FINAL
ENVIRONMENTAL STATEMENT
FOR THE
PROTOTYPE OIL SHALE LEASING PROGRAM

Volume VI of VI

Public Hearings Held During the Review Process

U.S. DEPARTMENT OF THE INTERIOR
1973

F I N A L

ENVIRONMENTAL STATEMENT

FOR THE

PROTOTYPE OIL-SHALE LEASING PROGRAM

Volume VI of VI

Public Hearings

Held During the

Review Process

Prepared in Compliance With

Section 102 (2) (c) of the National Environmental

Policy Act of 1969

Prepared by

UNITED STATES DEPARTMENT OF THE INTERIOR

1973

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SUMMARY

Final Environmental Statement
Department of the Interior, Office of the Secretary

1. Administrative type of action:

2. Brief description of action:

This action would make available for private development up to six leases of public oil shale lands of not more than 5,120 acres each. Two tracts are located in each of the States of Colorado, Utah, and Wyoming.

Such leases would be sold by competitive bonus bidding and would require the payment to the United States of royalty on production. Additional oil shale leasing would not be considered until development under the proposed program had been satisfactorily evaluated and any additional requirements under the National Environmental Policy Act of 1969 had been fulfilled.

3. Summary of environmental impact and adverse environmental effects:

Oil shale development would produce both direct and indirect changes in the environment of the oil shale region in each of the three States where commercial quantities of oil shale resources exist. Many of the environmental changes would be of local significance, and others would be of an expanding nature and have cumulative impact. These major regional changes will conflict with uses of the other physical resources of the areas involved. Impacts would include those on the land itself, on water resources and air quality, on fish and wildlife habitat, on grazing and agricultural activities, on recreation and aesthetic values, and on the existing social and economic patterns as well as others. The environmental impacts from both prototype development at a level of 250,000 barrels per day of shale oil and an industry producing a possible 1 million barrels per day by 1985 are assessed for their anticipated direct, indirect and cumulative effects.

4. Alternatives considered:

A. Government development of public oil shale lands.
B. Change in number and location of tracts to be leased.
C. Delay in development of public oil shale lands.
D. No development of public oil shale lands.
E. Unlimited leasing of public oil shale lands.
F. Obtaining energy from other sources.

5. Comments have been requested from the following:

Federal agencies, State agencies, and private organizations listed in Volume IV, Section F.

6. Date made available to the Council on Environmental Quality and the Public:

Draft Statement: September 7, 1972

Final Statement:

INTRODUCTORY NOTE

THIS FINAL ENVIRONMENTAL STATEMENT HAS BEEN PREPARED PURSUANT TO SECTION 102 (2) (C) OF THE NATIONAL ENVIRONMENTAL POLICY ACT OF 1969 (42 U.S.C. SECS. 4321-4347). ITS GENERAL PURPOSE IS A STUDY OF THE ENVIRONMENTAL IMPACTS OF OIL SHALE DEVELOPMENT.

THE SECRETARY OF THE INTERIOR ANNOUNCED PLANS ON JUNE 29, 1971, FOR THIS PROPOSED PROGRAM AND RELEASED A PRELIMINARY ENVIRONMENTAL STATEMENT, A PROGRAM STATEMENT, AND REPORTS PREPARED BY THE STATES OF COLORADO, UTAH, AND WYOMING ON THE ENVIRONMENTAL COSTS AND PROBLEMS OF OIL SHALE DEVELOPMENT.

THE PROPOSED PROGRAM IS IN CONCERT WITH THE PRESIDENT'S ENERGY MESSAGE OF JUNE 4, 1971, IN WHICH HE REQUESTED THE SECRETARY OF THE INTERIOR TO INITIATE "A LEASING PROGRAM TO DEVELOP OUR VAST OIL SHALE RESOURCES, PROVIDED THAT ENVIRONMENTAL QUESTIONS CAN BE SATISFACTORILY RESOLVED."

AS PART OF THE PROGRAM, THE DEPARTMENT AUTHORIZED INFORMATIONAL CORE DRILLING AT VARIOUS SITES IN COLORADO, WYOMING, AND UTAH AND 16 CORE HOLES WERE COMPLETED. THE DEPARTMENT REQUESTED NOMINATIONS OF PROPOSED LEASING TRACTS ON NOVEMBER 2, 1971, AND A TOTAL OF 20 INDIVIDUAL TRACTS OF OIL SHALE LAND WERE NOMINATED. WITH THE CONCURRENCE OF THE CONCERNED STATES, THE DEPARTMENT OF THE INTERIOR ANNOUNCED ON APRIL 25, 1972, THE SELECTION OF SIX OF THESE TRACTS, TWO EACH IN COLORADO, UTAH, AND WYOMING.

THE PROGRAM IS ESSENTIALLY UNCHANGED FROM THAT ANNOUNCED ON JUNE 29, 1971, BUT THE PRELIMINARY STATEMENT ISSUED AT THAT TIME

WAS EXPANDED TO CONSIDER THE IMPACT OF MATURE OIL SHALE DEVELOPMENT, THE IMPACT OF DEVELOPMENT OF THE SIX SPECIFIC TRACTS, AND A COMPREHENSIVE ANALYSIS OF OTHER ENERGY ALTERNATIVES.

THE DRAFT OF THIS FINAL ENVIRONMENTAL STATEMENT WAS RELEASED TO THE PUBLIC ON SEPTEMBER 7, 1972. A PUBLIC REVIEW PERIOD WAS HELD THAT ENDED ON NOVEMBER 7, 1972. THIS REVIEW PROVIDED IMPORTANT INFORMATION UPON WHICH TO EXPAND AND CORRECT, WHERE APPROPRIATE, THE DRAFT MATERIAL.

VOLUME I OF THIS FINAL SET OF SIX VOLUMES PROVIDES AN ASSESSMENT OF THE CURRENT STATE OF OIL SHALE TECHNOLOGY AND DESCRIBES THE REGIONAL ENVIRONMENTAL IMPACT OF OIL SHALE DEVELOPMENT AT A RATE OF ONE MILLION BARRELS PER DAY BY 1985. VOLUME II EXTENDS THIS STUDY WITH AN EXAMINATION OF ALTERNATIVES TO THE ONE MILLION BARREL PER DAY LEVEL OF SHALE OIL PRODUCTION. VOLUMES I AND II THUS CONSIDER THE REGIONAL AND CUMULATIVE ASPECTS OF A MATURE OIL SHALE INDUSTRY.

VOLUME III EXAMINES THE SPECIFIC ACTION UNDER CONSIDERATION, WHICH IS THE ISSUANCE OF NOT MORE THAN TWO PROTOTYPE OIL SHALE LEASES IN EACH OF THE THREE STATES OF COLORADO, UTAH, AND WYOMING. ITS FOCUS IS ON THE SPECIFIC ENVIRONMENTAL IMPACTS OF PROTOTYPE DEVELOPMENT ON PUBLIC LANDS WHICH, WHEN COMBINED, COULD SUPPORT A PRODUCTION POTENTIAL OF ABOUT 250,000 BARRELS PER DAY.

VOLUME IV DESCRIBES THE CONSULTATION AND COORDINATION WITH OTHERS IN THE PREPARATION OF THE FINAL STATEMENT, INCLUDING COMMENTS RECEIVED AND THE DEPARTMENT'S RESPONSES. LETTERS RECEIVED DURING THE REVIEW PROCESS ARE REPRODUCED IN VOLUME V, AND ORAL TESTIMONY IS CONTAINED IN VOLUME VI.

THIS DOCUMENT IS BASED ON MANY SOURCES OF INFORMATION, INCLUDING RESEARCH DATA AND PILOT PROGRAMS DEVELOPED BY BOTH THE GOVERNMENT AND PRIVATE INDUSTRY OVER THE PAST 30 YEARS. MANY FACTORS, SUCH AS CHANGING TECHNOLOGY, EVENTUAL OIL PRODUCTION LEVELS, AND ATTENDANT REGIONAL POPULATION INCREASES ARE NOT PRECISELY PREDICTABLE. THE IMPACT ANALYSIS INCLUDED HEREIN IS CONSIDERED TO CONSTITUTE A REASONABLE TREATMENT OF THE POTENTIAL REGIONAL AND SPECIFIC ENVIRONMENTAL EFFECTS THAT WOULD BE ASSOCIATED WITH OIL SHALE DEVELOPMENT.

IT SHOULD BE NOTED THAT SUBSTANTIAL AMOUNTS OF PUBLIC LANDS IN ADDITION TO THE PROTOTYPE TRACTS WOULD BE REQUIRED FOR AN INDUSTRIAL DEVELOPMENT TO THE ONE MILLION BARREL PER DAY LEVEL CONSIDERED IN VOLUMES I AND II. IF EXPANSION OF THE FEDERAL OIL SHALE LEASING PROGRAM IS CONSIDERED AT SOME FUTURE TIME, THE SECRETARY OF THE INTERIOR WILL CAREFULLY EXAMINE THE ENVIRONMENTAL IMPACT WHICH HAS RESULTED FROM THE PROTOTYPE PROGRAM AND THE PROBABLE IMPACT OF AN EXPANDED PROGRAM. BEFORE ANY FUTURE LEASES ON PUBLIC LANDS ARE ISSUED, AN ENVIRONMENTAL STATEMENT, AS REQUIRED BY THE NATIONAL ENVIRONMENTAL POLICY ACT, WILL BE PREPARED.

AVAILABILITY OF FINAL ENVIRONMENTAL STATEMENT

The six-volume set may be purchased as a complete set or as individual volumes from the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402; the Map Information Office, Geological Survey, U.S. Department of the Interior, Washington, D. C. 20240; and the Bureau of Land Management State Offices at the following addresses: Colorado State Bank Building, 1600 Broadway, Denver, Colorado, 80202; Federal Building, 124 South State, Salt Lake City, Utah, 84111; and Joseph C. O'Mahoney Federal Center, 2120 Capital Avenue, Cheyenne, Wyoming, 82001.

Inspection copies are available in the Library and the Office of the Oil Shale Coordinator, U.S. Department of the Interior, Washington, D. C., and at depository libraries located throughout the Nation. The Superintendent of Documents may be consulted for information regarding the location of such libraries. Inspection copies are also available in Denver, Colorado, in the Office of the Deputy Oil Shale Coordinator, Room 237E, Building 56, Denver Federal Center, Denver, Colorado 80225, in all the Bureau of Land Management State Offices listed above, and in the following Bureau of Land Management district offices: Colorado: Canon City, Craig, Glenwood Springs, Grand Junction, Montrose; Utah: Vernal, Price, Monticello, Kanab, Richfield; Wyoming: Rock Springs, Rawlins, Casper, Lander, Pinedale, Worland.

I. TRANSCRIPTS OF PUBLIC HEARINGS HELD

The Draft Environmental Statement for the Proposed Prototype Oil-Shale Leasing Program was released by the Department of the Interior on September 7, 1972. Notice of availability of the Draft Statement was published in the Federal Register, pages 18098 + 18099, vol. 37, No. 174, Thursday, September 7, 1972. In that same location, a notice was also published announcing that public hearings on the Draft Statement were to be held in the state capitol of the three States invloved, Colorado, Wyoming and Utah, and in three cities of those same States near the proposed lease sites. The published notice announced that written comments would be received on the Draft Statement for a period of 45 days (until October 23, 1972) after the publication of the notice. This deadline was later extended by the Secretary of the Interior to November 7, 1972, responding to comments received both in writing and at the public hearing requesting an extension in time.

Testimony was received from 95 individuals at the public hearings held during the week of October 10 to 13, 1972. Transcripts of this testimony comprises 450 pages. In addition to the oral testimony, material was submitted to the Director, Office of Hearings and Appeals, that totaled 388 pages. These materials were designed as "Exhibits" of the particular public hearing at which these were submitted.

All of the written comments and hearings material were systematically indexed by the Department of the Interior and the indexed material was made available to the specialists involved in the preparation of the Final Environmental Statement. Reproduction of all letters received by the Department are contained in Volume V. A list of hearings, exhibits, and other material submitted to the Department are listed in Volume V, Chapter II, Section C. These materials are available for public inspection in the Office of the Oil Shale Coordinator, U.S. Department of the Interior, Washington, D.C. 20240.

The present volume (VI) contains the transcripts of the oral comments received during the six public hearings held during October 1972. Where errors in the transcripts have been brought to the Department's attention, these have been noted in the transcript by the Department.

UNITED STATES OF AMERICA

DEPARTMENT OF THE INTERIOR

In the Matter of:	
DRAFT ENVIRONMENTAL STATEMENT FOR THE PROPOSED PROTOTYPE SHALE LEASING PROGRAM.	

Federal Center Auditorium
Denver, Colorado
Tuesday, October 10, 1972

Met, pursuant to notice, at 9:30 o'clock a.m.

BEFORE:

JAMES M. DAY, Director, Office of Hearings and Appeals, U. S. Department of the Interior.

PANEL MEMBERS:

REID STONE, Oil Shale Coordinator.

ANDREW DE CORA, Bureau of Mines.

ALBERT LEONARD, Bureau of Land Management.

KENNETH ROBERTS, Bureau of Sports Fisheries and Wildlife.

* * *

I N D E X

I N D E X

AFTERNOON SESSION (Continued)

1/ Warner should be Wanner
2/ Leopold should be Robert Turner
3/ Jeanne P. Foster should be V. Crane Wright

P R O C E E D I N G S

Mr. Day: This hearing will come to order. My name is James M. Day and I am Director of the Office of Hearings and Appeals, United States Department of the Interior.

Sitting on the panel as representatives of the Department are Mr. Reid Stone, Oil Shale Coordinator; Mr. Andrew DeCora, Bureau of Mines; Albert Leonard, Bureau of Land Management; and Mr. Kenneth Roberts, Bureau of Sports Fisheries and Wildlife.

The purpose of this hearing is to receive comments on the Draft Environmental Statement for the Proposed Prototype Oil Shale Leasing Program, pursuant to Section 102(2)(C) of the National Environmental Policy Act of 1969.

In accordance with provisions of the National Environmental Policy Act, the draft environmental statement was made available to the Council on Environmental Quality on September 6, 1972, and a Notice of Availability published in the Federal Register on September 7, 1972. This document has been marked as Exhibit 1.

The Office of Hearings and Appeals published a Notice of Public Hearing on the draft environmental statement in the Federal Register on September 7, 1972, scheduling the hearing for today, beginning at 9:30 a.m. Interested parties wishing to appear were advised to contact:

Director, James M. Day
Office of Hearings and Appeals
U. S. Department of the Interior
4015 Wilson Boulevard
Arlington, Virginia 22203

An official reporter, Gilda M. Loyd, will make a verbatim transcript on the hearing. All the matter that is spoken while the hearing is in session will be recorded by the reporter. In order to insure a complete and accurate record of the hearing, it is absolutely necessary that only one person speak at one time.

While the hearing is in session, no one will be recognized to speak other than the parties who wish to present statements.

It should be understood that this is not an adversary proceeding. The participants presenting their views will not be sworn or placed under oath. There will be no examination on interrogation of any of the participants. However, the panel may ask witnesses questions in order to clarify matters brought out in the testimony.

The participants will be called in the order shown on the list available at the press table.

Although there will be no strict procedural rules, I would like to stress two important points. The first is that the presentations should be relevant and supported by pertinent data. If any comment is directed to the draft environmental statement, please refer to the applicable pages of that statement, and if information is quoted from technical or scientific journals or other publications, please give the name, author, page number and date of the publication.

Participants may submit written statements at the conclusion of their oral presentations. The statements will be marked as exhibits.

I do not, however, wish to receive written statements as exhibits unless they contain material that has not been covered in the oral presentation.

It will be quite helpful to the reporter if we could obtain copies of any prepared statements. Accordingly, the participants will be contacted as they approach the speaker's table to see if copies of their presentation are available. Any such statements will not, however, become a part of the record unless a specific request is made and unless it contains material that is not covered in the oral presentation.

