrees, river outflow will approximate river inflow, and the State will be using only the amount of streamflow produced within the State.

Other legalities affecting water use in New Mexico are the three treaties between the United States and Mexico. These treaties impact on the State in its use of Rio Grande water and as a Colorado River Basin State.

Except for small quantities of available undeveloped surface water, the surface supply is fully appropriated. These surface waters are being used beneficially within the terms of international treaties, interstate compacts, court decrees, and State laws.

New Mexico's water laws have a long history of controversy. At the time the Assessment was written, there were over 100 water law adjudications by the New Mexico Supreme Court. Some of the decisions that have far-reaching effects were discussed in the study. These include the Hope Decree, Arizona vs. California, Colorado River Basin Project, San Juan River Decree, Sugarite or Chico Rico River Decree, and Globe Equity or the Gila Decree.

Four important cases before the Federal District Court which were pending at the time the Assessment was prepared, and which are still pending, regard the water rights of the Pueblo Indians. Each of the four suits, each dealing with a specific stream, is requesting court determination of the water rights of all users, both Indian and non-Indian.

National Water Policy

Secretary of the Interior, Cecil D. Andrus, in a news release last month, discussed the key role of the States in reforming national water policies. Secretary Andrus told the National Conference of State Legislatures that State and Federal water policies are so intertwined that they must be jointly developed if they were to be effective at all. The Secretary reported that there is an urgent need for a national policy which will inventory water resources, calculate future demands, establish priorities for water project construction or improvement, and better coordinate the many water programs that now exist. One primary problem concerns the need to repair and improve severely overburdened domestic water systems.

Regarding the critical ground water situations, he observed that certain States have acted to provide for local control, but others were in dire need of an effective ground water management act. This responsibility is primarily the State's and it urgently needs action. Secretary Andrus told the State Legislatures that they were the people who could get the job done.

The Secretary suggested that consideration should be given to having State Governments pay a portion of the cost of proposed water projects. He believes that this would give each State the incentive to establish priorities for projects that have merit. Priorities are needed for the approximately $34 billion backlog of water projects that have been authorized, but are not yet funded by the Federal Government.

Noting the escalating costs and environmental implications of water project construction, he remarked that the States must start looking at alternatives, such as improving the systems they already have and at conservation practices. Less wasteful water policies can save us both the water and the billions of dollars required for additional projects.

In applying the Secretary's remarks to the State of New Mexico, it is apparent that this State, through its State Planning Office and New Mexico Interstate Stream Commission and State Engineer Office, has already accomplished the majority of items discussed in the news release. You have inventoried your water resources, calculated future demands, and prioritized construction programs. You have instituted local and State control of the surface and ground water. You are evaluating conservation and improvement of existing systems, as evidenced by the New Mexico Water Resources Assessment, and by this conference itself.

Conclusion

In summarizing the Assessment, it is evident that one of the most apparent features of State's water supply is the unevenness of its distribution. Water problems and needs differ from basin to basin due to differences of climate, source of supplies, and distribution of population.

New Mexico is a water-deficient area regarding availability of freshwater to maintain present irrigated agriculture and to meet other projected needs. Since the State water supply is limited, development and management should be planned accordingly. The total quantity of water physically available to the State is adequate to sustain only a certain level of economic growth through the time frames of the Assessment, but there is not enough water to meet all of the projected requirements.

Some problems confronting New Mexico are urban water quality, mining of ground water, rural water quantity and quality, infestations of phreatophytes, sedimentation and erosion, flooding, and ground and surface water salinity.

In the interest of developing an augmented water supply, the Assessment briefly presented four alternatives: importation, weather modification, desalination, and geothermal. Further consideration was recommended for nuclear and solar power development.

The Assessment does not treat in detail such problems as air pollution, solid waste disposal, or the social, psychological, or environmental effects of high population density.

The authors of this report have neither the authority nor the desire to set the State's policy regarding population or economic growth. Without advocating any one of the projections, the report does provide an opportunity to look at a wide range of possibilities.

All planning and research which could result in a solution to New Mexico's water supply problems should be carried forward at every opportunity. This presentation on the New Mexico Water Resources Assessment for Planning Purposes has reviewed the problems and issues facing the State. Hopefully, this will provide substantial background for consideration in the workshop discussions as this conference continues.

LUNCHEON ADDRESS

Dr. Thomas G. Bahr
Director
Water Resources Research Institute
New Mexico State University

I would like to share with you my observations and some personal philosophy on water and water research, and how they might apply to New Mexico. It might be helpful to put my comments into perspective by telling you how I got involved with water in the first place.

In 1960, I was attending college at the University of Idaho, studying to be a forester. For some reason I wanted to work in the woods. In those days and even today, all students that were between their sophomore and junior year in college had to attend forestry summer camp. Some of you probably know what forestry camp is all about but for those of you that don't, it's a place where you get an opportunity to sample the kinds of activities that professional foresters eventually get into sometime during their career. These include such things as timber cruising, log scaling, learning forest ecology, fire fighting, log rolling, axe throwing, and tobacco spitting. Our summer camp was located in Central Idaho near McCall and it was a particularly dry summer that year. We had just spent a week fighting a fire and were then scheduled to spend the next few days on a high dusty mountain studying a new high-line technique for getting logs to the bottom of the mountain. Well, like I say it was hot, dry and dusty and all of us wanted to get back to McCall because it was next to a beautiful and wet lake. We finished our work on the dusty dry mountain, returned to McCall and the next day we found out that we were to spend the next two weeks on a subject called limnology. I thought that had something to do with the science of taking limbs off of trees and I pictured a return to that hot-dusty-dry mountain again.

As it turned out, limnology was not the study of limbs but the study of freshwater lakes and streams. We went to the banks of the beautiful Salmon River and spent two weeks measuring water flows, sampling water for chemical analysis, examining the stream bottom for aquatic insects and studying different fish management techniques. To make a long story short, I liked the idea of working in and around water and decided to become a limnologist.

My fixation to water took me to the state of Michigan because of its vast opportunity to work in the water field. I completed my graduate work there and returned to the west and spent a few years at Colorado State University as a young Assistant Professor teaching Limnology. I returned to Michigan to spend the next eight years in the water resources field.

It was there that I got my most comprehensive exposure to water management and the role of research in helping to solve water problems. The emphasis there was on water quality. Large numbers of people along with industry had put enormous demands on water resources of that state.

Although the water was not depleted in the sense that supplies had dried up, much of the water became so grossly polluted that it was no longer suitable for many uses. Toxic chemicals contaminated thousands of tons of fish, beaches had to be closed because of pollution by municipal sewage and many other beneficial water uses were threatened, even navigation. For example, on one of the tributaries to Lake Erie a paper mill was discharging its effluent into the stream. Paper fibers would settle to the bottom and lie there and become compacted. Two or three times during a summer, gases would form under this compacted layer of paper fibers and produce a raft two to three feet thick that would eventually float to the surface of the water. They were so thick you could actually walk on them! There was quite a bit of boat traffic up and down that river and many had to wait until these paper rafts floated out of the way down to Lake Erie. That's a water quality problem!

Many of you may not be aware of this but there was a significant demand for groundwater in the state and in some areas groundwater depletion was a very serious problem. There were also important institutional and legal problems over the jurisdiction of water and it's management and these had to be addressed before any progress could be made.

To make a long story short, I learned that there were no simple solutions to water problems and furthermore, no single water user group, be they industrial users, agricultural users, recreation users or municipal users, had all the answers. What would benefit one group in many cases was to the detriment of another group. At that time I said to myself "self" as a research administrator should you get involved in deciding which management scheme is the best. The answer was "NO". I said to myself "self" is that a cop out and am I avoiding responsibility? Myself took a long time in answering that last question, but eventually the answer took shape, it goes something like this:

It's probably not very productive for a trained scientist to question whether one should or should not modify his environment to suit the needs of a particular group of water users. The very nature of the human species is to modify his environment and as long as there are people, there will be change! I've accepted this. I think, though, from the standpoint of a scientist and a research administrator, what <u>is</u> productive is that the role of research in water resources management should be to assure that results of our actions are foreseen; that they're predictable, and that they are laid out in such a way that the public can look at the options and determine whether or not they're acceptable. Through research we can help predict what the consequences of various alternative management schemes are going to be. Through extension and other outreach programs of the university results of research can be put out on the table for scrutiny by the public. It is the public that is going to make the final decisions. It is incumbent on the scientist to provide answers to what the future will be like under different scenarios.

Getting back to my point there are no simple solutions to water problems. Let me stress that the research needs related to these problems are also not very simple. This takes me to the topic of what is going to be the future direction of the Water Resources Research Institute and the programs what we administer. First of all, let me say that I will probably not be charging out in some radically new direction. I said probably. If I were to outline

to you right now a very detailed research plan I would not only be kidding you, I'd be kidding myself. I do, though, have some thoughts on the general boundaries within which I would like to see research proceed.

* Develop a comprehensive plan that will take into consideration the water problems of the state and region as well as the availability of the scientific talent required to complete the research. This plan will be developed in close coordination with water users and managers. In this respect it is particularly important for you people to make your views known especially as they relate to the kinds of research you think need be done before a problem can be solved or an issue resolved. This conference is an excellent forum in this respect.

* Stick to the plan!! I don't mean to say that a plan has to be rigid and closed to new ideas. On the contrary, I think it should be receptive to new ideas. By saying stick to the plan, I mean that we should be aggressive in recruiting the resources and promoting the topics of the plan. This is opposed to being passive in research; simply jumping from topic to topic as funding becomes available. Put another way, I am saying be a carnivore and select and pursue your prey. Don't be an omnivore and simply take what passes by.

  In Michigan we had a research plan for water quality management. At that time portions of this plan were not very popular with the lead funding agency (EPA) and funds simply were not available. None-the-less we felt strongly that the research simply had to be done. We spent over four years trying to fund the project. We stuck to the plan and eventually raised $2.5 million. The topic of the research soon became very popular with EPA but the problem then was already upon us. In many ways I believe that research designed to meet the needs of today's problems will often be too late for input to the solution of the problem when the results are in. We need some real crystal ball gazers in this respect.

* Write down the plan in black and white and subject it to scrutiny. I think if one is to have an adaptable plan, researchers should have the opportunity to see the plan in order to see how they might fit in. The same holds true for the users. They should see it in order to input their ideas and assure themselves that the right questions are being asked.

These are broad boundaries in which we will proceed into the future As the plan is coming into sharper focus for me, I see a few areas that are sure to demand attention. I'll list some of these that we are getting into now or are sure to get into the next year - not listed in any order of priority:

* Water use efficiency in agriculture - Research will continue in developing irrigation techniques and plant varieties that use less water.

* Water quality management research - This is research whose goal is to minimize water quality degradation as it is used. Be it agriculture, energy development, or other industrial and urban use.