Oral statements at the hearing will be limited to a period of 10 minutes. What I'll do in this particular instance, after about 8 minutes, I'll give a light tap of the gavel and allow about 2 minutes to conclude. This limitation will be strictly enforced in that we have a large number of witnesses and we would like to hear everybody. To the extent that time available after presentation of oral statements by those who have given advance notice, I will give others present an opportunity to be heard.

In addition to that, I have about 7 or 8 people who filed late and I will take them right after I have called the first list. If you are not present, anyone not present when I call your name, that name will be dropped to the tail end of the list and we'll call you one more time.

The first witness this morning is Thomas Ten Eyck on behalf of Governor John A. Love.

STATEMENT OF MR. EYCK

Mr. Day, gentlemen on the Panel, ladies and gentlemen, before

the day is out you will hear statements from the State Government and before this is closed on October 23, perhaps additional and detailed statements from various elements of State Government will be furnished to the Department for their consideration as they review the draft statement.

I'm now going to read for you a statement prepared by and on behalf of Governor John Love, State of Colorado.

"Thank you, Mr. Examiner, for giving me this opportunity to state the position of the Government of Colorado on the development of oil shale.

Every up-to-date prediction about the supply and demand of energy in the United States over the next few years shows clearly that there will be an ever-increasing energy deficit. Our domestic reserves of environmentally acceptable fuels are being depleted faster than new reserves are being discovered, and, of course, our population is growing. This means that even if each of us consumes no more energy in future years that he now does, the supply-demand gap will continue to widen.

Our efforts to clean up our environment also are causing our total energy consumption to rise. For example, our new, cleaner car engines get fewer miles per gallon; energy must be expended to remove the sulfur and other pollutants from the fuels we burn; and we are increasing our reliance on electricity which is a cleaner, but less efficient energy source.

The growing energy gap must be filled, either by increased

reliance on imported oil and gas, which history has shown us to be insecure, or by development of vast new domestic resources. The oil shale reserves in the Piceance Creek Basin of Colorado constitute the largest known hydrocarbon deposit in the world and can make a very important contribution to the solution of our national energy crisis.

Looking at the energy problem on a statewide scale instead of the nationwide scale, our projections show that Colorado will also soon have it's own energy deficit. Coloradoans have been fortunate that over the past several decades Colorado's oil and gas reserves have been ample to supply our local energy needs, enabling us to be a net exporter of energy. However, these reserves of clean fuels are now declicing, so that by 1976 we estimate Colorado will be a net importer of energy unless new sources of environmentally clean fuels are developed within the State.

Thus, there are very strong reasons why shale oil should be developed now. Nevertheless, it has been since its inauguration, and continues to be, the policy of this administration that oil shale will not be developed until we are satisfied that it can be done without causing significant environmental damage or otherwise degrading the quality of our lives.

Additional environmental studies, funded in part by the State of Colorado, are underway. The total cost of these studies will be approximately $700,000.

The State of Colorado has for several years been monitoring the environmental effects of oil shale prototype development projects,

and this vigilance will continue.

We will keep ourselves fully informed of oil shale development plans and operations, and there will be strict enforcement of all of Colorado's environmental protection laws, and I will recommend new legislation as it may be required.

We are encouraged that the Federal Government appears to be exercising very careful control over all aspects of oil shale development which may affect the environment. The proposed lease stipulations seem, after preliminary analysis, to give the Federal Government the ability to prevent unacceptable changes in our environment. However, we do not rely on these lease stipulations or on the Federal Government to protect the environment of our State. The Government of the State of Colorado will independently enforce its own environmental protection laws.

I understand that the Draft Environmental Impact Statement under consideration today points out that under some circumstances oil shale development might cause air and water pollution. I have directed the appropriate Colorado State agencies to review the Impact Statement with care and to advise me. If it appears that oil shale development cannot take permit development. If development does go forward, we will be vigilant and forceful to secure continuing compliance with State standards.

Assuming, as I believe, that oil shale can be developed consistently with the needs of our environment, there are substantial potential benefits to be enjoyed by Coloradoans. The oil shale region

has long lagged behind the State average economically. Unemployment has been higher and per capita income lower. The jobs and income which an oil shale industry would create for Coloradoans would be very welcome there. And, of course, there would be a significant increase in State revenues generally.

Mr. Examiner, we are grateful to the Department of the Interior for conducting these hearings in Colorado to receive the comments of Coloradoans, who would be most directly affected by an oil shale industry. We are also grateful for the excellent cooperation and communication which the Government of Colorado has had with the Federal Government, and with industry and environmental groups as well. We trust this cooperation will continue so that we can most effectively discharge our duty to protect the interests of the citizens of Colorado."

That concludes the Governor's statement, I have given a copy to the reporter.

MR. DAY: Thank you very much. I'll now exercise the prerogative that will be exercised numerous times today, and take a name out of order. I now call on Doctor Francis Brush.

DR. BRUSH: Thank you, Mr. Chairman.

STATEMENT OF DOCTOR BRUSH

Mr. Chairman, I would like to express my thanks for the opportunity of being here today to present testimony on proposed oil shale development in Colorado.

Nearly a month ago I wrote a letter to the Secretary of the Interior, Rogers C. B. Morton, commenting on the environmental impact

statement of the proposed oil shale development. I would like to read that letter here as a part of my statement:

"Dear Mr. Secretary: In reviewing the recent environmental impact statements on oil shale developments in Colorado, Wyoming, and Utah, it is obvious that such developments will have serious and long-lasting impact on the environment. In particular, it will affect the quality of life enjoyed by many of the citizens of those three states as well as the citizens of the rest of these United States who visit this region.

It is also becoming obvious that oil shale development is not the best solution to our so-called energy crisis. It merely represents a slightly different approach and one which will continue to degrade the environment. I fear that once we have expended funds for oil shale development, there will be a great impetus for continuing the program on a large scale and to the detriment of research and development efforts in other areas of energy production.

Before committing ourselves to such irreversible and damaging developments, we must begin now exploring all possible energy sources. I would ask, for example, that a crash program be initiated to explore economic development of solar, tidal, and geothermal energy sources. Solar power in particular offers great hope for supplementing existing energy supplies, and yet funding for solar power research is minimal and, as far as I can determine, practically no corporate funds are being spent in this important area. Since roughly one-third of all crude oil is converted to fuel oil, a major source of heating and power is this

nation, efficient and economical solar power utilization would reduce the need for more oil.

There are other possibilities as well. Hydrogen as a chemical fuel offer potention in some uses but, until now, the cost of separating it catalytically and electrolytically has been prohibitive. Recent breakthroughs, however, at the Euratom research center at Ispra, Italy offer the possibility of producing hydrogen much more economically. (And, by the way, solar power lends itself nicely to this process and may be quite useful.) I'm sure you are aware that hydrogen is the cleanest fuel available - its combustion product is water. And the supply, on a global scale is virtually limitless in the water that covers two-thirds of the earth's surface.

I offer these as possibilities, not as certainties. My main point is that we haven't explored thoroughly all of these possibilities. Moreover, there are some great needs in the area of social planning that should be implemented. The development of efficient mass transportation systems for our urban areas can greatly reduce consumption of gasoline (to say nothing of alleviating air pollution as well). And until we have put forth a massive effort for such research and social planning, we should not continue developing at this time such destructive and polluting energy sources as oil shale. The shale will still be there in the future, if and when we need it.

I would therefore like to ask you to declare a moratorium on oil shale development until such a time that we have thoroughly exhausted possible development of other, cleaner sources of energy. I would also

ask you to join me in urging that a massive, NASA-type research program be undertaken to develop solar, tidal, geothermal, and other such energy sources. If indeed the energy situation for this nation is reaching crisis proportions as some would have us believe, then it would seem logical to pursue research into all potential energy sources, particularly those that promise minimal environmental impact and as quickly and as vigorously as possible.

The citizens of Colorado do not treat lightly their quality of life. Clean air and water and unspoiled mountains and forest are the essential elements of making Colorado a desirable place to live, especially since these elements are becoming rare elsewhere across the nation. The development of oil shale will seriously impair the quality of life for Colorado citizens and I feel that most people here question the wisdom of such development at this time."

As you can see, I am quite firmly opposed to any development program on oil shale until such a time as we have thoroughly exhausted research and development efforts on such things as solar, tidal, geothermal, nuclear fusion, or other less environmentally damaging sources.

I am also quite aware of the current scare tactics being used by big business interests, unfortunately often being supported by professional partisians, tactics which allude to a so-called energy crisis.

I charge that such tactics are being used to rush the public into supporting unwise and immensely damaging developments. And the deception is being carried out by industries that have done virtually

nothing to explore new energy sources.

For example, recent figures show that power companies in this nation collectively spent a mere 46 million dollars last year on research and development. Most of this, apparently, was research and development on new products and uses of electricity and on pollution control. Practically nothing was spent on solar energy research.

By comparison, these same companies spent an astonishing and irresponsible 365 million dollars on advertising on entice people to use more and more electricity. In other words, more than seven times as much was spent on advertising than was spent on research and development.

Similarly, the oil and petroleum industry invests huge amounts of money on advertising their destructive and polluting products, but as far as I can determine, practically nothing is spent on developing clean energy sources such as solar power. Such activities represent the epitome of industrial irresponsibility.

But even worse, we are now being asked to allow these corporations to continue such madness or an even larger and more destructive scale in the development of oil shale deposits. And despite the soothing pronouncements of oil industry public relations people, this development is going to cause irreparable damage to Colorado's land and water and air. It will adversely affect the quality of life of not only the people in the immediate area of development, but the citizens all over Colorado.

I urge that we begin a massive, federally funded research and

development program of the same scale as the space program to investigate all possible energy sources. Furthermore, we should set a timetable as we did in the NASA program, so that by the end of this decade we might be enjoying the benefits of clean, solar energy, for example. I think that such a program is absolutely vital because, as scientists have pointed out, the fossil fuels available on this planet are limited. Sooner or later we must seek out alternatives. I say we should do it now and not wait until Colorado has been stripmined and laid waste.

Thank you, sir.

MR. DAY: I would like to ask the witnesses to state their full name and affiliation.

STATEMENT OF PETE BARROWS

MR. BARROWS: Mr. Day, Members of the Board, Ladies and Gentlemen, my name is Pete Barrows, Colorado Division of Wildlife. I'm here today to make a short general statement concerning the comments on the Draft Environmental Statement for the proposed prototype oil shale leasing program.

The Colorado Division of Wildlife is currently reviewing the Proposed Statement to Develop Oil Shale on two 5,120 acre leases on federal lands in the State of Colorado. The Draft Environmental Statement states that "oil shale development would produce direct and indirect changes in the environment of the oil shale region..." Some of the changes would be local, some regional and others national.

The Division must necessarily submit written comments to the oil shale coordinator as we have had insufficient time to comprehensively

review and analyze the Environmental Statement. We will submit general comments concerning the impact of oil shale development on a national and regional scale, specific comments on local impacts.

Essentially, the wildlife resources of the Piceance Basin will be adversely affected by any development of oil shale. Consequently from a purely wildlife viewpoint we would oppose any development. We are concerned with the future of the wildlife resources in the area and have and will continue to do all possible to prevent an irreparable loss; failing this we will assuredly attempt to require the mitigation of any loss.

The State of Colorado, four Colorado counties, the federal government and the 12 petroleum companies involved in shale development have entered into a $715,000 contract to finance a two-year independent study of the prototype shale development program.

Four committees have been created to monitor the studies: 1) Revegetation and Surface Revegetation and Surface Rehabilitation; 2) Environmental Inventory and Impact; 3) Water Resource Management; and 4) Regional Development and Land Use Planning. Much of the necessary data will be collected, compiled and analyzed by these Committees. We feel the information provided by the Committees should become an integral part of any proposed oil shale development, thus a review and analysis of the Environmental Statement might be premature at this time.

We appreciate the opportunity to appear before the Panel. Thank you.

MR. DAY: Mr. John H. Tippit.

STATEMENT OF JOHN H. TIPPIT

MR. TIPPIT: Good morning. My name is John H. Tippit, 1704 Security Life Building in Denver, I represent the Rio Blanco National Gas Company and Rio Verde National Gas Company, and I would like to say that my clients do appreciate the opportunity of backing in the order immediately behind Governor Love and Mr. Brush and Mr. Barrows, particularly in view of the fact that up until the game started this morning we weren't even in the program. We refer there to the list of the people--the companies--who were invited to make comments or appear before the Department of the Interior with suggestions toward the Draft Environmental Statement. I hope though that through the remarks and the statements submitted by my clients that their interests will be shown to you to be very real and present and significant with reference to the suggested Oil Shade Prototype Development Program.

The Rio Blanco Companies are composed primarily of independent oil men who started and still are primarily controlled by Colorado citizens. These companies own some 33,000 acres of oil and gas leases covering land in the oil shale area.

In Tract C-b, which is one of the 2 tracts suggested for Colorado, the Rio companies own oil and gas leases covering some 40 percent of the lands in that particular tract. The impact resulting from the oil shale suggested program, consequently, is most significant.

The principal thrust of the statement which has been presented for your study at a later time, is that the Draft Environmental State-

ment in some incredible manner fails to consider the full impact of the Suggested Oil Shale Development Program on oil and gas development. The direct impact is mixed in with the impact on some 35 other subjects such as hunting, fishing, soil erosion, whatever it might be. One of those other 35 subjects is "other minerals." In the other minerals I suppose that oil and gas is one of the other minerals. There are really no direct statements in the Draft Environmental Statement as to what the effect on the oil and gas specific development in this area might be.

A kind of lip service is given to the problem by saying that, and I quote, "to the extent practical," some compatible solution might be worked out, these other minerals might be produced too. We believe that is really not a proper handling of the matter and, consequently, consideration should be given to the impact on oil and gas development.

For instance, Tract C-b is located entirely in the Rio Blanco area. As far as I have been able to find out, the entire, all three volumes of the Draft Environmental Statement, never mention Rio Blanco unit area. This is one of the largest unit areas of the development of oil and gas in the Continential United States, consists of 93,000 acres. It is a significant development which, by its approval through the United Stated Geological Survey, is shown to be in the public interest, in the view point of conservation of oil and gas.

The second thing that the Draft Environmental Statement might have given some slight notice to is that the Rio Blanco unit area in Project Rio Blanco stimulation type gas formation are interrelated to Atomic Energy Commission, many private companies have spent untold sums

of money and expended great effort in determining or trying to determine the potential of gas production from the Rio Blanco unit area.

As incredible as it may seem, I find no absolute statement in this Draft Statement as to the direct effect on Project Rio Blanco of the proposed Oil Shale development. More forthright, in that consideration, are articles which have appeared in Colorado newspapers; the copies of these articles are appended to our Draft Statement, one, the Grand Junction paper and one, the Rifle paper. Both of these newspaper articles said in the view of some people of the Department of the Interior that these two programs, meaning the Project Rio Blanco and the Oil Shale Development Program "will not mix," whatever that means.

The articles go further to state that the Department holds a dim view of the entire Plow Share Program. This would seem to be not exactly in context with the boss of the Department of the Interior, President Nixon, who in his June 4, 1971 statement on clean energy gave us one of the very viable alternatives, the use of nuclear stimulation of tight gas formations. We believe that with some 11 million acres to have been chosen from that the selection of Tract C-b, in both Rio Blanco unit area as well as being vitally associated with Project Rio Blanco, was a deliberate confrontation which could have been avoided. Many other lands, as this Board knows, were excluded lands. For instance, for deer winter range, for fish stream management, or even for a trona deposit, were excluded for consideration.

We believe in the absence of the Department wanting a strict oil shale development and Project Rio Blanco, that these lands could

have been excluded too, where they were included in a federally approved unit area. We believe that, consequently, the Draft Environmental Statement should have been candid and direct in this view that if it really did intend to kill the Project Rio Blanco, it did intend to have an adverse effect on all oil and gas development which it was not prepared to resolve at that moment in favor of oil and gas, it should have said so, as implied in these various newspaper articles, keeping in mind the tremendous potential affect upon the national interest of losing the potential 300 trillion cubic feet of gas that Project Rio Blanco may be able to produce, the 150 billion cubic feet of gas, which is a potential just in Tract C-b, and to say not the least from the viewpoint of my clients, 30 million dollars or so worth of gas attributable to their oil and gas lease in Tract C-b, and only some of the formations. All of this leads to what we believe to be justification for a direct and perhaps blunt statement on the whole matter which my clients are willing to make.

They believe those in the Department who are in charge of oil shale development, and no doubt with the encouragement of private companies who have the same accord have already made a decision which will become more apparent in the future, that oil and gas developments must surrender to oil shale development in the Rio Blanco unit area. We believe that this was a decision that was not necessary and which, in large part, resulted in the location of Tract C-b, which had to lead directly to such a confrontation.

We believe the exhibits and the attitude unbelievably presump-

tuous in three regards: one, it violates the spirit of the statement of the President as to a balanced consideration of all sources of energy, as well as the commendable goals recited in the Draft Statement; two, it is apparently willing to destroy or attempt to destroy Project Rio Blanco, with the enormous potential impact on the national energy crises, which this would embody, and yet, never note the matter directly as a possible impact, and third, in doing this, it has unilaterally pre-empted another department of government, the Atomic Energy Commission, which has not, to our knowledge, been made aware of this confrontation thus created.

Our recommendations with reference to the statement is as follows: First, the impact of oil shale development, of oil and gas, should be considered fully. The few lines given the subject by generalizing to the effect that the development of other minerals would be compatible where possible is not sufficient. Secondly, the impact of oil shale development on Project Rio Blanco should be likewise considered fully. If as stated in these newspaper articles, Project Rio Blanco would be prohibited, that should be stated directly, and its effect on the national interest considered. Thirdly, Tract C-b should be redesignated at another location not in a federally approved unit for oil and gas development. To a great extent and, perhaps completely, this might eliminate the problems of one and two. Fourth, if policies have been formed by the Department of the Interior which are antagonistic to oil and gas development, whether nuclear or conventional, in an oil shale area, then in fairness to oil all these

policies should be made known at all. And last, decisions involving major preferences between potention large sources of energy should not be decided unilaterally in one Department of the government, but instead should be the subject of study by a congressional committee unilaterally in one Department of the government, but instead should be the subject of study by a congressional committee, the White House Energy Committee, the OEP, the FPC, or another body not committed to a particular viewpoint.

Thank you, very much.

MR. DAY: Thank you, Mr. Tippit.

I now call on the Equity Oil Company.

STATEMENT OF PAUL M. DOUGAN

MR. DOUGAN: Gentlemen, my name is Paul M. Dougan. I am an officer of Equity Oil Company. Equity Oil Company has actively been engaged in various aspects of the "oil shale industry" since 1950. The company owns 4,568 acres patented fee land in the Piceance Creek Basin, Colorado. It has conducted laboratory and field research in an effort to develop an in situ process for the production of oil from oil shale and has drilled 61 wells in the Basin which have penetrated the oil shale section. Geologic and reservoir information obtained from this drilling was furnished to the Bureau of Mines and has provided a substantial portion of the oil shale resource data which is available today in the Piceance Creek Basin. To date we have expended $2,800,000 in oil shale research and this expenditure does not include the drilling costs associated with the aforementioned wells. These activities, coupled with the observation of the oil shale scene

for more than twenty years, qualify us to comment on the environmental statement for the proposed prototype oil shale leasing program, particularly as it related to the Piceance Creek Basin, Colorado.

The Draft Environmental Statement presents a thorough factual basis for assessing the potential impact of an oil shale industry on the environment but, in our opinion, the Statement is deficient in the following respects: (1) it does not adequately speak to the alternative of private development; (2) it does not set forth sufficient criteria by which the value of the proposed lease offering should be measured; (3) it does not present a basis for making a judgement on how an oil shale industry will come into being in the proposed time frame at the projected production rate of one million barrels per day by 1985; and (4) it does not in the proposed from of lease provide for the compatible development of oil and gas, trona, coal and other mineral deposits.

FIRST POINT

At the present time an "oil shale industry" does not exist. Constant references to the industry in the press and elsewhere are misleading. What does exist are field type research projects conducted by a few large and small companies. Most, if not all, of this "industry" has been conducted in the Piceance Creek Basin. The research includes the in situ as well as mining and retorting and has been conducted by private companies on fee land. This research, conducted sporadically over two decades has failed to produce a commercial oil shale

operation.

There is now and has been for many years more than sufficient land in private ownership to support the development of an oil shale industry. There are 400,000 acres of private land in Colorado containing an estimated 210,000,000,000 barrels of oil in place as oil shale. (Table II-6, Vol. I). In fact, this land includes the only property outside of the Naval Oil Shale Reserve where underground Room & Pillar mining using access through a canyon wall has been applied, and this is the only method of underground mining which has been tried in oil shale. In short, no less than thirteen major oil companies hold private land capable of supporting either oil shale mining/retorting operations or in situ operations, and the barrier to development of this land is not lack of access to more Government land, but the failure of these companies to develop to date technology which will allow the economic recovery of the oil shale resources. To the present time, only The Colony Development operation has indicated that it may have the ability to proceed in the near future with the construction of a commercial oil shale operation and at the present time the decision to proceed, so far as we are advised, has not been made. Because of the land position of the Colony Group, it must be assumed that the decision to proceed will be made on the basis of process economics and the ability to make a fair rate of return on

the very substantial investment required and not on the availability of Government land. The companies who are most likely to bid on the proposed lease sale are the same companies who now hold private land. If they cannot and have not built plants on and developed their private land which is more accessible from a mining standpoint, how can it be logically assumed that they or anyone else will develop public land?

SECOND POINT

The Bureau of Mines has conducted extensive oil shale research spanning a period of many years. This work has included both mining/retorting research at their Anvil Points facility, laboratory research at the Laramie Petroleum Research Center, and in situ research near Rock Springs, Wyoming. All of this research has failed to yield a commercially operating process for the recovery of oil from oil shale. If economic criteria for the selection and leasing of public oil shale land has been established by this research, this criteria has not been set forth in the Environmental Impact Statement. Absent such criteria, it must be assumed that the Department of the Interior does not have adequate economic information on which to base the acceptability of a competitive bid nor to establish applicable rents or royalties. In view of this situation, it can only serve the cause of rational development that any leasing program require a guarantee of development or minimum

expenditure in a fixed period of time. Unless this is required, there is no reasonable assurance that commercial production will be obtained. Nor is it clear that if obtained the technology developed, if any, will be utilized to develop Federal lands and thus inure to the benefit of the public. Absent a definitive obligation to develop in the lease agreement, the Department of the Interior should await the finalization of commercial development by private industry on private lands. At that time it could assess the economics of an oil shale operation and conduct leasing of the public land on the basis of established value.

THIRD POINT

Based on the public statements of The Colony Group, the construction of an initial plant will require approximately three years. It appears possible that one plant could be on stream at the end of 1976, assuming that the decision to proceed is made this year. However, it is wishful thinking to project any other plants coming on stream until the commercial technology of the first plant is proven. If the initial plant has a shakedown period of only one year, it would be at least 1978 before construction of any second generation plant could be started and 1981 before it could be on stream at full production. Until proven commercial technology has been developed, there is no reasonable basis upon which to project how many plants will be built by 1985 and the suggested goal of one million barrels per day by 1985 is unsupportable.

FOURTH POINT

In his energy message of 1971, President Nixon not only called

for the early development of the oil shale resources, but also called for the development of all forms of energy, including gas reserves by nuclear stimulation providing it could take place safely. The President, in effect, reiterated the policy of multiple use of resources which has been an underlying principal of Federal land management for many years.

A very large portion of the oil shale of Colorado, Utah and Wyoming is underlain by other formations which contain presently and potentially valuable supplies of oil and natural gas and other minerals. Some of these deposits are recoverable by conventional technology, and some can only be recovered by new techniques such as nuclear stimulation. In fact, the Bureau of Mines has estimated the natural gas reserve which may be recoverable by nuclear stimulation to be 300 trillion cubic feet.

Notwithstanding this fact, the Environmental Impact Statement takes the patently inaccurate position that the alternative of nuclear stimulation of natural gas reservoirs is not now considered a viable alternative when compared to its unsupportable and arbitrary projection of one million barrels per day by 1985.

The mandate of the Environmental Protection Act is that resources and environment must be balanced so that the need of one does not create disproportionate harm to the other. It is also a part of that mandate that the need for energy cannot be solved unless every effort is made to efficiently manage the development and production of all energy resources and it is manifestly wrong to develop and produce one energy resource at the expense of another. It is in this area that the Statement is critically deficient in that it leaves the multiple

development of valuable energy resources to inferences so vague that it lends itself to any future decision of convenience.

Under the National Environmental Protection Act (NEPA), whenever a project which may have substantial impact on the environment is under consideration, the Federal agency having special expertise is given the task of studying the effect of the proposed project on the environment and is required under law to prepare the final environmental statement. The Atomic Energy Commission as the lead agency for the Rio Blanco Gas Stimulation Project has performed its imposed by law duty and has made a detailed study of the compatability of nuclear stimulation of natural gas and oil shale development. In its final environmental statement, the A.E.C. after months of study and after conducting public hearings similar to these concluded as follows:

(a) That nuclear stimulation of natural gas is compatible with the development of oil shale in the Piceance Creek Basin. (F-14, Section 5)

(b) Not only is the Rio Blanco Project intended to prove the feasibility of recovering gas from tight formations, but it is also designed to obtain data on the recoverability of gas specifically from the Piceance Creek Basin. The location of the project can be justified on several grounds. Not only is more known about the extent and distribution of gas in these tight formations than is the case for other areas (due to the large amount of gas well drilling in the area), but also the gas reserves are at

a sufficient (vertical) distance from the other mineral reserves that no damage will be done to these reserves by the detonations (Sections 5 and 6 of the final Environmental Statement).

(c) Responsible government officials have based their evaluation of the nuclear gas stimulation technology on the estimate of 300 trillion cubic feet of natural gas being amenable to recovery by this method. It is felt that the estimate is as reliable as are the estimates of total fossil fuel reserves available to the United States. (F-17, Section 2)

In summary, the lead agency having the legal duty to evaluate the impact of Project Rio Blanco on the environment has made an administrative finding of fact that Rio Blanco is compatible with concurrent oil shale development. This finding by the agency empowered and required by law to make such a determination should lay at rest further consideration of any objection or opposition to Rio Blanco proceeding at the same time as an oil shale development program.

It follows, therefore, that it should be clearly and specifically provided in the final draft of the Statement that multiple development is mandatory and provide that any form of oil shale lease agreement will contain a specific provision to the effect that the Lessee agrees to the compatible development of oil, natural gas and other mineral deposits on the public land. If the Department fails to do this, it disregards its legal duty.

CONCLUSION

The Draft Environmental Impact Statement is seriously deficient in the particulars outlines, and the Department of the Interior has the duty to present a full and fair disclosure of all relevant factors including its intentions with regard to the compatible development of all mineral resources in the proposed lease areas. In considering alternatives to the proposed lease program, it should not indulge in the use of unsupportable numbers as a basis for comparison until commercial production of oil from oil shale becomes a reality.

MR. DAY: Thank you very much, sir.

I call Mr. R. E. Foss, Sun Oil Company.

STATEMENT OF R. E. FOSS

MR. FOSS: Mr. Day, Members of the Panel. I am R. E. Foss, President of Sun Oil Company's North American Exploration and Production Group.

I appreciate this opportunity to appear before you today to respond on behalf of my company to the Department of the Interior's request for comments on the "Draft Environmental Statement for the Proposed Prototype Oil Shale Leasing Program."

The three-volume draft has been analyzed by Sun staff personnel who have been working on the oil shale study. This statement today gives briefly the views and position of Sun management based upon that analysis.

We request permission to file a more detailed statement, with references to pages and with suggestions for changes in language, before

the record closes in order that the more detailed suggestions be included as a supplement to this statement.

First, we would like to acknowledge the impressive and extensive research that went into preparation and publication of the Draft. The people in Interior whose work and expertise went into compiling the impressive statement certainly are to be complimented.

Secondly, I can assure you that Sun Oil Company supports the premise that a prototype program affords the best hope for achieving the goal of providing for the United States

...(a) this new source of energy

...(b) in a time frame that is early enough to be of benefit

...(c) with a commercial technology which will permit the development by private enterprise

...(d) in a manner which will afford a minimum adverse impact on our environment

Sun Oil Company recognizes its environmental responsibilities and has no real quarrel with the pure environmental conclusions of this Draft Statement. However, we must point out our serious doubt that these volumes as a whole present the true economic perspective when they touch upon prices and rates of return and upon expenditures for investments and operating costs, which will include items for conservation and reasonable land restoration. For example, in Volume I under the caption "Environmental Impact," there is a discussion which includes statements that:

(a) A minimum-sized commercial complex would produce 50,000-

barrels a day or possibly as high as 100,000 barrels a day.

(b) The capital investment required would be from 250 to 500 million dollars.

(c) A rate of return of 10 to 13 percent is anticipated.

(d) Calculations are based on an assumed oil price of $3.90 per barrel.

Not only must economic factors be considered, but also we must be realistic in all of our considerations. There must be a balancing of such considerations as the revenues from the oil, the grade of shale to be processed, and the extent of land restoration required. Sun has had a pretty thorough introduction into the problems of recovering oil from tar sands, and we believe that this experience is useful here. On the basis of that experience, we have reached these conclusions;

(a) A facility capable of recovering 50,000 barrels of oil per day from the shale would be a tremendous earth handling operation. Such an operation could be called "minimum" only in the sense that nothing smaller would have much chance of being considered commercial.

(b) A range of 250 to 500 million dollars is an extremely soft estimate. On the basis of tract records, it is safe to say that such estimates of capital requirements usually prove to be on the low side.

(c) As indicated in the Environmental Statement, a 10 to 13 per cent rate of return could be acceptable, but investors

supplying the 250 to 500 million dollars of capital would need some assurance that such a rate is attainable after allowing for unforeseen costs associated with developing a new process. It must be remembered that the investors in this proto-type program cannot rely upon recoupment of losses out of future plants or leases. The prototype investors have no assurance that they will ever get another oil shale tract.

(d) No basis is suggested for the assumption of an oil price of $3.90. It is not clear from the Environmental Statement whether this price is expressed in terms of today's dollars or future dollars. The oil that will be produced and sold from shale is many years down the road. We are not prepared to guess what the price of oil or the value of oil will be at that point in the future. It is our opinion that the prototype programs would not be commercial unless more revenues are generated for the programs than would be derived from the sale of oil at $3.90 per barrel in terms of today's dollars.

We note that Volume II devotes considerable space to the relation of oil imports to the future of oil shale. There can be no question about their interdependence. Furthermore, for the short term there seems to be no choice other than to utilize foreign oil to make up the deficiency between domestic demand and supply. The danger is in allowing our future dependence on foreign oil to reach unacceptable

levels---certainly not the levels of over 40 percent in 1985 as projected in Volume II. We simply must find the best way to make imports work for the solution of this Nation's energy crisis.

We are gratified to find in Volume III a recognition that the lease bonus itself constitutes an undesirable economic burden on development. While spreading of the bonus over several years will help, the fact remains that capital paid out for bonus still is capital not devoted to developing the prototype programs. I don't know what the Government might be required to do with this bonus money, but certainly a logical use would be to find a way to plow it back into the oil shale program.

In this connection, Interior's mention of possibly crediting extraordinary environmental costs against royalty of these prototpye programs is a step in the right direction. Surely there are other powers which the Secretary has under existing law, or might obtain under future law, to insure the progress of these needed but very expensive oil shale prototype programs. We believe the welfare of the Nation requires it.

Thank you for the opportunity to express Sun Oil Company's view on this important matter. Having done so briefly, I request permission to file later the more detailed suggestions I mentioned earlier for inclusion in the record as a supplement to this statement.

MR. DAY: Thank you very much, Mr. Foss.

I call on Richard D. Ridley, Garrett Research and Development Corporation.