* Developing acceptable schemes to integrate recreational uses of water with other demands on this scarce resource. I believe that there are many areas where recreational uses of water are compatible with other uses.

* Research on saline water.

  Desalting itself, it is not a panacea. Although we have vast amounts of saline water in this state, it is not an unlimited resource. The technology of desalting is improving but it is not going to be the total solution to the economic development of the state.

  Saline water development is a high priority topic. This would include research on using saline or brackish water directly for such things as irrigation of salt tolerant plants. Use of saline or brackish water for aquaculture shows great potential. There is a lot of aquaculture research going on in coastal regions of our country that shows great promise in the growing of such items as shrimp, shellfish and finfish. I am confident that through research we can do the same with our brackish groundwaters.

  I should mention that the Institute has just signed an agreement with OWRT on the use of the Roswell Test Facility to do a vast array of research in saline water development. I see a bright future with many exciting opportunities in this area.

* Comprehensive economic and legal assessments of water management have to be done. We should be taking a total, "holistic" approach to water development, weighing all the costs and benefits.

* Technology transfer - We will be putting more effort into this area in the future as we get the resources to do it.

These are just a few elements of what I am sure will be in such a plan. Let me close by sharing with you a quote I heard sometime back and I forgot who said it...but it goes like this: <u>"Logic is the Loudest Voice Spoken First"</u>. Let me encourage all of you to be logical this afternoon in your workshops. Speak up. This is your chance for input into the important vital water issues that are facing us here in New Mexico.

Thank you.

WATER AND AGRICULTURE

Dean L. S. Pope
Dean of College of Agriculture and Home Economics
New Mexico State University

There were 34 people in attendance during the Water and Agriculture Workshop, and a lively discussion ensued. Competition for water, desalting, the national water policy, and section 208, all as they relate to agriculture, were considered.

The Governor's Council has predicted that agriculture's use of water will slip from approximately 93 percent of the total, to 67 percent. We explored different alternatives that we saw for the future. It appears that we are not likely to conserve ourselves into a rich supply of water. We may conserve up to a point, but a viable expanding agriculture is going to demand more water then the above share would indicate.

What can be done to reduce the amount of water that agriculture needs? We talked about the possibility of changing cropping patterns and introducing more drought-resistant crops. For example, the Clovis area is one of the first that will have to change certain cropping patterns and cultural methods due to the dwindling water supply there. For example, is it possible to grow such crops as sunflowers and others that would require less water? One interesting suggestion was that New Mexico might be in a favorable position for seed production. For the same return as we get from forage or grain, seed production might use less water. The possibility of guayule, a latex-bearing crop, was mentioned. While there is no completely drought-resistant crop, we might be able to develop varieties or strains of certain crops that would use less water. If there is a possibility that certain crops can grow and approach optimum yield with less water, agriculture should seriously investigate these. This will be one of the major thrusts by the Agricultural Experiment Station over the next few years. Currently, tests on a number of alfalfa varieties show some with marked differences in the amount of water required for growth. If it is possible to use less water and still get high returns, research must lead the way. But, there will be a time lag from the point research is completed until the results are applied.

Also discussed was whether agriculture needs water and land policies. The question asked was: "Where is agriculture on the priority list for water?" Water users were listed by priorities

and at the bottom line was agriculture. Despite the possibilities of long-range food shortages, in which the prices of food and products of agriculture might become higher, and despite the fact that intensified production under greenhouse systems could improve the priorities for agriculture, still, it seemed that under today's situations the bottom line would indicate that agriculture will be far down the list as to what it could pay for water. With a national "cheap food policy" and the fact that New Mexico's total production is small compared to the national picture, our production systems might be at a disadvantage without affecting the national picture. Again, this puts agriculture at a low end of the priority list in what it can pay for water. It was estimated there would have to be a ten-fold increase in agricultural returns for agriculture to compete financially with other industries or urban use for water.

Conservation may lengthen the life of agricultural use of water. One of the more unique suggestions was that irrigation, as it is practiced, involves a certain amount of water loss. For example, without proper flow channels, losses of 10 or 15 percent of the water may occur through seepage and evaporation. Therefore, if local areas are interested in trying to keep a strong agriculture, and competition position, a bond system that would allow for system improvements to take place at the public's expense could be undertaken with the idea that the public might get back the part of their input. For agriculture to conserve that 10 or 15 percent, outside support would be required since the profits from agriculture are not enough to make the necessary changes in the system.

The possibility of progressive rates for water use in agriculture, of local, state, or national policies that deal with water use, and agricultural subsidies were discussed. Of course, the obvious questions: Where will the funds come from? Will they be economically attractive? How can they be put to use? What would research show to be the best use of funds available?

As for desalting water, it appears to be too expensive for agriculture in volume. Although there might be some long-range possibilities, in the short-run, the cost factor appears most prohibitive. Still, it is an intriguing area, and the committee urged more to study the possibilities for desalted water -- perhaps on more localized situations and smaller more intensified areas. One item is to see what is really needed in terms of quality of water for crop production and the problems associated with its use. Is it possible to select plants that are resistant to or have a higher tolerance to salt? Other questions were raised such as: What irrigation technology is required in the use of desalted water? Could trickle irrigation be used? Could trade-offs with industry be made? Could effluent from industry be used in agriculture? Basically, however, the pro-

blem of desalting water for agriculture comes back to costs. Desalting water required energy, and it was estimated that about 60 percent of the total cost of desalting is associated with the cost of energy. Where will this energy come from in New Mexico? Another real problem with desalting on a massive scale for agriculture is what can be done with the brine that is produced as a waste product?

Other possibilities were also discussed such as using a blend of partially desalted water and fresh water, and possibilities for aquaculture, greenhouse use, and high-salt tolerant crops. All these seemed to point to a real need for intensive research but results will take time.

A National water policy and its impact on agriculture was discussed. The discussion focused on questions such as: Should agriculture favor a national water policy? Should these decisions be made on a regional, state, or local basis? It was pointed out that agriculture needs to take into account, in a water policy, all the benefits, direct and indirect, of that agricultural water to society as a whole. At Elephant Butte, there are other benefits from water such as water skiing, fishing, etc., that benefits a much wider group than the farm sector. Policy should be based on the total picture and all the water costs must not be charged to agricultural use alone.

How then, can the true value of the water in the West be measured? Should a water use policy be formulated on a national level or regional or state? A regional, state or local approach was preferred. One of the problems that our group seemed to consider important is that New Mexico in any national water policy, is likely to be shorted. Our impact is not that good. The group favored some sort of regional or national policy relating to underground water, possibly an interstate policy that may not need to reach the national level. As far as agriculture was concerned, the group favored guidelines and overall policy from Washington, but implementation and operation left at the local level. Regional basin agencies, like those already established in some areas, were suggested.

Section 208 of the Water Pollution Control Act was discussed in detail. This section deals with point and non-point water pollution problems in the United States, and has real implications as far as water use is concerned. For example, the best management practices that would reduce runoff from range areas might point directly back to over- or under-stocking of a particular area. How will this be determined, by what standards, and what procedures will be used? When and if these points are decided, what kind of "encouragement" will be used to change the practices? Secondly, it seems that the October deadline for a comprehensive plan for the state is simply unreasonable; an ex-

tension of the October deadline would allow more research as a basis for the right decision.

There were arguments on both sides. Some participants felt that we have waited long enough, and that a preliminary judgment based on available information is possible. Others argued that it could result, a few years down the road, in the constraints that are not wanted or necessary; that it would be better to obtain basic information through research before launching out with various prescriptions to cure pollution. The consensus of the group was to wait for more research. Evaluation of techniques that are to be used in determining these non-point sources, the multiple-use concepts of land and how they might affect runoff, and the recreation and agriculture interface were only some of the points that should be considered.

In summary, these were the four areas discussed during the Water and Agriculture Workshop. It seems that agriculture is still probing for the answers. A number of questions are being asked the agriculture sector, questions that have no immediate answers. The very fact that these questions are being asked suggests the importance of the situation if New Mexico is to grow and prosper in the future.

SALINE WATER - REVISITED

Frank DiLuzio
Los Alamos Scientific Laboratory

Donald Brandvold
New Mexico Institute of Mining and Technology

The title of this Workshop came from a general feeling that the desalinization and/or utilization of saline water had at one time been a rather high priority item and now seems to have been placed on the back burner. It was felt that it is time for re-emphasizing this area of water research and technology in view of current and projected water needs. The once through water use has been wasteful in the past, is now, and multiple use must be emphasized. Under right conditions desalting can make a contribution in both producing usable water from brackish sources and as in process treatment to improve water in industrial process.

Not only is the amount of potable water in the United States limited, but water suitable for agriculture and industrial use is in short supply. This is especially true of the Western part of the country. In some areas, there are large quantities of brackish or saline water that could be used to free or supplement the fresh water supplies. Where this is possible, it would be very desirable. Often the reasons given for not considering desalinization have been economic.

Generally, water desalinization has been considered expensive when compared to alternative sources. In many cases this is justified. However, if one considers the hidden costs of other water developments, the economics may be more favorable. For example, many cities and industries use large amounts of water for which they pay low prices. If the payments would include the original cost of building a dam or developing reservoir capabilities, the prices would be higher. The difference in those costs have been borne by taxpayers as a whole. Another problem with reservoir waters is that large amounts are lost through evaporation and by transport through ditches. Large water projects cannot meet small community requirements as they must be built either in anticipation of needs with investments idle, or long after needs exist equal to storage and conveyance capacity. Taking all factors into consideration, perhaps there are situations where desalination for specific communities is cost competitive or to be preferred.

There is no question that the original capital cost of desalinization plants are high. Alternatives have up to now been available and attractive. These alternative sources are being depleted, however, and desalination needs to be included in overall water planning. In some areas even now, desalination of water is the only realistic approach.

One of the fundamental questions repeatedly raised at this Workshop was "What should be the respective roles of federal and state government in desalting water?" How much up front funding or cheap long-term loan should come from government? Should not government

participation be reasonably expected when a reliable water source will provide an economic boost to a community, state or region? An example that applies to New Mexico, is the water situation in the northwestern part of the State. Here there is a tremendous amount of energy production with accompanying water usage. This water usage will increase. Perhaps the government should become involved in water supply here since the energy production is of benefit to the entire nation.

Consideration of energy production introduced other topics that were discussed. Energy production is often carried out or is feasible in areas where large quantities of brackish water are available. The typical energy generating plant has tremendous loss of heat energy. In still other situations, there is high waste of mechanical energy. Much of this now wasted energy could be used to desalinate water through such techniques as vaporization, and vapor compression, reverse osmosis, etc. for both industrial or commercial process use and potable water for domestic use. Energy would be put to a good use and usable water provided at the same time. This kind of situation should be taken into account when planning. Possibly, government pressure should be put on certain industries to locate where brackish water can be used directly or their waste energy could be used to desalinate water. The most often mentioned site was the Tularosa Basin.