STATEMENTMENT OF RICHARD D. RIDLEY

MR. RIDLEY: My name is Dick Ridley, I'm the Project Manager for Oil Shale Research for Garrett Research and Development Company, a wholly-owned subsidiary of Occidental Oil Petroleum Corporation.

If I understand the prototype...proposed prototype leasing program, that program is aimed at leasing sufficient oil shale reserves to private industry and those companies participating may demonstrate their ability to produce oil from shale and the impact.

The total amount of land offered is highly limited so that even if major unexpected impacts occur, the overall effect from development of these sites will still be minimal. This concept of trying oil shale development on a relatively small basis before going into a much larger program seems to be the proper approach in meeting our energy needs and protecting our environment as long as we of the country can live with the resultant development, large-scale production from oil shale.

In his "Clean Energy Message" of June 4, 1971, President Nixon stated, and I quote, "Growing demand for energy and growing emphasis on cleaner fuels will create severe pressure on our fuel supplies," continuing the quote, "the task of providing sufficient clean energy is made especially difficult by the long lead time required to increase energy supply. To move from geological exploration to oil and gas well production now takes 3 to 7 years, new coal mines typically require 3 to 5 years to reach the production stage and 5 to 7 years to complete a large steel power plant."

The President is right on all counts. There is already varied pressure on fuel supplies, lead time is already long, and the additional environmental protection will, which most of us agree is necessary, will increase the lead time even further.

Against this background I believe that there is time only for one prototype leasing program. The next leasing program will almost have to be aimed at achieving large-scale commercial production. Thus, we must have the best possible program at this time.

The present program has many desirable features but apparently includes one major misconception which needs modification in one other respect. This may just be part of my reading of it, but first, the program as written emphasizes underground and surface mining coupled with retorting above ground, the impressions given in situ retorting with the shale still in place is not likely to be successful and can be dismissed.

It is undoubtedly true the environmental impact of above ground mining and situ retorting, for example, it's obvious that spent shale will not be a problem in situ operations, nor will a large open pit result, which would require later reclamation. The retorting potential problem of leaving spent shale will also not be a problem, a problem with site selection will preclude sites where that will be a problem. Also, quite probably, that there will be fewer people involved in an in situ development than a large scale mining with above ground retorting. If the reason in situ processing, environmental statement has the recognition of its minimal impacts, I say all well and good. I fear,

however, that the reason is such processes have been demonstrated on a large scale, or if they have, the results have not been published.

I cannot speak for other companies, but I can say that Garrett Research is the midst of a large scale test of what we believe to be a breakthrough in situ processing. There are other companies like ours without adequate reserves who believe in situ processing is not only feasible but can provide the economically and ecologically sound root needed for oil shale processing. Let us make certain that sufficient sites be present to test on a commercial basis.

My second point is that while it appears to be the intention of the Program to provide sufficient sites the actual selection can almost be guaranteed to be inadequate for demonstration of the various processes. Six, is probably a reasonable, maybe even the optimum number of good sites for the prototype program, but two of these sites are totally unusable for any processing approach, either in situ or mining. The reserves are just not there. It is almost axiomatic that processing costs are a function of the tons of shale processed to produce a given quantity of oil, thus it costs almost as much to process a ton of shale as gives us one gallon of oil as does a ton of shale that give us 40 gallons of oil. The cost of a barrel is dramatically different. The 35 to 38 gallons of oil per ton are marginal at best for today's production; otherwise, we would have a serious development on private lands at this site.

Wyoming, according to the impact statement, two narrow beds of 25 gallons per ton of oil shale, should be dropped from the program

immediately and replaced with two other sites already nominated in Colorado. The case with regard to the Utah sites is not as clear but again, better oil shale than lands in Colorado.

In conclusion, if the leasing program will allow situ operations and if, at least, the Wyoming sites can be replaced by additional Colorado sites, this leasing program can provide an excellent means of both environmental processes and economic viability of each of those provisions.

As an alternative the present program should be immediately followed with leasing of at least 2 additional Colorado sites, appointed once its apparent that the Wyoming sites do not demand any bonus bid acceptable. Given these changes, we should have a much greater chance of creating an environment while providing a new source of energy at the least possible price to the ultimate consumer of the American people.

Thank yoy, very much.

MR. DAY: Thank you.

Mr. Kenneth Canfield, please.

STATEMENT OF KENNETH CANFIELD

MR. CANFIELD: My name is Kenneth Canfield and I hold the position of Operations Manager, Synthetic Crude and Minerals Division, Atlantic Richfield Company. I would like to thank you, both on my own behalf and on behalf of Atlantic Richfield for the opportunity to make a statement at this hearing. We are a member of a venture whose purpose is to develop commercial production from oil shale deposits on lands which are owned by the venture.

Atlantic Richfield is the Operator for the venture and carries out these operations with a special organization called the Colony Development Operation. From March 1971, until late April 1972, we operated a 1,000 ton/day semi-works plant at Parachute Creek, Colorado, employing about 250 people. The plant was shut down after successfully demonstrating, by field operations, that a satisfactory technology existed for recovering oil from shale. The current activities of Colony are aimed at the completion of environmental studies and plant design. On completion we will make a final assessment of the economic feasibility of producing 50,000 barrels/day of shale fuel oil.

Although we are one of the companies that has interests in privately owned oil shale deposits which we believe are sufficiently large to support an initial commercial operation, we nevertheless are very much in favor of the federal government's proposed prototype oil shale leasing program. Based on extensive engineering and environmental studies conducted by our venture and on our own experience as operator of a semi-works oil shale facility, we believe that there is a present need for oil shale development and that this need will grow significantly as the United States' demand for oil continues to grow much faster than the available domestic supply. (page 33, Vol. II of the EIS). We further believe that it is not only important to proceed with oil shale development from a product demand supply view, but also from an environmental view. Our reasons for holding these beliefs are:

(1) <u>The environment will benefit from systematic development of oil shale</u>. The predicted demands for energy are such

that it appears that oil shale resources eventually will have to be developed. Delay in development would avoid, on a short-term basis, any effect on the environment, but in the long run the effect would prove more harmful. We reiterate the warning in the EIS (Vol. II, pages 64 and 65): "Prolonged delay may leave no alternative but to react eventually with a crash program to develop this resource. By their nature, crash development programs frequently sacrifice environmental considerations and regional planning to technologic expediency. The balanced progress needed to resolve the complex interrelationship between the environment and technology is denied and orderly development is not possible."

(2) Oil shale offers a supplemental fuel source which, if utilized, would enhance air quality. The product of a shale plant will be extremely clean, containing essentially no sulphur or ash. If power plants or other facilities burned 1 million barrels/day of shale fuel in lieu of 1 million barrels/day of conventional fuel oil, a dramatic reduction of sulphur dioxide emissions would be observed. For example, under existing Chicago regulations fuel oil containing 1% sulphur may be burned. If fuel obtained from shale oil were substituted for a million barrels/day of 1% sulphur fuel oil, sulphur dioxide emissions would be reduced by 100,000 tons/year. It is apparent that the trend of the future is

towards stricter air pollution requirements and regulations. This trend is evidenced by the strict particulate emission standards of the Los Angeles County Air Pollution District's Rule 67 which controls the total emission from a single plant. If such single plant emission standards are generally adopted it may be possible to comply by utilizing some of the conventional sources of fuel oil. But the ash-free characteristic of shale fuel oil will allow the burning of this material in power generators in compliance with such strict requirements.

(3) The only viable alternate to a barrel of shale oil produced is a barrel of imported oil. The future petroleum needs of the Nation will require rapidly increasing rates of imports of crude oil and products. The recently completed Chase Manhattan Bank in depth analysis entitled "Outlook for Energy in the United States" indicates that dependence on foreign imports will have increased to some 51% of the total supply by 1985. This compares with 20% in 1970 and an estimated 29% in 1972. In addition, more than 75% of the United States' imports are expected to come from the Middle East and Africa by 1985. We would like to point to two major undesirable results of this growing United States dependence of imported oil:

(a) Price escalation of imported oil

Growing United States' dependence, coupled with the

growing strength of the producing Nations, is almost certain to accelerate their demands for higher prices, which ultimately are reflected in higher cost of energy for United States customers. It is clear from the history of negotiations, that long term contracts have not been a satisfactory mechanism for controlling the spiraling demands of the oil-producing Governments. The potential for interruption of supply, at least on a temporary basis, can be effectively used by these Nations as a bargaining tool. The real and growing strength of these countries is revealed in their current successful negotiations to secure participation in the producing companies and in the nationalization of the Iraq Petroleum Company. The blunt facts are, that as we depend more and more on imported oil, we become, as a Nation of consumers, more and more vulnerable to price increases over which we have no control. Development of an oil shale industry will provide an alternate source of supply, and should substantially strengthen our bargaining position with the producing Nations.

(b) Balance of Payment Problem

The value of oil and gas imports in 1970 was $2.7 billion. Utilizing the Interior Department projections in 1985 the value of these imports could amount to $25 billion, a ten-fold increase. To the extent that oil

shale can be used to substitute for increased imports the U. S. balance of payment problems will be mitigated.

(4) An oil shale industry will bring many benefits to the Rocky Mountain area. Economically, the development of a shale industry in the Rocky Mountains will provide positive benefits to the economy of the area through the creation of new jobs, and a significant increase in the goods and services that would be required to support development of an oil shale industry. New employment opportunities through lowering the unemployment rate and increasing medium family income should help to improve the economy of the area.

It is forecast that the Rocky Mountain area, PAD District 4, as a result of declining production in the area, would become a net importer of crude oil by 1977/78. A growing shale industry would reverse this trend. Also, we believe that industry will take a positive role in assisting local authorities in their efforts at community development, with the result that increased population, resulting from establishment of commercial plants, will be accomodated by planned development of existing communities. Such planned development attending the growth of the oil shale industry offers opportunities to control adverse environmental impacts and to avoid all the abuses of uncontrolled population growth.

In conclusion, Atlantic Richfield has an active and diversified effort to develop synthetic fuels. It has a reserve base in oil shale, tar sands and coal. It has invested heavily in the development of technology and studies of the environmental impact of commercial oil shale development. We recognize that oil shale cannot be commercialized without some change in the environment, but we are convinced that we will be able to meet, and comply with, reasonable Government regulations to protect the quality of the environment. And, we believe that there are very positive reasons, both economic and environmental, for pursuing the orderly development of oil shale as a supplemental energy source.

MR. DAY: Thank you, very much.

I now call on Colony Development Operation; would you state your full name, please?

STATEMENT OF JOHN S. HUTCHINS

MR. HUTCHINS: My name is John S. Hutchins, and I am the Manager of Colony Development Operation. Colony is a joint venture which presently consists of Atlantic Richfield Company as Operator, and the Oil Shale Corporation. Since 1965 Colony has been engaged in extensive oil shale development. The venture's costs to date total between $40-$50 MM, fully funded by private industry. Our operational experience and studies exceed any other effort to date in this country.

Let me amplify on the size and scope of our efforts to date. A major part of our current development program has involved itself with environmental concerns. In the last 3 years alone, more than $2 MM has been invested in extensive environmental studies...many of which are now

completed. Individual project studies range over the entire spectrum of environmental concerns and are as diverse as transportation, control of emissions, soils, wildlife, existing vegetation and revegetation, water and community planning. One group of studies provides an ecological inventory and impact assessment of the area affected by a commercial plant. It is being done by an independent, interdisciplinary ecological team, and covers aquatic, terrestrial, wildlife, scenic, sociological, archeological and many other aspects to determine the effect on the existing ecosystem. These studies will provide information which any responsible industrial operation should have as imput to a commercial plant decision.

With this background, we at Colony have carefully reviewed the Department's Draft Statement, and we congratulate the Department on a sincere and excellent effort on a complex and far-reaching subject. In a document as extensive as this, there are always areas that could use additional clarification. Due to limited time, I will make only a few highlighting comments here today...comments which will be supplemented later with written detail. We suggest the following areas for review and reinforcement in the Final Draft:

1. Water. On this subject, the Statement assumes that development of a full-scale oil shale industry of approximately 1 million BPD could increase the salinity of the Colorado River System by 1.4%[1]. Increased salinity need not occur with development of a commercial oil shale industry. Such an industry could, in fact, improve the quality of the Colorado River System.

1 - Page III - 39, Vol. 1

The Statement figures were developed on the assumption that water removed will be pure without containing salts. This does not take into consideration several important factors.

First, a commercial plant, as a minimum, should operate on the same basis as any other user whether municipal, agricultural or industrial...and use water containing its proportional allied solids.

Second, commercial plants must be designed to utilize water with maximum dissolved solids which occurs only during a few months of low runoff cycle. A plant then has the capability during many months of the year of accepting lower quality water than is contained in the river. This is a target of opportunity--substituting low quality water in place of higher quality river water--but it depends upon many things such as a plant's specific location in relation to available low quality water. However, from an ecological standpoint, this realization could maximize utilization of low quality water, leaving in the stream the purest water to enhance the downstream quality.

Third, almost one-half of the water required for a commercial plant is associated with the moisturizing and disposal of processed shale which, at least in the Tosco II process, can utilize low quality water. So we have another target of opportunity...utilizing high saline water from nearby tributaries or mainstream flows to enhance remaining river waters.

Fourth, there is substantial evidence that increased future industrial water usage in place of equivalent irrigation rights can result in reduced salinity in the Colorado.

Fifth, salinity analyses assume that no water is available from a mine or other sources. This is not the case, and indeed the Draft Statement itself shows[2] that a first plant diversion could be as low as 530 AFY, 1/10th of that used elsewhere in the Statement in calculating an increase in salinity.

Let me conclude this point with a quick reference to water consumption. Although by legal definition the figures given for a proposed commercial plant are totally consumptive, from an ecological standpoint plant diversions are far from being totally comsumptive of water. More than 50% of a plant's water use is continuously being returned to the ecosystem through evaporation and other means.

2. Mine Safety. I suggest that the material[3] on this subject be completely re-evaluated. The reason being that the date given is based solely on coal mine surface experience during the years 1960-1969. They are based in part on many small out-moded mines and also occurred prior to the development of strict Federal and state regulations. The best answer to these figures is the Colony experience. We have engaged in mining of shale since 1965. We have removed 1,300,000 tons of oil shale. And we have had no fatalities and only one lost-time accident... a broken ankle, back in 1966. This shows oil shale mining can be done safely, and that fears in this area are unfounded.

3. Plant Air Quality. Just a brief comment here. Page I-58 of Volume I opens the question on the economic advisability of removing sulfur from product gases prior to their use as plant fuel. Obviously, with today's emission laws and regulations this is almost a moot question.

2 - Table III-6, Vol. I
3 - Page III-87, Vol. I

Any oil shale plant must comply with all existing regulations. Therefire, necessary sulfur will be removed.

4. Dust Control. Colony's experience in crushing and conveying raw and processed shale in our Parachute Creek facilities indicate the Statement's "fugitive" dust figures to be high.[4] We are confident contemporary techniques for enclosing crushing activities will provide adequate controls on dust.

5. Regional Air Quality. There is a popular misconception, Mr. Examiner, that a Federal leasing program, together with development of private lands, could mean an immediate 1 million per day shale industry. This is simply not the case. Substantial lead times are involved. It is likely no more than one or two plants will be started within the next few years. That experience--mechanical, economic and environmental--will be fully reviewed before our plants begin. Commercial oil shale plants represent sizeable investments somewhere between $250 - $400MM depending upon plant capacity. The construction period alone consumes two to four years, thus the region will have ample opportunity to evaluate any significant danger to regional air quality. We feel the Federal Leasing Program phased development together with Federal and state laws and regulations on air quality will help avoid crisis planning with all its potential for ignoring environmental constraints if the decision to proceed is delayed until the energy crisis deteriorates further.

6. Special Land Use Areas. One of the migitating measures discussed[5] is the exclusion of certain presently-designated special land

4 - Page III-50, Vol. I
5 - Page IV-2, Vol. I

use areas. I suggest, Mr. Examiner, there should be additional limited areas placed in a permanent scientific reserve system. The best representative stands of each major vegetation type should be preserved, as should major aquatic and wildlife habitats, geologic and archeologic sites of major importance. Setting aside unchanged a very small percentage of surface lands containing ecological baseline areas will provide invaluable reservoirs of original landscape against which, among other things, the effect of the shale industry on the environment can be measured.

7. Pipeline Alternatives. Any consideration of routes through wilderness or roadless lands as defined in the Wilderness Act,[6] and through extraorginarily rough topography should be eliminated. But not simply because of the cost factor. The potential for environmental disturbance in overriding. Any critera should include considerations for the aesthetic impact, scientific value of the area, vegetation recovery rates and effect on wildlife...as well as potential use of Federal lands by the Public. The goal should be to blend the pipeline right of way as completely as possible into the surrounding ecosystems.

8. Reclamation of Processed Shale. It is our experience, fully demonstrated, that reclamation of processed shale disposal areas is unquestionably feasible. Colony's vegetation investigations began in 1967 as soon as disposal product was available for this purpose. Under the continuous guidance of research agronomists, we progressed from, first, greenhouse studies into test plots on location to test several alternatives anticipated in temperature, solar radiation, rainfall and

6 - 78. Stat. 890, 16 U.S.C.A., Sec. 1131

slope exposure. A broad range of grasses, and a few shrubs and trees, have been investigated. These investigations indicate that a Tosco II processed shale pile, properly revegetated, after a period of maintenance, can be self-sustaining and as productive to wildlife and other elements of the ecosystem as the natural soils of the area.

9. Plant Water Disposal. Commercial plants designed by Colony will not discharge any process water into the surrounding watershed. Rain or snow falling on the plant area will likewise be isolated and returned to beneficial use in the process and isolated from entering the watershed. Colony will support general regulations for industry performance to operate responsibily within the water environment.

Let me say in summary I am somewhat unconfrontable with the brevity of my remarks today. I want to emphasize my comments have been general and are in no way meant to be exhaustive on any point. We will detail separately in writing additional facts and supportive data which will be helpful to the public and to the Department in preparing its final statement.

Again, on the Colony participant companies, let me applaud the Department's efforts and thank you for this time before you today.

MR. DAY: Call on John Tweedy, the Oil Shale Corporation

STATEMENT OF JOHN B. TWEEDY

MR. TWEEDY: Mr. Examiner, I want to thank you for the opportunity to be here today.

My name is John B. Tweedy. I am appearing today as Executive Vice President of the Oil Shale Corporation to comment upon the Draft

Environmental Statement for the Proposed Prototype Oil Shale Leasing Program prepared under Section 102(2)(C) of the National Environmental Policy Act.

So that my remarks may be understood in proper context, I want to state for the record the interests and background of the company I represent. The Oil Shale Corporation, whose trade name is TOSCO may be more familiar to you, is a publicly held, private corporation. It is the owner and licensor of the TOSCO Process, a retorting process for the extraction of oil from oil shale. As a participant in Colony Development Operation, TOSCO and it coventurers have conducted extensive field operations utilizing the TOSCO Process including the operation of a 1,000 ton-per-day semi-works plant and mine at Parachute Creek. These activities have demonstrated the feasibility of the process and developed satisfactory solutions to environmental and other related problems. That operating experience which began in 1964 and included the mining of more than one million tons of ore by TOSCO and its partners, is the basis for my remarks today.

Prototype Leasing Program: A New Concept in Environmental Testing

The Proposed Prototype Oil Shale Leasing Program as set forth in the Draft Environmental Statement embodies a totally new concept in the development of public lands. Its object is to permit testing of oil shale operations under strictly monitored conditions to determine with certainty the environmental effects of commercial oil shale production and to determine the adequacy of environmental controls. This

feature, which cannot be over-emphasized, distinguishes the proposed oil shale program from any other Federal leasing program.

The testing will occur on carefully selected tracts which represent less than one-half of one percent of Federal oil shale lands. The opportunity for the State and Federal governments, public interest groups, and industry to review the results of these commercial sized operations will insure a high degree of protection for the public interest. We approve this unique and pragmatic approach to public lands development.

We believe that the Draft Statement has covered in remarkable depth the impact of prototype leasing program. Its treatment of the impact of a mature industry, by its very nature, must be less detailed. This contrast emphasizes the very purpose for which this prototype program has been devised, which is to develop data from which a more accurate forecast of the impact of a large-scale industry may be drawn.

Comments on Draft Environmental Statement

Our partner, Atlantic Richfield Company, for itself and as Operator of Colony Development Operation has already commented in some detail on the Draft Environmental Statement. TOSCO concurs in and adopts those comments and shares the view that the Draft Statement displays a high degree of professional competence and thoroughness. We think the Department should be commended for the quality of its work.

We are, however, concerned that the very thoroughness of the discussion of possible environmental impacts in the Draft Environmental Statement may give the erroneous impression to the casual reader that

many of the less desirable possibilities which are discussed may actually occur. For example, if not read in conjunction with the remainder of the Statement, in several places the Draft describes environmental impacts which are physically possible, but which would not be permitted under existing Federal and State laws and which can be adequately controlled as has been demonstrated in oil shale operations and other conventional industrial applications.

As an example, in Volume III (Page IV-32), it is stated that up to 40 tons per day of fugitive dust might be emitted from each oil shale processing facility. In fact, as Volume I (Page III-47) correctly points out, control procedures could limit air emissions of dust to one percent of the possible level discussed in Volume III. In addition, Colorado air pollution control regulations would not permit the emissions referred to in Volume III and dust control procedures used in oil shale operations by Colony have successfully demonstrated that such regulations can be met.

While other similar examples might be cited, because of the time constraints upon oral testimony, I will not enumerate them at this time. They are matters of detail involving minor discrepancies that are almost certain to occur in any extensive discussion of a complex subject. As previously indicated, ARCO and TOSCO are submitting, through Colony, amplification of such matters together with a substantial amount of related data based upon our operating experience. We hope that such information will be useful to the Department in the preparation of the Final Environmental Statement.

Mr. Tippit has pointed out today, and the representative of Equity Oil Company has dealt at greater lengths with the apparent lack of discussion of the Rio Blanco Project, and it's possible conflict with oil shale development. I think it's worth stating here some of the basic salient facts which characterize that potential conflict. Data generated by the Bureau of Mines and presented in public hearings clearly establishes that the energy reserves and the oil shale contained in the Rio Blanco unit are 100 times the magnitude on a BTU basis of the value of the gas reserves which will be tested by the Rio Blanco unit.

There are conflicts between the development of oil shale reserves and the gas development through nuclear stimulation, only if it is insisted that the nuclear stimulation project preceded the oil shale development. Now the details of that program contemplate 280, I believe, separate nuclear shots within an area of 140 square miles. This means more than two separate detonations of three nuclear devices each, per square mile. The conflict that becomes obvious when you consider the impact upon the 300 million dollar facility situated close to that kind of detonation; on the other hand, if the nuclear stimulation takes place after oil shale, the recoveries can be as great as they were originally, and can be conducted without any interference whatsoever.

Mr. Tippit commented on the conflict with oil and gas development. This area has been the subject of exploration by conventional means for many years. The AEC in its published statement, Equity Oil Company, all have stated publicly and for the record that conventional means of developing gas in the Rio Blanco unit are not now and never

have been feasible.

Now it may well be in the future there could be additional liquid reserves, but in the many hearings and discussions on this subject which have been conducted privately and publicly to date no one has raised the issue of a potential conflict between the recovery of liquid oil and oil shale development.

This subject, I'm sure, is one that can be profitably expanded on in the final Draft Statement and, in this respect, I concur with the comments of the earlier statements.

As a final comment, let me turn briefly from the adverse impacts which, of necessity, must be considered in a NEPA statement, to the potentially favorable impacts that can arise from oil shale development. In addition to the benefits to national security, our balance of trade and the clean energy source discussed by others, oil shale development will maximize the use of otherwise low value lands and provide an opportunity for the dispersal of Colorado's population. It will also provide new jobs, increased incomes and a higher standard of living to a region which is now substantially below the national average.

The Oil Shale Corporation has, as a matter of policy, viewed the solution of environmental problems as being no less important than the solving of technical process problems. Although neither the Draft Impact Statement nor the Prototype Oil Shale Leasing Program to which it is directed are perfect, yet in their design the Department has provided--perhaps for the first time in the economic history of man--a rational system for the development of a new industry under controlled

conditions which will minimize undesirable environmental consequences. This effort deserves our wholehearted support.

Thank you, Mr. Day.

MR. DAY: Thank you very much, sir.

Do we have a representative from the American Petrofina Company of Texas?

STATEMENT OF JOHN MORAN

MR. MORAN: My name is John Moran, Jr., and I'm an attorney. I practice in Denver and I appear here on behalf of American Petrofina, Incorporated.

American Petrofina was incorporated in 1956, stock traded on the American Stock Exchange and markets its products principally under the name of Fina in 24 states, including Colorado, Utah, and Wyoming. Fina's oil and gas production is from Arizona, Texas, Oklahoma, Kansas, New Mexico, Wyoming, and Colorado. For some years American Petrofina has been a leader within the energy fuels industry, in the installation of facilities at its refineries to abate air and water pollution.

As the technology for air and water pollution control has developed during the past several years, American Petrofina, with approximately 8/10ths of 1 percent of the refinery capacity of the United States has averaged the expenditure of approximately 1 million dollars per year for air and water pollution control facilities.

Since 1968, Fina has installed systems for treating water and removing sulfur, particulate matter in smoke, the vapor streams of its refineries. Accomplishments on behalf of Fina demonstrate that it is

this kind of company that considers responsibility to carefully care for and treat the environment. For the past 10 years or so, American Petrofina has been interested in the development of synthetic fuels, either or all tar sands, coal, or oil shale. Since 1967 the company has retained the services of engineering consultants in Denver who have assisted the company to become fully informed on the problems and potentials of a shale oil industry, and evaluation of all factors available to it, leaves American Petrofina to conclude that the development of a Shale Oil Industry should commence.

After the Department of the Interior announced the Prototype Oil Shale Program in June of 1971, American Petrofina participated with others in the functions of an exploration area of Piceance Creek Basin in Colorado. Under such program, 9 wells have been drilled through the oil shale section which has provided information related to oil shale, assay values and volumes of oil shale, overburden and innerburden and quality and quantity of ground water in the area. Preliminary analysis of such data led American Petrofina to submit, with others, a nomination to certain federal oil shale acreage in Colorado, in January of 1972. Such tract is known as Tract CA, and was selected by the Department of the Interior for further consideration under the lease program and evaluation of the tract continues.

American Petrofina participated in the funding of an environmental inventory study of Piceance Creek Area in Colorado. Such study was prepared by investigation and adjustment and was made available to the Department of the Interior at the time the tract nominations were

submitted in January of 1972.

American Petrofina has also participated in the funding of a $715,000 study of the Piceance Creek Basin. This study is being financed jointly by the Federal government, the State of Colorado, and the Colorado counties of Rio Blanco, Mesa, and Garfield and by private industry. The studies are currently in progress and are scheduled to be completed prior to the time a detailed development plan with lease tracts become available or finalized.

There is before the Panel the Draft Environmental Statement for the Proposed Prototype Oil Shale Leasing Program. The statement at Page 8, Vol. II, substantially documents the Nation's present and future energy requirements and the call upon the various major energy sources in the near term, in the intermediate term, and in the long term stretched from the near term, 1975, through the long term in the year 2000.

Recognizing that there are many factors to be considered in forecasting further energy demands, it is that in the near term intermediate and in the long term the oil and gas industry will be called upon to furnish in excess of two-thirds of the nation's energy. That may be documented by reference to Page 12 of Vol. II. But with ever decreasing known source of supply occuring in reference to this requirement to furnish the energy, if one is to believe the forecases in the Statement, and there's no substantive evidence they are not true or that we have at our disposal the means to alter the future outlook, it is mandatory that we not only make intelligent use of what we now have but

that we provide for the future demand. Failure to do so will present us face-to-face with an energy crisis. Some would say that the crisis has already occurred; relying on the statement itself, the crisis is imminent. Indeed, it is already known as cited in the statement at page 13, Vol. II, that natural gas will be subject to supply limitations, but the Statement on Page 39, Vol. II, is emphatic when it notes that all of the Nation's excess crude oil providing capacity at the current levels of import will be gone by 1973 at the present trend of consumption.

The decline in domestic oil and gas supplies are, of course, a result of increasing demand and also result from lower discovery rates, an integral part of the nation's systems undertaken to provide the necessary reserves to assure a reliable energy source.

In applying for a lease of Federal oil shale acreage, the industry, of which American Petrofina is a member, is seeking to provide the Nation's demand. The implication of not developing oil shale as an energy resource has been summarized by the Assistant Secretary of the Interior, and if we do not get busy on the development of oil from oil shale, I think we are going to see the cost of energy rise very rapidly.

Oil from shale can set the cost of energy in the United States, it can put a ceiling on the price. What with American demand for fuels and energy continuing to grow at the rate of about four percent per year, an increasing portion of that demand now has to be met by foreign imports of oil. This puts the United States in a deteriorating bargaining position. This does not have to be when we have this much muscle in oil shale, it's our muscle and time reflects it, as it will take 15 years

to develop a one million barrel a day industry.

The 15 companies which submitted nominations under the Proposed Oil Prototype Shale Leasing Program also submitted, along with their nominations, exploration data and environmental reports relating to their individual choice of tracts. A significant accomplishment requiring substantial sums of money. The Department of the Interior is to be commended on the comprehensive and detailed analysis of this information. Further, the Department's analysis of alternative sources of energy, with the description of their projected impact on the environment indicates a full appreciation of the energy situation.

As pointed out at Page 64, Vol. II, of the Statement, if the current oil shale program continues, time will allow development of methods to protect the environment; a delay or postponement could result in a crash program which would not provide sufficient time to evaluate effects on the environment.

American Petrofina considers the proposed Prototype Plan to be an acceptable vehicle through which to begin the development of Federal oil shale lands and thereby to effect a protection for the environment. American Petrofina urges that the endorsement of the currently proposed oil shale leasing program and the acreage directed by the Department of the Interior to be leased thereunder be provided in accordance with the plan.

On behalf of American Petrofina, gentlemen, I wish to express its appreciation for allowing us to appear here today.

MR. DAY: Jorge E. Castillo, from the Sierra Club?

STATEMENT OF JORGE E. CASTILLO

MR. CASTILLO: Mr. Examiner, my name is Jorge E. Castillo, and I'm appearing here today on behalf of the Sierra Club. We intend to file a written statement setting forth in more detail the views that I will attempt to express here.

First, we think that the action which is proposed with respect to the development of oil shale is one that has far-reaching effects not only so far as the states involved are concerned, but also insofar as the National energy policy.

We think that by proposing this action the Department of the Interior is, in substance, bringing about a commitment by the Nation that we will seek to satisfy the energy needs in the 1980s and beyond out of fossil fuels.

Initially what is proposed is a prototype program; supposedly the prototype program is to make more precise determinations as to a number of things, such as technology involved, such as the environmental impact. Now what happens if the prototype were to disclose that the environmental detriment is greater than anticipated? What other alternative courses of action there would be? No one has mentioned this and it is not mentioned in the Draft Statement.

Since the time that we have today is limited, we merely would like to point out some basic objections that we have to some of the matters that are contained in the Draft Statement. First of all, in the area which has to do with the alternative energy sources, there's a short discussion in Volume II, at Page 187, as to other, cleaner energy

sources. These energy sources are dismissed as not being technologically capable of supplying the additional fuel that is to be used in the 1980s.

Now from what has been said here today by a number of the witnesses on behalf of industrial concerns and from a number of other considerations, we have considerable doubt that the technology that exists today is adequate to fulfill the projections that the Draft of the Statement makes; that is, we don't think by year 1985 the oil shale industry will be in a position to produce the amount of oil that has been projected.