Many participants stressed that more consideration needs to be given to water that can be used directly or with only mild pacification. A favorite topic was the agricultural use of brackish water. This was discussed including the techniques developed in Israel and California for isolating or developing strains of salt resistant plants. The area does show promise. It was proposed that the government take a more active role in the utilization of brackish water by agriculture.

Another aspect brought up was that although huge amounts of money have been spent on research to remove salt from water, there has been comparatively little spent on actually building working models. In other words, the transfer of the knowledge from the scientific lab to actual on-site plants has been minimal. Instead of building more and more demonstration plants, why not build at least one major on-line system? There have been many new materials such as teflon and stainless steel developed that are much more corrosion tolerant than those previously available. Many of the economic studies were done before those were in use. Newer and better membranes exist. Plants, not models using these should be built. The same techniques can be used for waste water clean-up allowing municipalities to go on a semi-closed loop water system. Research should not be stopped. Probably it should be expanded. However, actual plants are needed, as nothing takes the place of a high visibility desalting plant producing water as part of an operating system.

The last major topic discussed was the environmental problems associated with brackish water clean-up. These will be of two main kinds. There will be either a brine or solid salts to dispose of and the pumping of saline water from aquifers will have effects on the ground water in the region. More specific site studies must be done.

ENERGY AND WATER

WILLIAM F. LORANG, P.E.
Environmental Affairs Department
El Paso Natural Gas Company
El Paso, Texas

Dr. Bahr told us that we were going to have a workshop, and he meant a workshop, and work we did. We had 31 participants and we stayed until 5:00 p.m.

Before going over the report, I would like to thank Lynn Brandvold, for her efforts in recording and reporting; and the rest of the workshop participants for their interest.

We debated and hasseled about these subjects:

* The water demands for New Mexico,
* Conservation practices,
* Research objectives,
* Water quality requirements,
* Augmentation of water supply, and
* The use of non water-intensive energy sources.

From the discussion, it is rather apparent that there are problems concerning water for energy use. The supply of water available for use in New Mexico is limited, and will be of primary concern. If industry is to plan large energy related projects, and expenditures in the multi-millions of dollars, they must have a dependable and certain supply of both raw materials and water. Water and energy are inseparable. The limited supply of water in New Mexico may be the basis, the measure and the bottom limit to problems associated with water use for energy production.

In this water-short west, industry is now using methods of water conservation, recycling reuse, and treatment to save the amount available for use.

Industry can use almost any kind of water; however, the price of the end product will generally reflect the cost of the necessary water treatment. That price may or may not be acceptable depending upon how badly you need the end product or how thirsty you may be.

Our discussion group looked at the how, the why, the when and the where questions to water for energy development. We prepared quite a list of questions for discussion which are all addressed to the panel. Of course, some of the questions may overlap what has already been reported by other workshops, but the following questions were raised by workshop attendees which were felt to be of importance.

* What are your feelings toward the priority of energy alternatives? Has any thought been given to prioritizing energy production with respect to the amount of water used per energy unit produced?

* Along the same line, is there a place in the state government for planning for energy production, for planning water use, and project implementation? Should there be a clearinghouse in the state that coordinates plans for water/energy projects? Is there ongoing anticipatory water planning program in the state?

* What could be done to identify and alleviate certain impediments to water use such as litigation, ownership problems, and legislative and procedural problems?

* What research efforts could be made to identify new energy alternatives, such as hydrogen generation and pump storage possibilities? Should there be research efforts made along the line of gray water use, the recovery of evaporation losses, the use of brackish water for cooling, weather modification and water harvest methods.

* Will the state legislature consider severence taxes for energy exported which could be earmarked for water use research?

* How can we provide a better interface between research efforts and the implementation of research results?

* What are the state and federal governments doing to solve the Indian water rights problem? Do you see a solution to the problem in the near future?

* What is the state's position regarding exportation of water in the form of coal slurry? Are there possibilities for interbasin or interstate imports for water used in coal slurry?

There were many more questions raised and discussed some of which were answered during our workshop session. But, in the interest of time, perhaps we should stop here and listen to the panel's response.

It has been a pleasure for me to participate in this water for energy workshop and I thank you very much.

NATIONAL WATER POLICY

MR. JESSE GILMER
Rio Grande Compact Commission
El Paso, Texas

Good morning ladies and gentlemen. Our group was assigned the subject National Water Policy; my report is brief.

Throughout the history of New Mexico, the state has operated to the satisfaction of its citizens without any national water policy. It is the concensus of our group that in the absence of the national water policy, the state and its citizens could continue to operate for the benefit of the state. Should there be established a national water policy, however, our group recommends the following:

* The states have a primary authority and responsibility for water resources management.

* The role of the Federal Government should to be to provide assistance to the states in the development of programs to meet state needs.

* State and regional programs should be weighed more on the needs of the state, region, and nation than on the economics involved. Water resources management must be approached in a more comprehensive and coordinated manner at Federal, State, local, and Interstate levels.

* Federal actions must be consistent with adopted state and interstate water and related land resources plans and programs.

* There must be continuity, coordination, and flexibility in federal support for water planning and implementation programs.

* Federal project financing, cost sharing, and cost recovery policies should be reviewed and simplified to eliminate inequities and inherent biases toward specific solutions to water problems and promote equal consideration of structural and non-structural solutions.

* Water conservation must be the fundamental consideration in all future water management programs.

* Federally supported water resources research should be expanded and tied closely to the planning and management concerns of the states.

* Any claims to federal reserve water rights, including those for Indians, must be initially addressed within the framework of established state systems.

* We recommend that the Reclamation Act of 1902 be modernized to become a National Reclamation Act of 1978, giving full weight to national needs, farming practices, economics, and the continuation of farming as a way of life in America.

Thank you.

WATER RIGHTS

MR. D. E. GRAY
Water Rights Bureau
State Engineer's Office
Santa Fe, New Mexico

Chairman, members of the panel, ladies and gentlemen, we began the workshop with a brief report on New Mexico water rights and administration. On completion of the report, the session addressed questions that were presented by the workshop members regarding water rights and related matters rather than the earlier suggested topics. The participation by the workshop members was excellent. Individual opinions were expressed, and sufficient interest was generated that it was not possible to close on time. It is evident that water rights is a timely subject and the concern of people in a wide variety of vocations. Since the comments were not pursued by other members of the workshop, no recommendation is made at this time, but are brought to the panel's attention for possible further input from the floor. Here are some of the topics that were discussed:

* There was some concern as to whether there was adequate policing to assure that the water user's diversion of water was kept within the limit of his rights.

* One person reminded the group that only irrigation wells in the Roswell Basin were metered and he believed this to be inequitable. Of course, metering is also required in the Gila, San Francisco, and San Simon Basins where the water rights have been adjudicated.

* Possible conflicts of the city-county ordinances and planning codes which restrict population density and water laws which require that water be applied to beneficial use within a reasonable time.

* Some discussion was given to the interstate compacts to which New Mexico is a party.

* Concern that the Federal Government will attempt to override New Mexico's water laws.

* Some apprehension as to the final quantifications of Indian Water Rights by Pueblo and Reservation Indians.

* More communities in New Mexico should require subdivisions and industry to provide the necessary water rights to supply their needs before allowing new tie-ins to the municipal systems.

* Concern about the granting of domestic wells on land on which water rights have been removed and transferred to another place of use. It was referred to as "double dipping."

* A question was raised as to how to provide in-stream minimum flow for fish and recreation purposes in a fully appropriated stream system.

* One person expressed concern over the present statutory procedure in giving notice to the public for a proposed change in point of diversion, place, and purpose of use of an existing water right.

WATER CONFERENCE PANEL DISCUSSION

April 28, 1978

Panel Members:

Mr. S. E. Reynolds, New Mexico State Engineer

Mr. Aubrey Dunn, New Mexico State Senator, Otero County

Mr. Larry Morgan, Administrative Assistant for Representative Harold Runnels, U. S. Congress

Mr. Von Rue Crawford, New Mexico State Representative, Hildalgo and Luna Counties

Mr. Gary Cobb, Director, Office of Water Research and Technology, U. S. Department of the Interior

Moderator: Mr. Jack Coats, Bureau Chief, Las Cruces, The Albuquerque Journal

Coats: I'd like to address this question to Steve Reynolds. Are water or land policies required in order to keep irrigated agriculture viable?

Reynolds: (I'm not sure I understand the question), but certainly, essentially the viability of irrigated agriculture in New Mexico is dependent upon our basic water law. The worst thing that could happen would be for the Federal government by legislation, sanctions, or any means, to attempt to take over or dictate how the states will manage either surface water or ground water. But the problem even among the western states is almost unique to each state. In my opinion, the expertise simply does not exist at the Federal level that could do a better job of managing water in the western states than the states are already doing. I think that since May of '77 and only since then, the administration has come to recognize that. I think this is due not entirely to the administration recognizing the politics of the situation, though that should have been enough, but because Assistant Secretaries Martin, and Forest Gerard did, in fact, come to the West, talk to people interested in water resources, particularly state officials, and <u>listened</u>. They learned from that. I do not expect that the water policy to be announced by the President shortly is going to include a takeover of Western water rights administration.

Coats: Thanks. Larry, do you have any comments in this area?

Morgan: I kind of agree with Steve. The administration has done quite a turnaround on their position on water. The Secretary probably put it best when he indicated that he certainly was not going to

start any new water battles with the Congress this year. He felt he came out with burned fingers last year. The committees made it clear this year that they were going to conduct hearings on all authorized water projects. Certainly we're not going to limit any water projects that had previously been opposed by the administration. Unless there's been a change in the political atmosphere, in the words of Mo Udall, "They felt the heat!"

Coats: Von Rue, do you have anything?

Crawford: Only that we've won the West with water and if we want to lose the West, we just let Washington control our water. The Clean Water Act is a very good example of this. I don't know how many of you are familiar with the Clean Water Act, but this Section 208 that goes into effect October 1st, it's a humdinger; it's a dandy. It has some penalties that are $10,000 a day! If you find that you have faulty water and you fail to advertise it, you can be fined $10,000 a day. It's a bad regulation. So I'm against Federal control; administration should be at state level.

Coats: Thank you. Do you have some comments, Gary?

Cobb: I'd like to make some comments. I, too, have felt a little heat in recent times. (In fact, I may have been sunburned in more ways than one.) I'd agree with Steve and Larry in the fact that Guy Martin and Secretary Andrus are now sensitive to the views of the governors, particularly western governors, with respect to the water policy. Just a week ago, Guy dropped by Governor Matheson's office on Saturday morning and spent 3 1/2 hours talking about the water policy. The only comment that I would have would be that there are recommendations that are evolving in the Administration. The Director of the Office of

Management and Budget as well as the Chairman of the Council on Environmental Quality were also charged in May with developing recommendations for the President. I'm not sure just what that negotiation, that sharing of views will result in. The general thrust of the policy will reflect the kind of sensitivity, Larry, that you and Steve mentioned.

I'd like to outline (at some risk, because this is in a very fluid state right now, a lot of redrafting is going on) where I think the policy will make recommendations, and perhaps, a little of the nature of the recommendations. If I can do that with the recognized caveat that it's a fluid situation, I'd like to share the recommendations with you. (I think you might be interested.)

Reynolds: Is that a copy?

Cobb: Just a draft, Steve, just drafts. I think there'll be recommendations in five basic areas. First, I think that the whole process will have narrowed down, with recommendations related to some 150 issues and options that were earlier identified in the staff process and public hearing process carried out last summer and fall. There may be some 50 or 60 recommendations. They will be in five major areas as I mentioned. First: Planning and evaluation criteria. There's a feeling (and I think it's widely shared by not only the agency people within the administration, but by state water people as well), that we can improve our methodology in preparing plans and evaluating impacts of various alternatives. There needs to be additional effort so that we have, particularly for our direct federal programs, better evaluations and analyses of the various alternatives being considered. I think there'll be recommendations in that area.

There is concern in the administration about the magnitude of the backlog which is authorized. These authorized projects are either not funded, or funded but not completed, in an amount approaching $30 billion, in programs with the Corps of Engineers, the S.C.S., and the Bureau of Reclamation. Now, in any administration, facing up to that kind of backlog in the budgetary process in light of other competing priorities and issues, including energy, is a major problem. How does one do that? How do you select among those projects in the backlog and come forward with the better ones, those that are really most beneficial, from anyone's perception, be it state, regional, federal? We are going to have to improve our methodology in selection. There will likely be recommendations in that area.

Another issue deals with non-structural alternatives, which in the federal programs, at least, have not really been given the same kind of emphasis in the cost sharing policy that have been provided to the structural solutions. Perhaps the same end result could have been achieved in a different way. Flood plain management is a good example. Structural solutions are one approach, but perhaps flood plain zoning, flood-proofing, and other kinds of activities that would be less costly might be more appropriate. Previously, in our federal programs we could not implement non-structural alternatives because there was no federal authority to finance them.

The next area is cost sharing. It is one of the most controversial areas within the administration. It is also one of the most controversial between the states and the federal government. There will be an attempt to get greater consistency in cost sharing policy in the various programs. There is no

reason why the S.C.S. should be able to offer recreational services under a more favorable arrangement than the Corps or the Bureau of Reclamation. One policy ought to apply, for similar kinds of programs, so that there's equity among the programs and no "shopping around."

I'm going to put out something, and I almost hesitate to, but I've been doing it in public statements previously and I'm going to do it again. There is consideration being given to an approach whereby the federal government and the states will share decision making responsibility with respect to selecting new projects to be started out of that $30 billion backlog. The process would involve a program where the state legislatures, on the governors' recommendations, would appropriate some portion of the capital cost of the new project, thereby expressing support for a project in a very meaningful political way. Now the level of that contribution is something that will be debated at length. Rather than the federal government alone taking the responsibility for deciding which projects are to be initiated, there should be a joint process. Better projects would be selected just by virtue of all the state governors and legislatures being represented in the process.

Another area is water conservation. The recommendations here will be to first put the Federal house in order, with respect to water conservation. In our federal programs and federal facilities we have some wasteful water practices considering the technology available to us at this time. So that would be the first step. There also may be a program of planning and technical assistance to state and local governments that would be carried out through the states, recognizing that water conservation

and the implementation of a conservation policy has to be based on state administration and state law. This would encourage water conservation at the state level.

The next area is water quality. There will be some suggestions for improved ground water management: conjunctive use of ground water and surface water, to be carried out through state law. Again, let me emphasize through state law. The role of your state in administering ground water through the water rights permit system and other systems is going to be well represented in the policy.

Minimum stream flow may be considered. I'm not sure what the recommendations will be in that area. The issue is: Could there be recognition of beneficial values associated with minimum stream flow? I'm a Westerner and I know that some of our streams flow only during flash floods. In many cases the minimum stream flow concept has no application to nature; it is contrary to nature. We recognize that. There are, however, situations in some streams in the West that do flow continuously, where maintaining minimum stream flows may have great beneficial value for water quality, ecological balances, and other things.

Another area will be recommendations for improving the coordination of planning between federal programs and state programs, striving for more consistency in the programs. The possibility of Comprehensive Planning Grants under Title II has been very seriously considered. Perhaps a recommendation in that area would tend to strengthen the federal-state planning relationship.

Now the other two areas (where, as you had mentioned, Steve,

the greatest controversy exists) are Indian Water Rights and so-called Federally Reserved Water Rights. I believe that the recommendations will be related to a process of resolution of the issues over time. I am certain there won't be any sort of major recommendation to the Congress for present action of one kind or another that would tend to preempt the role of the state in evolving resolution of this issue. The recommendation will be to lay out a proposed process, over time, where these rights can be better quantified, so that there's a better understanding of what they are, and so that there can be some agreement where there are conflicts in viewpoint. Certainly there won't be any abrupt recommendations for Federal take-over of water rights. It will be more a process of problem resolution, recognizing that water rights administration basically is a state responsibility. I think the recommendations will be substantive, will lead to improvement in water management, and are going to be responsible as well.

Coats: Fine, thank you very much. I'd like to note the arrival of Senator Aubrey Dunn, the old apple picker, and chairman of the Senate Finance Committee. Steve, do you have any comments regarding the administration's viewpoint?

Reynolds: (You invite that at your own risk, Jack). Seriously, these things Gary has addressed are going to be common to a number of these reports and I'd hate to take up the time to give him <u>all</u> the thoughts he had generated on my part. I'll just address two of them at this point and then let the thing go where it will. I would take first Gary's comment with respect to this $30 billion backlog. How do you address that? How do you pick out the projects? You should go ahead but I can't say too much

about how you should do that. I would remind Gary that the Corps of Engineers has a system of automatic deauthorization that has been in effect under Federal legislation for some time. Before any project is "deauthorized" the Congress has the final word. That is essential. Now I can tell you things that you don't do a lot easier. I'll take for an example one that many here will be familiar with. That is the authorization for the Central Arizona project in 1968. This project was authorized after decades of controversy, litigation, and negotiation. It accommodated the interests of the seven Colorado River Basin states. This happened after many hearings before the Congress, the sort of procedures that you are familiar with. Obviously there was adjustment of interests. People had to give up something in order to get something. California made a million acre-feet out of it. Now then, this also authorized projects in Colorado, New Mexico, and Utah, and in both the Upper Basin and the Lower Basin for New Mexico. The principal one I think of in context of the "hit list", is the Hooker Dam and Reservoir. This was on the President's "hit list." He wants it killed! Now then, I think what the federal government does not do. In a situation where the legislation is designed to accomodate the interests of seven states; you don't go in that and pick out one state's project and kill it, and go ahead with the rest. As soon as you start down that path you have absolutely killed any chance of cooperation among the states with respect to water matters, or anything else. That is, if you can reach an agreement, have it authorized by Congress, and then have it torn apart ten years later, nobody wants to do business that way. We wouldn't do that to Mexico; no way would we do it to Mexico. And I don't think we

ought to do it to the sovereign states of these United States either.

Morgan: Steve, could I add a note? Isn't it ironic that we are sitting in Anderson Hall?

Reynolds: You bet! That's Clint's project.

Now, with respect to cost sharing. And of course, as you know, Gary, this business of cost sharing by the states was not specifically addressed in the option papers that came out earlier. The term I hear, and it's attributed to Federal officials, is "front end money." Is that what you are talking about? State "front end money?" The numbers vary from 10 to 25 percent.

Cobb: That's the term I've heard, too.

Reynolds: All right. Now, to me "front end money" means we put it up now. That is the state puts its dollars on the line during those new construction years. Now then, it would be much different, then, if it were a state contribution over a 50-year payout period. The gentleman is here now that can tell me how right or wrong I may be (nodding toward Senator Dunn). If I look at current New Mexico projects, at 10 percent, we are talking something in the range of $20 to $40 million, for projects virtually ready to go. My experience tells me that I might have a difficult time going before the legislature and saying, "Now I want you in fiscal 1979 to appropriate $40 million so that we can go ahead with all these Federal projects." If I instead said, "Well look, we're going to need $40 million over the next 50 to 75 years," they would listen differently. You will probably find this to be true in many of the states. To put that kind of money on the front end is going to be difficult, no matter what importance the state may attach to the project. Let me say this, I also have some trouble with that. For the

simple reason that under existing national water policy, with respect to municipal and industrial projects, and these are the ones that are currently very important to us: Hooker, Eastern New Mexico, Animas-La Plata, those are not irrigation projects, and under existing federal policy the water user is required to repay construction costs, with interest at something a little over 6 percent. By golly, that seems to me to indicate a considerable interest in the project. The difference is a 50 year period. Now, they can't go to the bank and borrow for that period of time. But we think that the United States is planning on being in business for a long time. I think the Federal Government can afford to be a banker and give us 50 years at 6 percent, which is a reasonable interest rate today.

Cobb: What is the $20 to $40 million?

Reynolds: That's what the state would have to put up in "front end money" for projects ready to go.

Cobb: At a what? At 10 percent?

Reynolds: That's at 10 percent.

Cobb: So you have $400 million authorized, say, roughly --

Reynolds: In this general range, depending on what numbers you want to take. That is, just sitting here quickly, and $400 million is a quick figure. You are looking at Brantley at roughly $80 million, looking at Hooker at roughly $50 million. You are looking at New Mexico's share of the Animas-La Plata at roughly $30 million.

Cobb: 160

Reynolds: I think that does it.

Cobb: Well, the other point I'd make is: it would depend on how it

would be administered. Of course construction periods are five to seven years, as you well know, so it may not be $40 million in one fiscal year, but over a few years.

Reynolds: That's right, but I've got to have the committment if I'm going to contract and have the Secretary start on that project.

Cobb: One-third down.

Reynolds: I might have five years to spend it, but I've got to get it this year.

Cobb: The first decision is the one that we'll count.

Crawford: What if you have a situation like Brantley where you are replacing existing Federal Dams, where it's a Federal responsibility, because the two dams represent a danger right now, when the cost of those dams is minimal compared to the cost if those two dams that are there right now collapse?

Cobb: I can see where that kind of situation would warrant an exception to such a policy if it's a replacement program for existing Federal projects.

Coats: Aubrey, I'd like to have the benefit of your comments on this.