The proposal that has been made is to the effect that we are going to be committed to look for that additional oil in the 1980s out of oil shale, the tremendous amounts of money that will be spent, the great environmental damage that will occur, are somewhat, to a lesser or greater extent, discussed in the Statement. Under Section 1 and 2 of the Act, we think that Congress intended--the Department of the Interior in this particular case--should explore more meaningful alternatives to the action that has been proposed, and we don't think a meaningful alternative is merely to say that solar energy does not have, now, the technology. We think that the Department of the Interior, because of the nature of the commitment that would be made if this action is carried out, that it should, in detail, explore what it would take for a crash program designed to determine whether or not it would be feasible to produce energy from solar sources.

We think that Section 102 requires the Department of the Interior to, in detail, give a meaningful comparison between the environmental impact than would flow from the development of solar energy sources, so

that one, either the public or the Department of the Interior, could make a meaningful comparison between the environmental impact and the cost on the one hand of the action which is proposed and the cost and the environmental impact of getting energy from solar sources.

To us, this is one of the basic flaws in the Environmental Impact Statement that has been prepared. We think also that there are a number of other problems which are important and which perhaps, do not lie at the very foundation of the action proposed, but which are inadequately explored in the Statement.

For example, with respect to water, in Volume I, Section 3, Page 39, there is a statement concerning the fact that there will be an adverse environmental impact through decreasing water levels and partition pressures on aquifers associated with the mine water; but there is nothing said as to what the impact is, there's no statement made, no investigation made here as to where, for example, what is the environmental impact on agriculture, for example, of water which would be used for oil shale purposes. There is hardly anything said about the contamination problem resulting from salt water on fresh water aquifers. It merely says it could result but there's no intelligent, meaningful statement that would enable anyone to make an assessment as to what the effect of that contamination is going to be.

There's mention made in the Statement about the impact of increased water use by oil shale development connected ommmunities. It's just merely mentioned, but what that effect is is not mentioned anyplace; where that water is going to come from is not mentioned any-

place.

We think that these are material aspects of the environmental effect of this proposal and we think that the gravity of the environmental--of the Interior Department--is inadequate in terms of treating those problems. We think that, generally, the Interior Department should go back and re-examine each and every one of the items that has been mentioned in the report and amplify so that a meaningful statement as to what the impact is will appear in the next draft, and that after discussing these items in detail, that a further opportunity be given to the public to express their views concerning the Statement.

So, in summary, we think that it is important that a meaningful alternative energy source be provided in detail, with estimates as to cost, and secondly, that as to the items that have been recognized as being part of the detrimental effect upon the environment, that further elaboration is necessary and that the Interior Department should go back and do that.

MR. DAY: Was your first reference to Volume II, earlier in your talk? Would you give me the page of the statement to which you referred?

MR. CASTILLO: Volume II, Page 187, under "Other Energy Sources."

MR. DAY: Thank you.

Mr. Tom Stocker?

MR. CASTILLO: Mr. Stocker cannot be present today.

MR. DAY: Thank you. I'll call on Dr. Theodore Ellis, also

representing the Sierra Club.

STATEMENT OF DR. THEODORE ELLIS

DR. ELLIS: Mr. Chairman, my name is Theodore J. Ellis. I'm an Assistant Professor of Economics at Adams State College, Alamosa, Colorado, and I'm going to present a statement of the Sierra Club.

Mr. Chairman, I have recently completed a doctoral dissertation for the Colorado State University on the various aspects of the oil shale issue and, in this statement, essentially I'm trying to summarize the conclusions I have reached in that study; however, the statement is rather long. I'll try to summarize it, but I wish to have the statement in full presented in the record; also a copy of my dissertation can be reviewed at the Conservation Branch of the Denver Public Library, if anybody is interested.

Much has recently been said about the existing or intended energy crises; there are contentions that we are presently uncovering the bottom of the barrel, of the United States rapidly becoming a finished nation in terms of energy supplies. Nothing, Mr. Chairman, could be farther from the truth. The United States is not approaching economic exhaustion of any of its energy resources; we are, however, faced with a rapidly expanded energy demand and growing problems of supply. We have witnessed a shortage in increase of supply, environmentally acceptable fuels and, as a result, energy issues have received much attention and become national issues.

Within this framework it is said to meet the mounting energy requirements we must develop oil shale, that the domestic petroleum

supplies must supplement with the synthetic group of fuels in the production of our shale oil. Consequently, shale oil becomes a national and regional issue which is very important, particularly in view of the impending decisions concerning this resource.

A rational policy towards production requires that we be fully informed about the consequences of alternative possibilities of action, and to this effect, I'm going to concentrate on specific issues concerning oil shale, particularly on the realities concerning the physical extent of the oil shale resource. Is shale oil production economically feasible? Is it presently environmentally viable? Disregarding economics or environment, what will the potential contribution of shale oil be to the potential future US energy requirements? And what is the role of presently proposed leasing programs to this effect and at the end what, in my opinion, constitutes a rational approach or strategy to the shale oil issue.

Again, with the first point, it has been stated that the oil shale deposits are indeed enormous. The United States Geological Survey estimates that the oil in shale is at least 1,550 feet thick and contains at least 15 gallons per ton, amounting to one and three-quarter trillion barrels. Observers usually over blow the physical availability of this resource and tend to speak of a multi-trillion dollar resource whose development could be a bonanza of revenues to the federal government and also the oil shale states involved; however, according to present technology and present market conditions, only a small amount of oil shale could be recovered, could be made available.

The United States Joint Survey indicates a figure of about 80 billion barrels, while the National Petroleum Council assumes a higher quality of oil shale, 35 gallons per ton or more, believe only 20 billion barrels recoverable reserves could eventually become available; thus, the potential realization of extensive revenues on the Federal and State level is, at the present time, a vision.

Second, in terms of economics recent figures by the Bureau of Mines and the National Petroleum Council shows that rates of return can be considered only marginal or sub-marginal at best; it's not clear to what extent this projection includes environmental protection costs. It is known that oil shale development has the potential of extensive side adverse effects, which must be taken into consideration, but at the present time the environmental control technology has not been demonstrated on a commercial scale. We do not know what constitutes a level of adequate environmental safeguards and what it would cost to implement it. Consequently, if you add to the very marginal prospects of oil shale production, environmental protection costs, the economic outlook for production from oil shale appears even more discouraging.

It has been said that voluntary action on the part of private industry is enough to take care of the adverse effects on the environment; the main objective, however, of private industry is to enhance its profits, its growth and its stability. To the extent that they are interested in environment and environmental effects, they do so either in anticipation of future controls or for public relations purposes. In either case, would such interest be sufficient or would it require

monetary controls, mining regulations to protect dangerous and other interests and other values involved in the area?

The environmental protection costs must become an integral part of the oil production for oil shale, but disregarding economics and disregarding environmental effects and assume that oil shale could be developed at all possible speed, what could the potential contribution of oil shale be to the future U. S. petroleum requirement? The Department of the Interior projects an estimate of one million barrels per day. This is a cumulative production capacity that could be installed by 1985. If we compared this to projected petroleum demands for environment of between 23 million barrels per day to 26 million barrels per day estimated, presented respectively by the Bureau of Mines and National Petroleum Council, the full potential of one million barrels per day is only around 4 to 5 percent.

The National Petroleum Council appears even more pessimistic and states that even if the economics and even if the governmental attitudes are favorable, shale oil production can only amount to 400,000 barrels, which total demand is only well below 2 percent. According to this, Mr. Chairman, shale oil neither is now nor is capable of significantly contributing to the U.S. petroleum requirements in the next 15 years.

The Secretary of the Interior has noted just recently by stating oil shale cannot contribute significantly to our energy supplies until after the 1990s, and maybe beyond the year 2000. What is the purpose of the presently proposed leasing program to this effect? The

Department of the Interior proposes to offer 30,000, roughly 30,000 acres of rich oil shale lands presently under Federal control for the purpose of stimulating research and development in oil shale. It is a fact, however, Mr. Chairman, that lack of accessibility to the Federal oil shale is neither a significant nor an important factor inhibiting oil shale development at the present time. According to the National Petroleum Council, deposits of the very highest quality under private control amount to about 6 billion barrels and these are enough to support fifteen 50,000-barrel oil-shale plants for their economic life of more than 20 years.

In addition, the presently proposed leasing program does not establish a mandatory production requirement. A company could obtain a lease and hold on to it provided they pay what's required. A former Department of the Interior official has estimated, in addition to the bidding bonuses, it would cost an oil company about $83 per acre per year to hold onto the lease and do nothing. And so, for two reasons first, the private deposits are quite extensive and the highest quality and could be developed without a leasing program; and secondly, the presently proposed leasing program does not entail any mandatory requirements. For these two reasons, the prospects for success of this program are rather dubious. It will result probably in more exploitation of Federal oil shale lands but will not stimulate or speed up oil shale developments in any manner.

In view of the above economics, straight economics, or marginal or sub-marginal, and if we include environmental protection costs it

will become--it will even deteriorate farther. And the fact that oil shale in any case will proceed at low speed, and will not be able to deal with U. S. petroleum requirements. The present proposed leasing program will not encourage or stimulate oil shale development. What should a rational policy be according to my opinion? According to the people I represent--

MR. DAY: Would you please sum up in 30 seconds?

DR. ELLIS: Essentially, I recommend government, direct government involvement, either unilaterally or in cooperation with private industry in building a commercial size oil shale plant. This will enable the Government, first, to test economics and establish the value of the Federal oil shale lands before they formulate a leasing policy.

Secondly, it would enable them to study the extent, nature, and scope of the environmental effects and establish adequate environmental protection standards, for any future leasing programs; and third, it would allow the Government possibly to test alternative development processes for oil shale, and by doing so, to close the important information gap we now have before formulating and implementing a future oil shale policy. That concludes my statesments, Mr. Chairman. Thank you.

MR. DAY: You cited a number of statistics, I trust they'll be documented in your exhibit?

DR. ELLIS: They will all be included in the Statement in detail.

MAURY TRAVIS

Mr. Chairman, thank you very much for the opportunity of being

here. I have been waiting twenty-five years to make this presentation. I am formerly with the United States Geological Survey, Conservation Division, Mineral Classification Branch, District Geologist, 1952 to 1956, Northwest Region, Headquarters, Canada to New Mexico.

This is titled Air Pollution. The undersigned gave the first scientific address on air pollution in Colorado, December 9, 1949, before the Colorado Society of Safety Engineers, State Capitol Annex, Industrial Hearing Room, Colorado Industrial Commission, 14th & Sherman Streets, Denver, Colorado. This was updated April 8, 1966, at their invitation before the Metropolitan Denver Safety Council Engineer's club, 1380 South Sante Fe Drive, Denver, Colorado.

Title, U. S. Bureau of Mines, Oil Shale Refinery, Anvil Points, Rifle, Colorado and mining operations above Bookcliff. The title of this testimony is as follows: the myth of so-called, misnamed oil shale. The undersigned personally visited the U. S. Bureau of Mines Oil Shale Refinery and mining operations at Anvil Points near Rifle, Colorado by chartered Monarch Airlines, October 2, 1947, in company with sixteen engineers and geologists representing the American Institute of Mining and Metallurgical Engineers. Thus, with his background, 1952 to 1956 as District Geologist, U. S. Geological Survey, which included oil shale operations Canada to New Mexico the undersigned has watched developments of this natural resource from 1947 to 1972, some twenty-five years.

In addition, I have had 45 years continuous background in the liquid fuels petroleum industry beginning with the year 1926,

representing three major oil and gas companies, dozens of independent oil operations, also, the Federal Government with the Federal Power Commission and the U. S. Geological Survey.

Nomenclature of So-Called Misnamed Oil Shale

So-called, misnamed oil shale is not oil, not shale and not commercial. As the undersigned reported September, 1969, before the Rocky Mountain Association of Geologists in a newsletter, also mentioned in a public address on August 10, 1968, in a meeting before the Rocky Mountain Association of Geologists in Denver.

Oil Shale or Sale Oil

Nonmarine microscopic aquatic lake algae deposits in limestone, not shale, although containing hydrocarbons are more correctly termed a "kerogen," from the Greek, meaning waxy substance. This waxy algae when distilled in refinery operations, necessary at the site of mining operations, is solid at ordinary surfaces. This is liquid only at high temperatures, ranging to 900 degrees Fahrenheit, requiring separation of liquid hydrocarbons from the waxy algae. Thus, there is no relation between the nonmarine aquatic lake algae, the so-called misnamed oil shale or shale oil and the true oil or petroleum of marine origins, which is the lifeblood of national and international petroleum commerce, produced naturally at the well, with or without associated gas, available immediately for pipeline or other transportation to distant refinery sites. Furthermore, so-called oil so-called oil shale or shale oil is not competitively commercial with liquid marine fuel oil discovered in 1859 in Pennsylvania and 1862 in

our own Florence, Colorado. At no time has shale oil hydrocarbons been a part of domestic petroleum production and international operations exist only as a subsidized, costly substitute where true marine natural oil is not available in sufficient quantities such as in Scotland, Australia, and Brazil.

Water

Costly substitute, oil shale or shale oil requires enormous quantity of water which is not available in semi-arid Western Colorado. This was confirmed on April 5, 1970, by the Denver Research Institute.

Drought

A catastrophic global drought, 1971 to 1977, is now in its second year exempified by the worst drought in 100 years in Soviet Russia Creating its worst agricultural disaster in modern times, forcing the USSR to purchase one billion dollars grain from the U.S. which had its own drought beginning in 1971 in the Southern States, Florida to California, somewhat further south of the wheat region and it would appear that that drought condition will peak sometime in about 1975 as predicted by the Smithsonian Institution there is no hope whatever for a viable substitute such as Oil Shale before 1980. This would be after the drought measures had been alleviated and restoration was accomplished in the very late 1970's.

Thank you very much for the opportunity to make this presentation.

MR. DAY: Thank you. I think this is a good time to take

an hour off but I would like to add before we do that that there are additional people who have applied and who just wrote us a letter stating that they would like to testify and we don't know whether they will show up. We will wait until this afternoon and see what happens. At this time we will recess and we will reconvene at 1:00 o'clock.

(Whereupon, at 12:00 o'clock noon the hearing was recessed to be reconvened at 1:00 o'clock.)

AFTERNOON SESSION 1:30 p.m.

MR. DAY: The Hearing will now come to order.

CAll on John W. Rold on behalf of the Colorado Geological Survey.

STATEMENT OF JOHN W. ROLD

MR. ROLD: My name is John W. Rold. I am State Geologist and Director of the Colorado Geological Survey and speak for that agency. The Department of the Interior is to be complimented for an excellent analysis of the potential oil shale development and its possible impact on the environment. In our job, we review many 102 Statement by numerous organizations, and this is one of the best we've seen. Obviously, from the comments made today, though, this statement is not perfect and it would probably be impossible to write one acceptable to all points of view this side of heaven. To our knowledge, this is the first determined effort to evaluate and minimize the environmental effects of a major industrial development prior to the inception of that development.

I have only two points to make today about the environmental

statement. First, the casual reader or one who's not familiar with the area may, because of several comments, get the somewhat distorted impression of just what the "oil shale country" consists of. The photos on pages II-41, 42 & 43 (Vol. I) of Trapper's Lake, above Timberline primitive areas and high country snowmobiling. Certainly these are not pertinent to the question at hand and are misleading. Similarly, the recitation of recreation potential in Rio Blanco County (II-88) applies to an area completely outside the oil shale area. The recitation of fishable waters and trout streams on pages II-28, 29, 31, 32 & 33 is also not pertinent to the problem. They will mislead the reader unless the statement should also point out that only a few miles of small streams in the oil shale region contain fish and that even that habitat would be little affected by the proposed action. On page II-25, inclusion of moose habitat for the region conjures an erroneous impression of the area. Figure II-14 seems to refute the statement. The wildlife habitat maps II-9, 10, 12, 13, and 14, are difficult to use, even for one used to using maps, and cover considerable area which is not pertinent to the question. Without careful plotting of areas by the reader, they too are misleading. I would suggest redrafting of that material at a more suitable scale, showing the oil shale outcrops and the 6 sites in question in the 102 Statement. The citation concerning Rocky Mountain sheep and bison on page II-75 should be verified and qualified.