Dunn: This particular subject of the state of New Mexico coming forth with this kind of money - you know, we have to be in a position of operating in the black. We have a philosophy of trying to spend the money that we have in New Mexico for projects that we think are very worthwhile and are going to happen. We hate to obligate ourselves to a position on a project or a group of projects just as Steve has described, and maybe we might have some. We'll take the Grants and Gallup and Farmington area, where we really need some money to go in and help those communities grow for the national energy policy as well as our own. If we were to commit $40 million to a group of projects such as we are

talking about and hold back some of these other growth areas which we might really need, and then have this money obligated, unable to spend it, then have somebody come in, as Steve described, and knock it out, maybe we have abolished the possibility of a uranium area or a gas field or some other thing that might grow. We in New Mexico are desperately interested in water projects! We will fund them to the hilt, whenever possible. We've got to do what we can, but we're not going to over-obligate ourselves. We're just not going to do it. New Mexico has seen the problems brought forward in other areas, with other states in the United States. The population of New Mexico may have to carry water a long way, but I don't think we're going to go in debt over our heads. I think that's what Steve would run into if he came after a big hunk of money. We've obligated money for the Ute Dam project. We've put up some for Brantley. We've put up small amounts, as you know, this time to encourage saline water development. But to come up with front money of that magnitude, I think the legislature would be very hesitant. If we could pay it back over a period of time, if we could see the tap open and see the dam or something happen, it would make a lot of difference. We've been grateful to the federal government for many things. (I'm late this morning, thank God, because of the federal government. We worried when Fort Bliss didn't fire missiles). By the same token, people have a real concern about putting that much money up right at the front and then have somebody back off.

Reynolds: Jack, if I might add one further comment that might support my arithmetic. That Eastern New Mexico Project is some $120 million, which I didn't discuss. It's not yet authorized, but it's ready for authorization. If you take all the numbers it is

a very large amount of money.

Dunn: Sure is, and of course we added to that project this year. We put some more authorization up for it because we are interested in it. We considered that in our obligation. We've considered it as already spent. We have to feel that way about it. We can't go for $40 or $50 million at a whack. You know, we're a small state; we can't afford to do that.

Reynolds: Gary, the Senator is talking about a state project, the Ute Dam and Reservoir project. It is essential to the $120 million Eastern New Mexico Project. The state built the dam and reservoir, and this year authorized the installation of gates, in order that we'll be ready to serve that Eastern New Mexico Project. Now, I would hope, that in whatever system was proposed, that kind of contribution would be acceptable in lieu of dollars. A dam and reservoir ought to be considered a contribution.

Coats: Okay, we need to move along a little bit, and before we get to the Saline Water Workshop, are there any questions from the floor to the panel or anyone else?

Floor: What's being done as far as solar energy for irrigation is concerned? In New Mexico and Texas we have a lot of free sunshine the year round, and it looks like we're not taking advantage of it.

Pope: We're cooperating, as you know, with the Willard Project, in terms of the use of the water, not the engineering aspect. Eldon, is there any other work going on?

Hanson: That's about it in New Mexico.

Pope: But that's our major one. We have a real interest in that. Bob?

Coats: Bob San Martin is in the room. Dr. San Martin is Director of the New Mexico Energy Institute.

San Martin: There are a number of ways of where this is being considered. We're looking at solar energy for use as a power source to assist us in delivering water. We're also looking at solar energy nationwide to be used in photosynthetic capture processes for energy production. There may be some applications in saline water recovery. These are being looked at. They're fairly early in the research and development stages, but they're of great interest to the researchers here because of our very obvious natural resources.

After Saline Water Revisited Workshop

Coats: I'd like to point out that there are two separate thrusts of legislation currently in saline water development. The first involving state activities were two successful bills introduced by Senator Dunn in the last session of the legislature this year. Then, of course, in the federal area, Senator Pete Domenici of New Mexico introduced legislation in Congress providing for the construction of four demonstration plants to explore the use of desalination technology throughout the United States. I'd like to ask Senator Dunn now to describe his legislation.

Dunn: Of course, Jack, we actually had about four different areas which we covered in this past session. We submitted Maurice Hobbson's bill to provide a plant in primarily Carrizozo. There was around $200,000 dollars in state money put up to go with $600,000 more in federal money for such a plant in Carrizozo. This plant would, overall, have a capacity of about one-quarter of a million gallons a day by mixing the less saline water with some of the more saline which would come out of the plant as approximately 250,000 gallons of potable water. That $200,000 will go to the

Department of Development who will call for contracts and arrange for additional federal or other state monies or grants (or wherever the money can come from) to complete that plant.

The legislation which I introduced put up $25,000 for a study and $200,000 to go to a plant that could produce as much as a million gallons a day for a municipality. This was called for and the idea was to try to have some of this small amount "front end money" that we talked about at the state level and try to attract the big plant that Mr. Cobb has that was proposed in the Domenici Bill. We are well aware that the local involvement has got to be there. In addition to the study money and other actual money if the project's obtained, the bill called for a 10 percent local match. The idea is that we don't think the state should be the moving force. We think locals have to become involved.

In addition, we set up a $25,000 grant and a $75,000 project to come up with new and innovative ideas and some other methods other than just the known ones and to try to create some new ideas. One of the projects we thought about was the algae process to try to clean up saline water. We're looking for some new ideas. This is practical research.

We also put up some other money in that particular bill for $25,000 for a study and $100,000 to try and find someone to help clean up the water around the uranium areas. Those who have been to Grants know the vast amount of water that is available. Pollution comes off the tailing piles, some as well comes out of the mines. Some of the ideas put forth by researchers in algae feel that they might do something in

that particular area. (I think it's there.) You know, (I'd just like to say - the moving force behind these ideas of cleaning up this brackish water) - I come from the community of Alamogordo, where last year nearly from June through August the people in Alamogordo either were not able to water their lawns at all, or it was every other day. When they talk about the cost of water, the cost of operation of one of these plants, with all the vast acres and acres and acre feet of water, of brackish water we've got in this state of New Mexico, to think that people can't even water a cactus plant in their front yard in a town as large as Alamogordo, shows me that we as a state and as a nation have got to try to promote this type of thing. Sure, we had a pipeline that went out and they are rebuilding it. The water is there, but with the amount of growth that New Mexico is experiencing from other states, if you don't even count the industry growth or anything like that, it seems to me that we're foolish if we are not the leaders in using saline water. I hope that this legislation which we've been involved with will promote saline water development. The water is here, the brackish water is here, I don't need to tell you people of the vast amount of water that's in that basin. If you don't interfere with the military, and there is no way that there's any problem of interfering with them. There's plenty of semi-saline water. I just wish we'd get on with the act. I hope that the Federal government will come through and help us with this small amount of money we've put up and come out with the plant, because there's no reason that we can't take this amount of water and make it potable water. We're ready to go; the technology is there and I think that we

need to get on with the show. Because one of these days - even right here where we sit there's plenty of water, but if we keep using it for irrigation purposes such as we have here, and your growth continues, you are going to have a water problem in this area. Now we over there, I was born and raised in Alamogordo, and I know what it means to have rationed water. (I live in the mountains now, where I have plenty of water and it's wasted and all this type of thing). I happen to believe in the preservation of the water resources we have, we've got to clean it up. I hope this legislation will get it started.

Coats: Thank you, Aubrey. Gary, can you fill us in on your activities in connection with Senator Domenici's bill?

Cobb: Yes, I was out here about three weeks ago, and Steve and I went over the State; we went to Alamogordo and met with people from Tularosa. So I'm getting a better feel all the time, Senator, of your interests. There's no doubt about it; there's a great potential opportunity here for demonstration activities that can be very useful to the program and can help the nation as far as technology is concerned. I'd be remiss today if I didn't share with you a little bit of a sunburning that I also took in my own program - not on water policy, but in the desalination area. When we requested guys like Steve Reynolds to help us identify potential demonstration sites, we attached to our letter, guidelines outlining the role that the Federal government would have in planning for a demonstration and implementing a demonstration, and the role that the local communities would have as an integral part of the process, and I'll elaborate later on why we feel that way. In any case, I sent out a letter with the guidelines

attached. In our guidelines we suggested an objective in cost sharing of 50/50 based on a flexible policy that would allow the Secretary to have discretion to take into account the capability, both financial and technical, of the cooperating community. Suffice it to say that our guidelines were of a great deal of concern to the states. I made a mistake in my letter by not indicating that the guidelines were based on the Administration's new proposed legislation. That was implied, but I should have stated that explicitly. As a result, our intent was misinterpreted. From the point of view of the states, I can well understand that. In any case, at the hearings we had before House subcommittee on Water and Power Resources, I would describe it as a broadside. Every member of the Committee came at Guy and me like gangbusters. They got our attention, to put it mildly. It was clear from those hearings that there was a real misunderstanding of our intentions. The Committee had the feeling that we had issued, and were going to implement, cost sharing policy according to regulations that were inconsistent with existing law. And, of course, we know in a former administration that that happened a few times. We were very chagrined that that interpretation had been made, even though it was not our intention at all. In Senate Committee the next day, before Senator Domenici, Guy and I had a little more to lay out how this had evolved. Quite candidly, last summer, when the existing legislation was approved by the President, Guy was not into this program, had no input into the bill that was passed through the administration and signed by the President. Guy's and my own participation in the

in the programs was developed in late August and early September, in preparation for oversight hearings last fall, which were very well received.

This Administration is committed to moving forward with a responsible saline water program. That is a committment not only in spirit, but also a committment in terms of resources and budgets. The process that we followed last Fall in evolving the program was first to outline new objectives that we felt were apppropirate to the program, including the roles that the Federal government, the state and local interests would have in demonstration activities. We presented those to the House Interior and Insular Affairs subcommittee on Water and Power Resources - all were well recieved. Following up on our committments at that time we reprogrammed activity in the current fiscal year to initiate demonstration studies. There were no appropriations even for demonstration activities. We reprogrammed, or proposed reprogramming to the Appropriations Committee, to do that. So we took the initiative, to initiate the activity. We, at the same time, had a substantial amount of unobligated carry-over in the program coming out of the past fiscal year, simply because the <u>will</u> had not been there to have a program. We applied that unobligated carry-over of no-year money, you know, continuing appropriations, into our '78 and '79 programs; we redirected our budget request on November the first. It went through OMB with no change. So the program that was in the President's budget was the program that was proposed by Assistant Secretary Martin and me. OMB had no involvement, they approved it <u>in toto</u>. First time it's ever happened to me in 18 years, probably will never happen again! But in any case, we put that program through,

and so we feel that that reflects our committment to the program. The appropriations are presently being considered in the Appropriations Committees, as I say. We had authorization hearings on new organic legislation for the program. We had a broadside, but there's been give and take since. I wrote a letter to Steve and others I had previously written, extending the time period, clarifying our position, and indicating that whatever policy the Congress approves in its actions now will be implemented, without equivocation. So there is no Mickey Mouse at all about our intentions. We're going to implement the policy that the Congress approves in the current process with respect to cost sharing, and also with respect to the whole program. I wrote Congressmen Lujan and Runnels. The Secretary responded to a letter from Congressman Lujan, which made it very clear what our intention is. That was two weeks ago and the program is back on the track. I feel good about it. We're going to have good appropriations, but I'd like to go down through just a couple of points.

I want to commend you, and compliment you, Senator, for the initiatives you've taken in this state. There is no other state, yet, that has, at the state level, taken the initiative in response to this saline water program. There are other states, frankly, who are very interested, and other local communities. There has been an indication on the part of some communities of willingness for a substantial amount of participation in the program. This is the first state, though, and the only state to date, that has taken an action.

Crawford: Can you cut off the application date now?

Cobb: June 1 is the application cutoff. One expression of interest is public knowledge. It was presented in testimony before Senator Domenici; that is Virginia Beach.

But let me just hit a couple of other points related to our program. The point about waste energy or low temperature energy coming out of say, a hookup with thermal power plant. We have a joint project with the Israeli government right now. There is $20 million AID money, $30 million of Israeli money, to advance a technology in distillation that had been developed in Israel called multiple-effect process, as opposed to the multiple-stage flash and other processes that we have in this country. That multiple-effect technology adapts itself to low temperature applications. Multi-stage flash is 160° Fahrenheit on up. This thing will operate at under that, clear down to 110°, 100°. It has great potential if you could take that waste heat out of a thermal plant. So you've got zero energy costs going in. Think what that would be to this technology. The joint agreement that we have with the Government of Israel, administered through AID, provides that the new technology that comes out of this joint program shall be available to the United States government and to public interests in this country royalty free. So, it's coming. That program is in the early design stages. We're not in the construction stage yet. There will be a plant of five million gallons per day as a first module, to be scaled up to ten million gallons a day. The program will be over a period of about seven or eight years. We can look forward to that technology being available in our program.

I wanted to mention, too, that we're now in the process of

negotiating a joint agreement with our Roswell Test Facility and the water center here. New Mexico researchers will use the Roswell blending capability to advance study of saline-resistant crop varieties. I'm very hopeful that that program will go forward. That agreement offers real opportunities.

I've got to respond, frankly, on the point about how the $300 million to date was spent. In fact, much of that $300 million was spent on hardware in distillation. It was not all research. Perhaps that was what led to the former administration and the OMB position that we ought to phase out the distillation technology. There had been so much hardware put in place that didn't work, that we tore down. We tore one down, I'm told, at Roswell, a demonstration plant.

It was not there when I went there, so it went somewhere. I have a demo plant that's sitting out in Orange County. What do you do with it? I'm still trying to find a way out of that problem. So it's for this reason that we felt that the demonstration activity was the most critical and sensitive in the program. Our philosophy and our approach, very simply put, is this: We believe that we ought to carry demonstration activity forward from a point of view of water problems, not technology. We should address a real world water problem. We should make the demonstration an integral part of the water management system for that problem. Then we should have participation, technical and financial participation, and committment of the local participants in the program. This would ensure that when we get the data out, we can turn the whole thing over. Now, that's another point that's not well understood. We would turn the whole project over to the local community and

it would be their project, without additional cost. It would be an integral part of their water supply or water treatment. They would know how to operate it because they would have been in it up to their eyeballs from the time of the very, very early design studies. That's our approach. We don't want to tear any more demos down. We don't want any more white elephants sitting around. We want operating demonstrations. Apart from the money, apart from who pays, I think it is very important we have that kind of committment. We want to step out in four or five years and leave it there, not as a white elephant, but as a continuing demonstration.

Now what happened to the $300 million? I'd like to share that briefly. We spent $300 million developing a distillation technology, a lot of unsuccessful demos. When the former administration in 1973 closed that program down, the profit centers in industry that had built up around that $30 million appropriation per year dispersed. The energy crunch came. The Saudis and Kuwaitis got rich. Our patent policy and our public policy at that time was to put all this technology in a row of green books that covers two bookshelves ten feet long. The Germans, the English, the Japanese picked up our technology. They're now over there selling the plants. Now that's something to think about. We developed it. It's our technology. They admit that they're using our technology, and they're selling the plants, and we're out of it.

Where can we make it? We can make it in reverse osmosis. In membranes we're out ahead. I was in Tokyo last fall at their seawater lab. They were testing Dupont and our PA 300 membranes there. Yes, they had a couple of Japanese membranes

but we're still first there in R.O. In our program's thrust we're pushing very hard to maintain the lead. In this area we have the advantage. In the distillation area, through the joint program we have with Israel perhaps we can get our industry back into it. It's going to take a major committment on the part of industry. It's not just government; it's industry and government that are going to have to make a committment to try to capture some of that Middle Eastern market. In my view, we shouldn't pass over too lightly the great opportunities for this technology in our country, in areas like the Tularosa, in areas like southern Florida, in areas like Virginia Beach, in areas like the Virgin Islands, where there simply are no other alternatives. Cost is relative, if you don't have any other alterative. They're barging water into the Virgin Islands right now. The cost is in dollars per gallon, not dollars per thousand gallons. It's almost like bottled water. If you deal with a situation like that, then this technology makes sense. But it also makes sense in our country in water reuse. These membranes and what we can do in our pretreatment activity and blending back have potential in water reuse. There is great potential application in the whole country in a variety of industrial activities.

Coats: Gary, will New Mexico receive one of the four pilot plants as proposed?

Cobb: I'm issuing a request now for AE's to come and help us evaluate pro-

posals. Of course, I am the director. There will have to be a first one somewhere and we're going to do four of them. We're going to stage out the four of them in a four year period. Let's just say you're very competitive.

Morgan: You know we were talking about the lack of clout in some cases. This is one area where New Mexico is in a strong position. We've got Senator Domenici on the Senate side of the committee; Congressman Runnels is on a leave of absence from the Water and Power Subcommittee; there is a possibility he is going to be chairman of either Water and Power next session or Public Lands, one of the two. Congressman Lujan is the ranking Republican on the Water and Power Subcommittee, and he (Gary Cobb) felt some of the heat last week from this committee because they are very dedicated towards saline water research. They've made it repeatedly clear in the past. Past administrations, for example, have been trying to close down the Roswell Facility in past years, every year for the past 8 to 10 years, and we have repeatedly crammed it down their throats.

So you could say that the committee is very dedicated to saline water research, and I don't see any let up on that in the Western states in particular.

Coats: Von Rue, do you have some comments on that?

Crawford: Yes, just on the Roswell Facility. We had a bill which I co-sponsored last time for $200,000 for that facility for WRRI to do some testing there.

Cobb: And is that work going to go ahead? Do you have the money?

Crawford: The bill got lost in the shuffle, but I intend to reintroduce it this time.

Pope: On the agricultural side, we're going ahead as far as we can with

the resources we have, and come back next time.

Cobb: I'm really excited about that project.

Crawford: The bill, nobody's against the bill. It just ran out of time, but I think we can pass it in the next session. I intend to try. We flew over there and we toured the facility. There's a lot of opportunity there, for testing different crops.

Costs: Thank you. Steve, do you have some comments?

Reynolds: I'd like to make just one. People seem to forget, even in New Mexico, that water is dirt cheap. If I put a half an acre foot on my yard and garden in Santa Fe, it's going to cost me roughly $500 bucks. But if I tried to put a half an acre foot of dirt in my yard it would cost a lot more than that. We need to think about that.

Coats: Thanks. Aubrey?

Dunn: There's one other point that I'd like to make with regard to what Mr. Cobb said. You know, you talk about getting private industry into this thing, and everybody knows I'm pretty hard-rock conservative, some people say. We have private industry working on supplying utilities. We've got private industry working on all of our gas, all of our nuclear energy, all of these other things, but this is one role that government can do. Government can provide water to municipalities. This, to me, is one thing government needs to be really involved in deeply. Local government and state government, nobody wants to touch a water system. I don't blame them. I belong to three little water co-ops. It's expensive. But this is one role that government can really perform. We can burn wood to keep warm with, but drinking water we've got to provide from the government, whatever level.

Cobb: I don't disagree with that. My basic point was to try to capture some of the Middle Eastern market, to get back into that. I think we can help a lot by trying to bring seawater membrane processes up to a point where they work and performance can be guaranteed. But try to go back and reenergize, if you will, a heavy R&D program in distillation in this country - research, yes, but I've got some real questions in my mind about the developmental aspects of it, because it's a commercial process. The Japanese are building those plants right now, and so - sure we can prove it - but I don't think we have to demonstrate it anymore.

Crawford: Did you say we spent $300 million?

Cobb: $300 million on saline water. The Office of Saline Water. The program was created in 1953, and from 1953 until the present time we have spent over $300 million in saline water.

Morgan: That includes the Yuma project?

Cobb: No, that does not include the Yuma project. That's $200 million itself.

Crawford: That's one of the sore points with us. We've spent more money to create saline water treatment for Mexico at the Yuma project than we've spent in our own nation. We're sending treated water down to Mexico right now, and we don't have a major project here in the United States.

Coats: Thank you, Larry. Any questions from the floor?

Floor: Most all of the discussion on saline water has been in terms of large capability. Has there been any research in terms of small, independent types of projects, such as is taking place in terms of individuals in solar type of activities? Is this a feasible

possibility, of small distillation type of saline projects?

Cobb: In my opinion, yes. I mentioned water reuse. Let's take the blowdown process, in electrical generation, on the Four Corners plant, for example. I'm aware of what's going on there. So this technology has all kinds of different applications. The membrane technology, particularly, is adaptable to scale. There are little units, big units. We have little units operating right now at our test facility You might want to go out and look at one of them. They are pipes about ten feet long and they are putting out water. You can see it.

Morgan: The military, also. Senator Dunn and I were over at Holloman yesterday and one of the things they were showing us over there was their mobility kits. And they, for example, have a package less than the size of this table that will provide water for a complete battalion. Drinking water, only, but I mean it's just in a little package, and it's a reverse osmosis system.

Coats: Any others? Dr. Steinhoff?

Steinhoff: I think there's one area which in the last year has shown substantial progress, that is the desalting of the tail waters of irrigation. I think for the first time in history we have succeeded in taking more salt out of the tail water than the irrigation carried with it. This is the limit, a major danger, which saline waters are subject to, say, a salt test of agriculture occurs. And this is that first time in history that it is possible to do that. And this is, I think, a benefit of desalting in these areas and it has been demonstrated in California.

Coats: Thank you very much. That was Dr. Steinhoff with the New Mexico Research group out of Alamogordo, who is doing much of the work at Carrizozo right now. Additional questions? Yes, sir.

Floor: I was interested in hearing Mr. Cobb say that the Department of Interior was not interested in administering the water resources of the states. I know it's too bad that EPA and OSM and OSHA and HEW and other government agencies do not have the same philosophy. But what I really wanted to say was what I mentioned to Dr. Bahr this morning. Something that's greatly needed, is for detailed hydrologic mapping and study done of the water resources of the state. You can go to the USGS and other places and get some sketchy data, but now there are a number of us in industry that would like to use brackish water, but we really don't have the data necessary to go into a brackish water area and spend several million dollars developing it. We don't know how much is there. We don't know the porosity of the formation. We don't know the chemical analysis of it. So this needs to be done throughout the state of New Mexico. I don't know whose responsibility it would be, or where the funding would come from, but this is something that is greatly needed.