In describing the aesthetics of sites Ca & Cb, the roads and man's past and present activity is definitely understated. Roads

and vehicle trails extend along nearly all ridges and valleys. Much of tract Cb has been chained to destroy the pinon & juniper trees. Even the air photos and topographic maps II-4, II-6, II-7 & II-8 give a truer impression than the discussion. Usage of the term "semi-wilderness" on pages V-2, V-5 and elsewhere to describe the area would stretch most people's definition of term.

Secondly, although on-going studies are briefly mentioned on page I-74, 75 (Vol. I), it should be stressed that considerable additional information will be available for timely use by the regulatory governmental agencies and the industry itself. A fuller discussion of these on-agency studies should allay the fears of many citizens.

In water, for example, the USGS is not only evaluating possible sources of surface and subsurface water as to location, quantity and quality, but is investigating the possible impact of underground water on the various mining operations, and the impact of the entire development on the waters.

In revegetation and rehabilitation, Colorado State University is not only working on the difficult problem of revegetating spent shale, but on the revegetation and stabilization of all disturbed areas, including the plant sites themselves when they have outlived their usefulness.

Thorne Ecological Institute is making an environmental inventory or a baseline of present conditions and an independent evaluation of the environmental impact of each and all operational facets.

A Regional Oil Shale Planning Commission in 3 counties has been setup, and is deriving mechanisms for intelligent decision making to accomodate expected population growth and socio-economic pressures which will result from oil shale development.

Funding for these studies being coordinated and administered by the Colorado Department of Natural Resources amounts to over $700,000, and these funds are being provided on approximately one-third shares by the Federal government, the State of Colorado and private oil industry. Each of the studies will increase greatly the considerable body of knowledge now available.

MR. DAY: Thank you.

I now call on a representative of the Colorado Rivers Council; is there a representative from the Colorado Rivers Council present?

(No response.)

MR. DAY: The Sportsmen's Association, a representative from the Colorado Sportsmen's Association?

(No response.)

MR. DAY: Mr. Richard Ward, Colorado State University?

STATEMENT OF RICHARD T. WARD
Professor of Plant Ecology

MR. WARD: The report that I will give was prepared jointly with Doctor Ralph L. Dix, also a Professor of Plant Ecology, and William Slauson, Plant Ecologist, from our institution.

If oil from the shale is so valuable to us we should be willing to pay for it. Colorado (and Wyoming and Utah) should not, however, be expected to underwrite this energy bill for the rest of

the U. S. The bill will be partly in the form of a devasted landscape--an unfair subsidy to be paid by Coloradoans and her neighbors.

If it is intended that the 3-volume statement under consideration serve as a guideline for the reestablishment of vegetation -- that's what I'll speak to today -- in the oil shale area, one can only comment that it is totally inadequate. It is not clear what should be put back where, how to put it back, nor how to monitor the success (or lack of it) against a standard.

A necessary first step in a reclamation program is to provide an accurate and understandable picture of the existing vegetation as it blends into the landscape. This draft statement is so diffuse and haphazard in this regard as to preclude any possibility of an adequate revegetation effort.

Let me focus on two critical failings:

1. The superficial treatment of vegetation types and how these types fit into the landscape; and
2. The inadequate structural characterization of the vegetation.

First - the vegetation types -

For the Colorado oil shale region the statement lists three primary vegetation types, and five secondary types. The three primary types are: I) Mountain Browse; 2) Pinyon-Juniper; and 3) Sagebrush. Let us consider the first of these -- Mountain Browse. Is that to mean service berry, mountain mahogany, rabbit brush, oak --

and a few others? It doesn't take a trained eye to see in this region the well-defined species-habitat relationships. This is in contrast to a loose mixture of shrub species which one would infer. "Mountain Browse" is a very complex thing, as most deer hunters of the area can tell you.

There are several factors which contribute to positioning of shrub types on the slopes. Steepness of slope, instability, directions of slope, position on slope with respect to drainage patterns, and elevation are good examples of factors which govern the success of species and communities. For example, at several places along Parachute Creek a change in slope of a few degrees produces a change in vegetation visible for a great distances. Also, change in exposure of a few degrees yields a change in vegetation as great as that between a shrub and grass community. None of these factors is more than briefly spoken to.

Think also of Pinyon-Juniper as a type. This is a standard type that everyone recognizes -- but for the area we're talking about it is an inaccurate and misleading designation. In the Piceance Basis there is very little Pinyon! Probably for good environmental reasons. If the environment is in fact not suitable for pinyon it makes a little sense to spend 60 percent of your budget trying to reestablish pinyon and 40 percent for juniper -- which is about what any reasonable person would do using "Pinyon-Juniper" as a reference.

To mention one other type, a secondary type, the "Broad-leaf Tree" type. Do you want to guess whether that is to indicate aspen in

the higher elevations, or willow and box elder along the lowland stream courses? They are not differentiated, but obviously they are associated with very different habitats.

The best approach to understanding reclamation needs is to work out a system of environmental gradients and associated vegetation types. When new habitats are created from oil shale activities, it will then be possible to know what fits best and where. There is no format for this approach in the present document.

The second major point has to do with structural characterization of vegetation. Naming a community doesn't describe it -- in fact, it often leads to erroneous visual impressions which then lead to bad decisions. Listing species helps, but an essentially complete display of component species with the presentation of quantitative data on importance is required for good decisions.

Vegetation is a complex feature of the landscape, with vertical and horizontal spacing characteristics, plant size and shape differences, age and number attributes, and so forth. It has form and dimensions. Detailed information of this sort is an essential part of a reference base line. The report is devoid of such information.

How important are the guidelines I've discussed? They are important enough that unless followed the oil shale area cannot be reclaimed.

The destruction of this landscape is an unreasonable and unnecessary price for the people of this region to pay. It should not and need not happen.

MR. DAY: Thank you. Bruce Hamilton, Colorado State University Environmental Corps.

STATEMENT OF BRUCE HAMILTON

MR. HAMILTON: My name is Bruce Hamilton and I live at 310 Peterson Street, Fort Collins. I am a student at Colorado State University in the College of Forestry and Natural Resources and on the Board of Directors of the Colorado State University Environmental Corps (known as ECO). During the last year I have headed a group of ECO volunteers interested in studying possible oil shale development in Colorado. While I do not speak for all members of ECO, I shall try to articulate what I believe to be the opinion of most members.

ECO feels that oil shale deposits in the Green River Formation could be developed with a minimum of environmental damage. However, judging from the Draft Environmental Statement, it seems very unlikely that the environmental damage will be minimized. We would like assurances--more than we have at present--that the actual or possible harmful effects of oil shale development are minimized, even if additional costs are incurred or if the leasing program is postponed. ECO is not against oil shale development, but we are opposed to this crash program.

We feel that adequate social and environmental planning has not taken place. We feel that the environmental costs have not been objectively investigated nor have sufficient attempts been made to minimize these costs. We feel that the alternative of no development has been considered superficially--as a part of a meaningless exercise

of only appearing to satisfy NEPA's requirements.

ECO plans to raise specific questions about the content of the draft environmental statement in our written testimony.

At this point in time, we would like to address ourselves to the question of public policy. After we have heard arguments for and against oil shale development, after we have heard estimates of economic success and projection of environmental deterioration, the decision will be a political one. Air pollution specialists, mining engineers, wildlife conservation officers and other "experts" can provide excellent information on which to base a decision; but from some other sphere of influence we must raise the more elusive questions involving qualitative aspects of life, intangible values, public interest protection and ethical questions about man's role on this planet. The final decision about whether or not a public natural resource shall be used, by whom and under what restrictions must ultimately come from a consideration of both the technical experts and the sensitive public.

The general consensus of the technical experts who put together this statement is that oil shale development will have a profound adverse impact on the environment of the states involved. The Department of the Interior suggests that this impact, however, can be accepted in view of the need for an industrial potential of one million barrels of oil a day, which could be produced by 1985. What the authors fail to point out is that as long as satisfying energy demands is a top priority of our government, no environmental cost

can ever be too great! This attitude is not consistent with the NEPA (Sec. 101.b.3) which states:

"...it is the continuing responsibility of the Federal Government to use all practicable means, consistent with other essential considerations of national policy, to improve and coordinate Federal plans, functions, programs and resources to the end that the Nation may--...attain the widest range of beneficial uses of the environment without degradation, risk to health or safety, or other undesirable and unintended consequences."

In the case of the Colorado lands, evidently because the Piceance Basin is not as scenic as the high mountain regions of Colorado and because our population's hunger for electrical power is so great, this project will not result in enough "degradation" to require a more ecologically sound program of development.

ECO contends that as long as our government considers only selected human values and selected human desires, there is no stopping the escalating exploitation of our public lands. Only when we can achieve a less anthropocentric and profit-oriented view of the earth, will we realize that the Piceance Basin is not a wasteland that can accept any insult, but a delicate natural system whose natural treasures are not presently fully appreciated by man. Perhaps the Piceance Basin will never be of great use to man. Perhaps this is as it should be

I spoke before about how ECO feels this is a crash leasing program. ECO believes that all the problems should be recognized and resolved before we lease our public lands. As Dr. Barry

Commoner says in his book Science and Survival: "Like the Sorcerer's apprentice, we are acting on dangerously incomplete knowledge. We are, in effect, conducting a huge experiment on ourselves."

In Volume II, page 65, of this draft environmental statement on oil shale, the same point of view is expressed. The report states: "By their nature, crash development programs frequently sacrifice environmental considerations and regional planning to technologic expediency. The balanced progress needed to resolve the complex interrelationship between the environment and technology is denied and orderly development is not possible."

This is the fear that ECO wishes to express. Evidently, we differ with the government on what constitutes a "crash" program.

To illustrate one reason why we feel this is a crash program, I refer you to pages 74 and 75 of Volume I, Section I. Here, the report emphasizes that additional research is required and that the details of these studies have been developed, but that they will not be complete for two years. Why should we be asked to lease our public lands when the environmental data that should be accompanying the decision making process is still not in hand? We should not let oil shale development proceed to the point where environmental damage can be conclusively demonstrated; instead, we should carefully plan out a sensible and ecologically sound plan of action. The burden of proof should be on the developer, that his actions will not

cause any unnecessary harmful alterations. But, here we face the problem of what is "harmful." Dr. Lawrence Hamilton, an ecologist at Cornell University, describes this problem of definition as "the nub of the public interest," and states, "it is essentially a value judgment, and should not be left to any user of resources whose planning revolves around profits..." Hamilton goes on to suggest that harm should be judged in terms of "quality of life." But, how do we measure quality of life? Should we measure it in kilowatt hours per capita, or in clean air and open space?

Presently, the demand for energy is growing at an exponential rate. Energy supply is not keeping up with this demand. Our government believes that this gap is widening and will continue to widen unless new sources of energy like shale oil are developed. ECO believes that the wrong energy policy is being pursued by the government. Energy suppliers cannot and should not attempt to meet projected demands at the expense of our national environment. Rather than attacking the earth to reap still more fossil fuels, we should attack the roots of the problem--the social trends and institutions that misuse our present energy production. We must realize that our earth's resources are finite and that we cannot meet an insatiable demand.

As Dr. Alfred Etter, a naturalist at the Morton Arboretum has written, "We each demand too much. It is our demands that destroy us, that keep the trucks roaring and the jets rocketing, and the giantism proliferating."

This should be the role of our government: to lead the way

in cutting down on needless waste and demand. Page 71, Volume II, of this statement spells out the alternative: "To reduce energy demand by the equivalent of the projected 1985 shale-oil production would entail reduction of energy consumption from petroleum by an estimated 4.2 percent." Although well-stated, this alternative is pursued no further.

It should be the national energy policy of the United States government not to encourage further exploitation and careless use of resources, but, to protect our resources by devising alternatives which provide an ecologically sound future. I would be extremely surprised if a determined federal effort could not cut down on petroleum consumption by 4.2 percent before 1985.

Energy demand is growing, but so is the demand for environmental quality. Power generation insures comfort and convenience, environmental quality insures mental health and physical survival.

I raise these larger questions of man's survival and attitude toward the earth because I feel that these questions are, as a rule, ignored. True, this is only one government leasing program of six tracts, but the incremental effect of one dam here, one strip mine there, and one leasing program there must be analyzed. I see no better time to raise these questions than right now. Man cannot afford to lay waste any more of his life support system. The growing list of rare and endangered or extinct plants and animals and the growing scarcity of natural resources should be an indication to man that he, too, may soon join the list of endangered species. Man is not immune. In The

Limits of Growth, the Club of Rome has spelled out the dangers for man. We must heed their warning, for the benefit of man and all other inhabitants of this planet. We have only one earth.

MR. DAY: Myron Corrin?

STATEMENT OF JEFFREY M. TODD

I'm not Dr. Corrin. Dr. Corrin had an appointment and will not be able to be here until this afternoon and I will take his slot and he will switch with me.

Why has an impact statement been drafted and leasing scheduled before thorough investigative research has been completed?

The Colorado Wildlife Division employs the most competent wildlife professionals in the State, yet they have had little opportunity to reveal their research results on oil shale-wildlife impact. In a development project that will seriously affect 10-20 percent of Colorado's mule deer population and will seriously alter migration routes of the world's largest migratory deer herd, I question why the Division has gone unheard or unheeded.

It is one thing to merely state, as the oil shale impact statement has, that there will be effects on wildlife, and it is an entirely different thing to delineate the exact impact of those effects. The impact statement fails to bring out those effects because there has been no time to complete and evaluate necessary wildlife research on the proposed lease sites. A wildlife inventory of the areas, the most basic of wildlife research, has not even been completed. What will be the specific effects of migrational route disruption on mule deer? Will

the animals adapt to alternate routes? Who chooses alternate routes - the deer themselves or presumptuous man? How will federally protected raptorial bird populations be affected? How will increased air pollutants in relation to the predicted night temperature inversions affect wildlife populations? The point here is that the true impact of oil shale development on wildlife or any other resource cannot fully be evaluated from vague generalities!

No specifics have been set forth in the impact statement relating hunting-recreation to the overall aesthetic and monetary economy of the Piceance region. What is a deer or an elk or an eagle worth to the people who have never seen one but would on some future occasion visit the Piceance Basis to do so? After all, this also is their public land. Once again, merely stating that a loss will occur is not enough. How great a loss will occur? Exactly how many man-recreation-hunting days will be lost as a result of oil shale development?

Escrow bonds of $500.00 per acre are mentioned in the impact statement. Is an acre which will be irreversibly destroyed because of high grade oil shale lying underneath to be given the same monetary value as an acre which can be restored? Does this $500.00 figure reflect the going cost of total restoration per acre? Does this figure reflect the cost of the loss of wildlife per acre? Does this figure reflect the restoration cost per acre 20 years hence or even ten years hence? Does this figure reflect the dollar loss per acre lost from local economies? What <u>does</u> this figure reflect???

In summation, why has this impact statement been drafted before research results have been evaluated? Why is this impact statement vague and ill-defined? Why hasn't proper time been alloted to answer the multitude of specific questions concerning the impact of oil shale development on wildlife and all related natural resources on our public lands? How can the impact of oil shale development on a dynamic living environment be evaluated by a static impact statement? Are we to launch into a project of this magnitude with this much potential environmental destruction without first knowing the exact results of its outcome?? These questions must be answered knowledgeably before this Environmental Impact Statement adequately fulfills its title. In my opinion, this has yet to be accomplished.

ALLEN STOKES

MR. STOKES: Mr. Hearing Examiner, ladies and gentlemen. My name is Allen Stokes, giving this statement for Kay Collins, President, the Denver Audubon Society. She can't be here today because she is not able to get away from work.

"Why not let the oil companies mine their own land rather than the public land? In its Environmental Impact Statement the Department of the Interior poses the alternative to the prototype leasing program of no development of public oil shale lands. However, Interior does not discuss this alternative in a meaningful manner. It admits that at least three tracts in private ownership are large enough to support commercial operations, but says that the Department cannot assess their commercial potential nor willingness of the oil

companies to develop them. Why cannot Interior assess these possibilities? The National Environmental Policy Act of 1969 requires Interior to assess this alternative. Why can't Interior assess the commercial potential of the private lands when other persons have made such an evaluation?