Coats: Thank you, sir. Any comments?

Reynolds: I'd like to offer one comment to that. To add some encouragement. Quite recently my office made application to Sandia Corporation for about six million dollars to help us get precisely the kind of information you are talking about with respect to the San Juan Basin. There is some reason to believe that they may come through. This would be very helpful. Getting the kind of detailed information that you express the need for, as you know, is expensive, whether you have to do it, or the state or the Feds have to do it.

Floor: You have to drill test wells, and you have to pump them for months if not years, to obtain this data.

Reynolds: In the final analysis that's what you must do. It's all you really want.

Energy and Water, National Water Policy, and Water Rights Workshop reports followed

Two questions from the Energy and Water Workshop were addressed by the panel:

1. What are the panel's feelings on the order of energy alternatives?
2. Should we have a state energy policy?

Coats: Aubrey, would you like to start off some comments?

Dunn: A state energy policy, as we speak of it, depends on who you talk to, Jack, as to what kind of policy you are talking about. If we were to have a policy that we would have "X" power plants and where these power plants were going to be sited. Are we going to have so much nuclear power generated in our area? Or are we going to use natural gas in a certain area, or is one town going to have natural gas and another town not? If that's the energy policy we're talking about, we're going to decide or have a group of people sit somewhere and decide, that this area of the state will develop and that area of the state won't develop - this guy owns this private land and he owns so many water rights and he has so much land. You know that our country is founded on the right to own land, and New Mexico and the West is founded on the guy that has got enough water to drink. To say we are going to have a set policy is easy to say, but we are a long way from that, in my opinion. We are a long way from having the togetherness or the urgency or the crisis to generate this type of set policy, and to say where energy is going to be located -

we're not to that point yet in New Mexico. We are a few over a million people. Unfortunately almost 70 percent of them are located between Belen and Santa Fe, not by accident, but because that's where the water is. The energy is developed of course, as it goes to the southeast and the northwest, and that's where the energy is. We're not going to be able to say that we can stop these trends. We might be able to come up with some idea or, add to some suggested ideas. For instance, if we could create energy in the Tularosa Basin by using brackish water to cool the generators, maybe that's something we need to look at. But by the same token, the very economics and the great things of national defense happening at White Sands Missile Range and Holloman Air Force Base, they are very important as well. To say that we're going to set a policy that energy development can only be in a certain area is something that's hard for us to do. You know, these are things that I can't say as a legislator, "Yes, we will have a policy." I don't think New Mexico is developed to that point. This is an area in which we are going to have to feel our way, and we can make suggestions. If we develop saline water plants that will make potable water in arid areas of New Mexico, and shift some of this population growth from all going up there in the Albuquerque area, we may be able to prevent some of the social and other problems that are associated with large metropolitan areas similar to those in the East. If we can spread population growth out around the state, that will solve some of our problems. By the same token, when you do this you will move some of the energy needs around and you can solve some of that. But today, we don't even have anybody in New Mexico that has made a suggestion of how much natural gas we will need in

Las Cruces, Deming, Lordsburg, Alamogordo, and other parts of the state in 1985. Nobody can tell us, so how are we going to set an energy policy, much less how to get it over there. We don't know how much we are going to need in those areas. So, I say a policy is a long way down the road.

Coats: Fine. Von Rue, do you have any ideas on a state energy policy?

Crawford: I like Destin's idea over there. He says we've got the energy, some places have the water; all right, we'll trade you some of our energy for some of your water. You bring the water over to us. No, I agree with Aubrey. I think we are a ways away from a state energy policy. The Fed's don't have one, I don't know why we should be any different. Aubrey made some valid points. We don't know what our priorities are going to be. We really don't know in Deming, New Mexico today how much gas we're going to need in 1982, 1985. We don't know how many people we are going to have there, how much industry, and I think it is the same all over the state. Too much of our population is concentrated in one place, maybe Bernalillo County needs an energy policy, because that seems to be where 40-50-60 percent of the people are. And the energy, of course, is concentrated in the Four Corners area, San Juan County, and also down in the Hobbs, Lovington and Carlsbad areas. I do think we need a water policy. I think the next session of the legislature should be giving some thought to where we're going with water. I do think we need an interim committee to study water, to say, "where are we going?" It's tied so closely to energy. The two are just completely overlapped. You can't talk about one without the other. Any time you get into energy, you get into the question of how much water it's

going to take, and how much water is there? So I don't think, Jack, I really don't think we're ready for an energy policy.

Coats: Steve?

Reynolds: Well, I feel obliged to comment on what Von Rue has said with respect to water policy. There it is (holding up volume containing water statutes) - established by the legislature. With a little more over in the constitution, which is not included here. And it's a pretty good policy. It'll work, with respect to energy problems, and all the others, I think. There was an interesting point made in Bill Lorang's statement, that is, are you giving consideration to energy alternatives, including the amount of water required for the various alternatives. I just happen to have a few numbers in mind. First off, if you do coal slurry, you'll take about 800 acre feet per million tons of coal. If you want to do coal gasification, that's going to take about 900 acre feet per million tons of coal. If you want to do electric generation, that's about 5000 acre feet per million tons of coal. Now, you can think about the number of jobs that are related to those various uses of caol, and that's very important. Not many, with respect to coal slurry; it looks like the greatest number with respect to coal gasification, then an intermediate number with respect to electric generation. I think that you have to think about those jobs, particularly when you bear in mind that the preponderance of our coal resources are up in the northwest corner, on the Navajo Reservation, where you have roughly 70 percent unemployment. So when you're setting energy and water policy, keep that in mind. Now, you raise serious questions, some of which have been raised with federal legislation with respect to coal slurry quite recently. Is the use of water to slurry coal to Texas

beneficial use under New Mexico's constitution and laws? I have not reached a conclusion on that, and I'm not going to, I think, until we have a specific case before us. Keep this in mind. If coal slurry is a product, that is, not water and coal, then I don't think our constitution and statutes prohibit use of water to slurry coal to Texas. But if you looked at it as not a product, but as water and coal, you have serious questions, whether that could be done under our law. Now if you look at it as a matter of policy, if the only way you can, and I use the word advisedly, exploit, Navajo coal resources, for example, is by coal slurry, if you can't do it by gasification or electric generation, and there's reason to believe that you can't go much further than you have, then, by golly, I think it may well be in the public interest to use our water to slurry coal to Texas. Keep in mind that the royalty, and I don't have any recent real firm number, but you know it's something like 50 cents a ton. For a million tons of coal, that's five hundred thousand dollars, and I don't know many farmers that make anything like that out of 800 acre feet of water. I think those are the kind of considerations you need to make when you decide about coal slurry and so forth. We're afraid of one piece in the Federal legislation that would give the states general power to determine their use of water for coal slurry, but there's one little provision in there that says that the U.S.G.S. could override a favorable state decision, and I don't think we want to let that go. The legislation is not passed, and I think that'll be taken care of. It's just that first little toe-in-the-door for Federal control over that question.

Coats: Thank you, Steve. I know that you mentioned coal gasification, but you did not mention coal liquification. Is there any particular reason?

Reynolds: I don't have any numbers.

Coats: Okay. The second question posed, and this has to do with the order of energy alternatives, and Bill lists these alternatives: conservation, weather modification, ground water recharge, reuse of waste water, pump storage, recovery of evaporated water, use of waste heat, legal problems, use of non-water intensive energy sources. Should we prioritize these alternatives, and if so, how would we go about it?

Crawford: They are all priority, every one of them. How do you start with one and go through ten.

Morgan: There's no way, really.

Crawford: They're all number one.

Morgan: And they all create their own problems, and we were talking the other day, Steve and I, about water reuse, and we were saying that there is a possibility that there is going to be court suits in the fact if a community starts reusing its water, sewer water, instead of dumping it into the underground aquifers of some type, some place downstream may start suing you because you are not sending them as much water as you originally did. "Water Rights" is fightin' words in western states.

Coats: Aubrey?

Dunn: There are all kinds of problems as you go down those particular areas. How do you put a priority on them? I guess my first priority would have to be conservation. I think that's one of

the main things to put - and I think the law says that. Our law says to put it to beneficial use, it said that years ago, and that's conservation. That's what it is. Use it in the best beneficial use and conservation - I'd say that's what has to be at the top of the list. To waste it, with what it's worth to all of us, those of us that have seen pipelines go sixty miles, and see a little piece of black hose that runs out across the desert to create a little pool out there for a cow to drink out of, you know that's conservation. That's beneficial use of that water. That to me, that's just the top of the list.

Coats: Gary, do you have any comments?

Cobb: Not on these points. I've got some comments later on.

Crawford: Jack, can we go back to what Steve said about we have a water policy. I'm sure he is referring to the water rights laws. Don't you think there's some that actually get around those laws? For instance, a farmer in Luna county has a water right. Someone wants to move a half a mile away, drill a well. If you turn him down, he'll take you to court, and he'll win, unless you can prove that he's going to lower the water five feet a year or four feet a year.

Reynolds: There's a very important difference. He has to prove that he will not impair other rights - I don't have to prove that he will. That is a very important difference.

Crawford: But isn't this happening?

Reynolds: We don't lose many. They take us to court, but in the last 23 years we have appeared 55 times in the Supreme Court, and our record is about 85 percent.

Coats: Fine, thank you, Von Rue. Now the report on National Water Policy, and I feel Gary probably has a few comments.

Cobb: Before we do that, I did have a comment on Bill's report, and that is on getting the research out, I wouldn't let an opportunity go by without plugging our program. Our program is the only Federal-State partnership program for research in the water area in existence. The EPA has some big Federal labs out there, but we have centers in 50 states and four territories that are in partnership with us. We're putting a new element in our new legislation that will let $750,000, to create an opportunity for these centers to take research knowledge not just out of our program, but from anywhere in the world, and apply it to your problems. We've got a fancy term for that, we call it technology transfer, but what it amounts to is making that center a focus in the state for water research from all over in the world, so that they can help bring that knowledge to bear. I want to plug these centers hard. They are important. They are the only Federal-State partnership arrangement in this game in town. So, I've got to "pitch", Tom.

Cobb: Now, on the water policy. There's a game I play sometimes when I'm trying to draw people out, I say "What would you do if you were King? (laughter) If I were King, and the way I understand your recommendations, I would adopt them. Let me elaborate just a little bit on how I understand them. I agree that the states have the primary authority and responsibility in water management. I think many in the administration feel the same way. The role of the Federal government should be to provide assistance to the state programs to meet state needs. Therefore you ought to take Henry Caulfield's model and start playing with that a little bit.

We ought to abolish the Corps, SCS, the Bureau. We ought to create a new agency that would provide assistance to water priorities and management to meet state needs. Our direct Federal programs are coming around, because they are beat over the heads by governors all the time. Look at Caulfield's stuff, at Colorado State University. He's got a model, for instance, that is quite different. State and regional programs should be weighed more, and not just on national grounds. At the same time, I would add the ability and the willingness to pay. So you've got to play with cost sharing a bit more. If you want to meet your needs, you're going to have to find ways to finance them more. You can't have all states and all regions going at the Federal government trying to say, "Meet our needs."

Senator Domenici has said that there are 24 or 26 states that are operating with surplus budgets. The Federal government right now is running sixty billion a year in the red. And, he said, that's something to think about. So cost-sharing and the Federal-State role is something we've got to think about. The old stale tale that the Feds have all the resources just doesn't hold up, according to Senator Domenici, and I agree with him. Federal actions must be consistent with those of the states, sort of a joint program.

Next, there must be continuity, coordination, and flexibility.

I already spoke to Federal project financing. If you want to pursue the interests of the state, then you've got to be willing to compete more, pay more. That's the way I feel about it.

Federal supported water research is good. Through a program like ours, you can build on research that's being carried out in other areas. I don't think we ought to decentralize research. It would be too redundant. We need the research carried out where the expertise is, in the states and the universities. But you need a program like we have to coordinate that and eliminate the duplication and help to meet the objectives. It's a partnership role, with the Federal role being one of pulling it all together, and also looking at major problems of national significance. Not all problems are so pervasive, or so extensive that they become issues of national significance.

Of course, the water rights would be administered by the state, and would update the reclamation.

So, I'd buy it if I were King.

Well, what are we going to recommend, I wonder, that will violate this? Is it levels of cost sharing? What are we going to put into our policy that will violate this?

Let's run the President's policy against this point-by

point when it comes out. I'm going to do that and see how it shakes down.

Morgan: One word in there that I think they may be nervous about. Indian water rights, and of course, that's one that's confronting Congress.

Cobb: Yes, I see that as a Congressional issue.

Morgan: I don't see any great desire on the part of the Congress to attack that issue, truthfully. There's been legislation introduced by Conbressman Mead, Chairman of the Water and Power Subcommittee, but he hasn't even scheduled his own bill for hearings. I don't see anything coming up on it, not this session, anyway.

Crawford: I have trouble with number five. Those three words, I have never seen in connection with any Federal program before: continuity, coordination, and flexibility, all in one sentence.

Cobb: You have to start disaggregating it a little bit. I've been around this thing quite a bit through the (federal Water Resources) Council, so I know how the states feel. The EPA's heavy regulatory approach in water quality is very troublesome to most states, particularly western states. The President's water policy is not going to attack that. You are going to say, maybe, we sin by ommission. I think we may have to take a rap or two on that point. Because the balance of planning and regulatory approach to water management was brought home to me in the recent conference we had where we compared the Thames in the United Kingdom, and the Potomac. In the United Kingdom they approach water quality management quite differently than we do. They say first - what is the effect of contaminants or pollutants in water on people? What is the body of evidence that it has any

health effect? If there's no health effect, they don't worry about it. If there is a health effect, they say, mitigate it somehow. Mitigate it, try to ameloriate that effect. If you can't do that, then try to start backing up to the source. Now there are certain minimum standards on effluents. The point is, we have a strong attack from both the cause and the effect, and it may be costing us a lot of money. I would defy anyone to prove that the people in London are dying at an earlier age than the people in Washington, D.C. because of water. So there's a lot to be learned about the different ways that people do water business around the world. Just because we do it one way doesn't necessarily mean that's best. I don't suppose I'll be very popular with the Administrator of the EPA if he picks up these comments, but Congress has to step forward and take some responsibility for the way we manage water quality in this country. Whenever we tried in the Council to bring a better planning approach or more flexibility into the water quality area, (Public Law) 92-500 was cited as absolutely legislatively mandating! The poor administrator's hands were tied and he couldn't do anything except implement by '77 and '83.

So, it's not just all one side or the other. But I like this policy, and I'd like to run the President's policy against this, point by point, and I'm going to do it.

Reynolds: Perhaps I'd better preface what I'm going to say with background knowledge. If nobody has realized it, I'm over 60, and I've found out that the older I get, the more I'm apt to defend the status quo. To guard it! With respect to Henry Caulfield's model, under which we'd dismantle the Federal water agencies and let the states do this, I think it's very important that the people of New Mexico realize and recognize that the Bureau of Reclamation, Corps of Engineers,

the SCS, USGS, have all cooperated beautifully with each other, and with the state, and since 1955 we've had roughly one billion dollars worth of projects, either completed or authorized for construction in New Mexico. If that were to be dismantled, we're going to have to reproduce that in each of the western states at least.

Cobb: Now Henry went further. He said re-mantle with new objectives and a new role.

Reynolds: Never mind. If you duplicate that engineering expertise in each state, you're in a lot of trouble. I think it is in the interest of this state, any other western state, or in the national interest, not to dismantle, but to enhance, the activities of those Federal water agencies.

Cobb: I want to come back. Caulfield said, "and reconstitute Federal agencies that could better serve the needs of the states." He would not disagree with your point, and he can defend himself, but I will defend him to the extent that I understand the case. He would not try to create the engineering effort in 50 states, but rather feels that that, because of economy of scale and efficiency, is a very legitimate role that could be reconstituted in a Federal program. I think that what you have said and Henry's proposal differs in the extent to which states impact the decisions on the projects that go into place. Now I think that the Bureau and the Corps, particularly the Corps through its "fishbowl planning," have become much, much more responsive to the views of the states and the locally affected publics, and the alternatives that are developed. But nonetheless, a project must then go through the review process, which involves the Office of the Secretary of the Army, involves the Office of

Management and Budget, (and I was in there for three years, right in the line, I know exactly what we were doing), and to the Congress for final action, and in that process, there are many other decision makers, bringing their views to bear on the exact nature of the project. Maybe those billion dollars worth of projects, maybe they wouldn't have been in the same form if they had been projects that were more appropriate to the objectives of the state viewpoint. I think that's Caulfield's argument. It's the decision making process and the sort of historical role, that the Federal agencies have had. I would say that in California, if I were to go out there, and Ron Robie were in your chair, he would say, "We have got our problems with both the Corps and the Bureau."

Reynolds: But this is important. No Federal agency, at least for the past 25 years, has ever tried to build a project that is not precisely what the state wants. And I can tell you this from the politics of the situation in New Mexico, there is no way that a Federal agency could get a project authorized that the state doesn't want. No Federal agency comes to New Mexico and tries to jam a water project down our throat. No reason why they should try it in California.

Cobb: I've never known of a project that was authorized that the Governor opposed with the exception of one. But I'm talking about the degree of shaping of these projects. It's a matter of degree.

Reynolds: They work with us, day by day, week by week, and shape those projects to precisely what the state wants. This is a primary function of our Interstate Stream Commission, to see that Federal

projects are that way, and we don't have any trouble with it. Sure, we come up with suggestions now and then, they can explain to us why that's wrong and we say, okay, so that's wrong, so let's do it this way. We view the Federal agencies as working for the State of New Mexico, and I think they see it that way, and I think they like it that way. They are just as much our servants and part of our water staff as the people on the state payroll.

Morgan: I know we use them to help us draft legislation, the Brantley Dam was an example, which was Harold's very first bill.

Cobb: How about EPA, how do you get along with the EPA?

Reynolds: Recently, much better.

Cobb: Well as you can see, water policy is very interesting, and people have different perspectives about it. I can appreciate your comments, but I think Henry Caulfield has some wisdom behind his view, too. He represents 35 years of experience, and thinking about it.

Reynolds: And he reserves the right to be wrong, just as I do.

Dunn: I'd like to comment on another area that hasn't been mentioned, and that's the severance taxes on exports, and whether or not any money created from that should be put back into water development or what-have-you. We're doing that somewhat already, for example, the gates on the Ute Dam, the severance tax on Brantley Dam. What front money we've put on that has come from severance taxes. I'd like to point out that this relates very directly to cost sharing, cost sharing with the Federal government. I'd like to use an example. We put on a little tax on the electricity generated in New Mexico, and folks in California and Arizona got rather upset, and some of the Congressmen took it to Congress, and

they've taken it to court, and so far we've won each time it has come along. This same money that is generated from electrical generation, goes back into building roads in the northwest corner of New Mexico, where the coal and the uranium and the gas are, which is national policy.

My point is that we're hampered, and we're going to see more of this, if the state doesn't react quickly, and put a severance tax, or some kind of tax on our natural resources that are exported or used, that go into the national economy. If we don't do something about it we're going to be preempted by the Federal government, and we already are. So we talk about what should cost sharing be, and if we are going to talk about building a water desalinization plant for $10 million, and we have to put up $5 million. I'd like to just point out in the area of natural gas, if the bill passes that is now before Congress that is supposed to be the solution, the great compromise, New Mexico will be prohibited from future taxes on natural gas. If that happens, there goes our wherewithal to put up this cost sharing. There is even the possibility that if they don't get it straightened out, we may lose what we've already put on it, which is absurd. If they've ever had a gun to our head, that's it. At this point, we may lose the severance tax that we put on in 1977. So when we talk about cost sharing, what New Mexico has is clean air and brackish water, and a little oil and gas and uranium, and then they prevent us from using that right there, it's a real problem. Keep this in mind when they talk about cost sharing. They, in effect, take what we have. 90 percent of our natural gas is going out of state or is used as electricity out of state, and we are prohibited from putting

a tax on it to develop the other things that we do not have, so cost sharing is important.

Coats: Thank you, now the last workshop report, Water Rights. There was some concern as to whether there is adequate policing to assure that water users' diversion of their water was left within their individual water rights.

Reynolds: That's difficult. We do find a number of violations. We do something about it. Now, whether we find them all, of course, there's no way for me to be sure. Policing, of course, costs money, in addition to being sort of an unpleasant activity. At this time I think that it is reasonably well balanced. I think that we do catch enough of them to discourage such violations.

Coats: Thank you, Steve, I think that concludes our program this morning, and I'm going to turn it back to Tom Bahr.

Bahr: I think the conference here has been an outstanding success. I hope you share that opinion with me. I heard many candid and courageous comments from the panelists. I heard rational answers to many questions, I learned a lot, and I hope that many of you go back with a few new ideas. I've met many new, fine people that I had not met before; I know for a fact that I am going to see many of you in the very near future. Let me at this time extend my personal thanks to the distinguished panel members, many of you traveled many miles to get here, and I think we all appreciate your insight into some of these important issues. Workshop leaders, you put a lot of work into your workshops in preparation, and it is reflected in what came out of the workshops. To the advisory panel for the conference and my staff, thanks for your help, and to the Cisco Ford Equipment Company, the Romney Equipment Company, and the Tri-State Equipment Company for their help

in sponsoring our gathering last evening. At this time I'd like to declare the 23rd Annual New Mexico Water Conference adjourned, and we'll see you next year.