Private holdings contain high quality deposits that can support commercial size operations. The National Petroleum Council has recently estimated that 17 billion barrels of oil could be recovered from high quality, privately held deposits. (Oil shale averaging 30 gallons per ton at least 30 feet thick is considered high quality.) At least six billion barrels considered as "prime reserves" (35 gallon per ton shale at least 30 feet thick) that can be recovered through underground mining would support a maximum production of 800,000 barrels per day for 20 years.

It is apparent that in terms of resource adequacy alone, development could begin on privately held deposits. As Charles H. Prien, head of the Chemical Division at the Denver Research Institute, has noted: 'There is sufficient shale under private ownership for initiation of a shale industry by private capital.'

If the oil companies mined on their own land, the 50,000 acres needed for mining on the six tracts would be spared destruction. The recreational uses, the solitude, and the aesthetics would remain unspoiled. If oil shale proves commercially productive on private land, then further mining on public land could be considered. Although solutions to environmental problems should be learned before mining

begins, a period of mining on public land would give time to learn how to avoid harm to the environment. The companies could possibly learn how to prevent pollution of underground water or whether they must pump in water from the Colorado River, and whether they can dispose of waste oil shale rock by means other than by filling the nearby mountain canyons and whether native shrubs and grasses can be grown over areas where waste oil shale is dumped. These are critical areas of environmental concern where there are many unanswered questions. Perhaps solutions could be found while mining on private land. If answers are discovered, and future mining is to occur on public land, much damage to the public land could be avoided. The public land need not be the guinea pig.

My second question involves government income from the oil shale leasing program. Government income from the leasing of the oil shale lands will be minimal compared to the potential income of the oil companies. Government, the landlord of the public lands, will receive money from bids for the lease tracts, rent, and royalty payments. Initial income will be from the bids. Income from this source is speculative because it is not known how severely the companies will compete against each other for the leases. The government should have some minimum bid requirements. The second source for income is the rentals. They are set by the Mineral Leasing Act of 1920 at 50 cents per acre. This seems extremely low compared to the cost of renting or buying private land. In the 1960's when oil companies were buying oil shale land, prices were about $2,000 an acre. At this price a lease

tract would sell for $10,240,000. Rentals from a lease tract will be only about $51,000 over the 20 year period of the lease. After 20 years the value of the land to the government may be minimal because it has been partially destroyed by oil shale mining. In effect, the government will have sold land worth over $10,000,000 for $50,000. The government must reassess the rentals established fifty years ago in light of the current escalated values of land. A third source of revenue from oil shale is the royalty payments. The Department of the Interior has proposed royalties of 12 cents per ton of oil shale which works out to 17 cents per barrel of oil produced from 30 gallon per ton oil shale. This is about a 1/20 royalty rate based on a selling price of shale oil of $3.20 a barrel. This compares to a 1/8 royalty rate for oil leases. Why has Interior proposed these low rates?

Under the Mineral Leasing Act of 1920 royalty payments go 10 percent to the United States Treasury, 52 1/2 percent to the Bureau of Reclamation and 37 1/2 percent to the state of the lease tract. More of the royalty pie should go to the Interior Department to help pay the cost of restoring the lease tract when mining is completed. Even though the lease provisions require the oil companies to revegetate the land, the companies could refuse with the penalty only $500 per acre of land disturbed. The companies may well forego this bond because the cost of revegetation would be greater. Interior, unless it had money to rehabilitate the lands, would also probably fail to do so because of the high cost." Thank you very much.

RICHARD SPEED

MR. SPEED: Members of the Board, ladies and gentlemen. My name is Rick Speed and I work for the Environmental Action of Colorado. Our group has had considerable interest and has done considerable research into the energy situation in this country. Today, I would like to thank you for allowing me to spend a few minutes with you and share some of the results we have had.

First of all, I am not a lawyer or a politician and so I am really not qualified to speak on the legal or political aspects of the question but I would like to compliment Mr. Stokes on his presentation and state that I also cannot understand why the oil companies can't go ahead and prove their technology is feasible on their own land before they ask the Government to lease public treasures at a cost which to say the least is nominal.

Secondly, as an environmentally concerned citizen, I would like to comment on some of the areas of envrionmental impact of a large scale oil shale development. The first area I would like to comment on, is water. As I am sure you are all aware, this is a semi-arid region. We are very short of water, yet the proposed development would use massive amounts of this scarce supply of water. When that is considered in conjunction with the North Central Power study which would also use massive amounts of scarce water supply, you can see this whole area is going to be very short on water and if all of the development, if a full scale development of local oil shale and the North Central Power study will not be possible. And, even if it was, all of thes rest, every major river would be dammed, destroying

fantastic farming lands and wilderness areas. There are other problems in the area of water. They include the high salinity of the Colorado River which is present. Development of oil shale would make immeasurably worse through the leaching of solids and disturbing the channelization of rivers, and bringing water into develop the oil shale. There is also the problem of decrease water flow to the lower Basin States which is very critically low. We can hardly meet our treaty obligations to Mexico in this area and the salinity requirements are very questionable right now. There is a problem as to the disposal of the water that is used in the processing of the shale. The second area I would like to comment on is the air. Most of the air in this area is clean now. It is beautiful and I don't feel that we should allow any degradation in this area. It is some of the last clean air in the country and any degradation is unacceptable and I don't think you can carry out this type of development without serious degradation of the air.

The third area I would like to comment on and next in importance to water is the land. We still don't know how the shale is going to be obtained, whether it's going to be room and pillar, strip-mined or in situ. If it was strip-mining, of course, we would be trading beautiful mesa country for basically a parking lot. And, even if it is mined with room and pillar operation, because it expands we would still be left with tons and tons of spent shale every day, filling in the beautiful canyons. There are several questions regarding land that I am concerned about. One is whether anybody can assure

us that there will not be serious erosion problems with this compacted spent shale. It has been demonstrated now that if you put about 300 pounds of fertilizer an acre on it and water it every day or twice a week or whatever it is, you can revegetate the spent shale. What happens to it when you stop taking care of it like a greenhouse? The material is fine granuals, grainy like grit, and it just seems to me that it would be very easy for the wind and water to erode this and increase water pollution in the Colorado River. I can just visualize how this would create huge gulleys and result in huge dust bowls 30 or 40 years from now after the oil companies have moved out, after they've processed all the shale they've wanted and they are no longer watering the land and taking care of it. So, I would ask who is going to take care of this land if indeed, it is not stable over a long period of time which I suspect it's not.

The fourth area I would like to comment on is recreation. These lands right now are beautiful recreational lands with hardly any population on them. It is the home of the largest deer herd in the country. I believe this is a much higher use of the land, and I don't believe we should develop it for oil shale and I make that recommendation because I see that all the developmental and all the economic aspects of this question predicated upon a growing demand for more oil and I don't think that this is going to happen. There has been a lot of talk of an energy crisis which is defined as supply being unable to keep up with the demand. We right now waste more energy than we use efficiently. When you look at the energy situation from

an overview and from an environmental overview, there are many more attractive alternatives than developing oil shale to meet our energy needs. One of the most attractive, I feel, is using the energy we have much more efficiently. If we could go to an electric transportation system, which is technically feasible today, it would double the efficiency of our transportation system, that it would cut our energy need in half, right there, for all transportation. It is much easier and much more efficient to recycle material that it is to mine, refine, and transport them. We could save massive amounts of energy there just by the institution of recycling to obtain our materials from waste. This also does much less environmental damage, we don't have to mine. Also, better building design, use of more insulation in our buildings, could considerably cut down on the 25 percent of the energy we use for space heating units.

Also, if we were to use the wasted heat from the power plants in the industrial process heat and space heat, we could reduce substantially the amount of energy we use for these sources.

A study out of the Oakridge National Laboratories indicated that our total energy needs could be 62 percent of what they are with this one application alone -- this one improvement alone. Finally, the use of solar heating and solar heating and solar energy for space heating and cooling and for central station power generation would eliminate the last large-scale need for any fossil fuel. So, I feel that the implication of these technically feasible alternatives should alleviate the need for any further degredation...alleviate the need for any

further degradation of our air, our land, and our water in the use of fossil fuel to provide energy.

I would strongly urge you to consider these alternative to the development of oil shale which would of necessity do mass environmental damage to our air, land, and water and not supply any significant portion of our energy needs and consider the alternatives much, much, much more strongly. All I ask you is to develop political decisions and I urge you gentlemen in the government to lobby and look at the alternatives. Don't leave our state or waste land. Thank you.

STATEMENT OF CLIFF CHAMBERS

MR. CHAMBERS: Gentlemen, my name is Cliff Chambers from the GSU School of Forestry and Natural Resources in Ft. Collins, Colorado.

The Oil Shale Prototype Draft Environmental Impact Statement's social considerations are, to be blunt, inadequate, inefficient and irresponsible. The social needs of the citizens on the Western Slope are definitely not adequately considered.

I feel that when one is considering social impact on the tri-county area of Colorado involved with the oil shale prototype program, there are many aspects of social impact that are not adequately mentioned in the Statement. The following considerations, I feel, will have a major impact on the surrounding environment and must be thoroughly studied and included in the final C (102) Statement.

The first consideration is the influx of people into the oil shale region of Colorado. The impact statement says towns of Rangely, Colorado, will increase in population from 1,500 to 9,350.

Meeker, Colorado's population will increase from 1,500 to 7,650, Grand Junction's population will increase from 20,170 to 30,000. In general, the population influx caused by the construction workers, operation personnel and support services required by sits C-a and C-b will be 40 percent increases in the number of people that will migrate to the Western Slope, but this is where specifics stop.

What about housing for the construction workers, operational employees and support personnel? Questions not answered in the social section of the Impact Statement titled "Impact on Existing Economics and Social Environment" are:

1) How many acres of land will be required for mobile home parks and construction of permanent homes, and where will these be built?
2) Does the oil shale Regional Planning Commission mentioned in Sec. 4, Page 56, Vol. 3, have zoning plans that will adequately protect the environment?
3) How will zoning and planning control new urban development in a rural area so mentioned in Vol. 3, Sec. 4, Page 57, paragraph 2?

The second major area not adequately covered in this report are the additional service facilities that will be required: schools, hospitals, libraries, additional police force, department stores, etc., all these services will be required for an additional 40 percent population. These consideration are brushed off in the C (102) report

on oil shale, but people need these service to sustain a good quality of life in the area of the Western Slope.

The third major area poorly considered is the mobile population that an oil shale industry will encounter. Construction workers will come and go as the prototype project is started and completed. Will the services such as schools, highways, and hospitals be abandoned as these people leave the area or will the prototype plant operators fill in the gap? Again, this is unanswered.

The fourth major social consideration left out is the water needs for the 40 percent increase in population. The oil shale industry will require great amounts of water as indicated in the 102 Statement, but about the people in cities like Rangely, Colorado? Don't they need water too? Will the existing water supplies in the cities be adequate or will more water be needed? If more water is needed, where will it come from? How will the water be transported and will it be pure? Again, questions unanswered that must be responded to.

The fifth major consideration left out is that of public transport. Roads will have to be built to and from the prototype plant. Roads will have to be built to sustain the additional population that will migrate to the Western Slope. How many roads, where will these roads be built? I hate to be repititious, but this Environmental Statement forces me to, again these questions are unanswered.

If time permitted, I would go into the questions I raised in much more detail. But, I feel the basic questions I have raised

are sufficient for a brief oral presentation. What must be stressed is that questions such as water requirements for oil shale committees should not be brushed over lightly, but answered fully. Specifics on how many, where and why must be answered fully and fully covered on each question of social concern that I have raised this afternoon.

In closing, I hope statements as those in Vol. 3, Sec. 4, Page 5, of the Impact Statement (read) will be taken out of the draft and completely revised in the final edition of the report. The social impact section is full of these generalities and must be re-written.

If the amount of space devoted by the Draft Statement to the social impact of a prototype oil shale program is any indication of the concern for the citizens of the oil shale region, I feel very sorry for the people now living in cities such as Meeker, Colorado. These people deserve more. Thank you.

EDWIN J. MERRICK

MR. MERRICK: Gentlemen, my name is Edwin J. Merrick and I am a graduate engineer, hold a Masters' Degree in Mechanical Engineering. I have served many years as an executive in advanced systems engineering in the aerospace and defense industry. I am now serving the National Wildlife Federation as the Southwestern Regional Executive.

I am a technologist; I am an ecologist. More importantly I must try to be a judge. I have read; I have considered the draft environmental statement; I must observe that on the information that presently exists oil shale technology should remain confined to the laboratory. This infant fuel-Frankenstein beating on the

laboratory door to be released cannot yet be freed to sterilize the land, to pollute the air, to embalm the wilderness, to suck the rivers dry.

Volume II of the Draft Environmental Statement Pleads

"The Government could delay the initiation of an oil shale program on public lands, and reassess the situation from time to time to determine whether such a program should be started. This would avoid, on a short-term basis any effect on the environment but in the long run the effect could prove more harmful. Potential environmental impact would probably be the same at a later date, but many of the things which must be learned to protect the environment cannot be learned except by actual experience."

I am not sure those statements are either true or wise. We are all familiar with learning by actual experience; with misguided technology, with misapplied resources - how many need to be reminded of Thalidomide, the modern drug that deformed the bodies of the unborn while we learned by actual experience. How long since Silent Spring did it take to recognize the pervasive, persistent, pernicious clutch of D.D.T.? Daily, hourly, we all hear the relentless crunch between man and technology in this automotive, automated, and nuclear age.

Here in the oil shale development problem we have an opportunity, not ecologists alone, not citizens alone, not energy producers alone, not governmental overseers alone, but all of us together have an opportunity to delay for a while the silent spring.

To hold off the silent spring, to soften the crunch until such time as dedicated laboratory research and careful systems analysis demonstrate clearly and incontrovertibly that all aspects of the oil shale systems problem are resolved.

There is a time when technology is too primitive, the by-products too damaging, the side effects too gross, the relationships too uncertain to proceed. It is as though we launched the Apollo spacecraft toward the moon and then told Astronauts Armstrong, Aldrin, and Cernan "Look, fellas, don't worry! We can get you there, we can land you safety. And, in the meantime we'll be working on the problem of getting you back."

Sure, we need the oil. But, what are we going to do with the tons of waste? Where is the market for this product of progress? Can we stuff it in frankfurters? Pave more wilderness? Fill up the Grand Canyon? How bad is the waste problem? What does the industry suggest it is going to do?

Volume I states that:

"Commercial shale oil production, under the most optimistic estimate, could begin about 1975 at a rate of about 18 million barrels per year (50,000 barrels per day), on the basis of anticipated technological progress."

It goes on to state:

"In the period 1981 to 1985 capacity is assumed to grow to one million barrels per day."

If we take the data given in Table 1-5, Quantities of in

Place and Spent Shales, and calculate the excess spent shale, that is the amount of increase in the volume of shale after the oil is removed or what my son called the 'popcorn effect,' we get the following data.

TABLE I

Quantities of in Place and Spent Shale

Upgraded Shale Oil	Shale mined tons per yr. average	Shale volumes in billions of cubic ft. per year		
Barrels per Day	Barrels per Yr.	In place average	Spent Loose	Excess Loose
50,000	18 million	28.4 million billion	.43 billion	.65 billion	.22 billion
1,000,000	360 million	568 million	8.5 "	13"	4.5 "

The Draft Statement notes:

"The volume of the spent material even after compacting, is at least 12 percent greater than its in-place volume. This is due to void spaces in the mass of crushed and retorted material which are not present in the shale prior to mining."

At a 50,000 barrel per day rate .22 or about one quarter of a billion cubic feet of excess spent shale (the popcorn) is being created each year and at a one million barrel per day rate, 4.5 billion cubic feet of excess spent shale are being created each year. These are very large numbers and difficult to comprehend. In more plebeian terms at a shale oil production rate of 1,000,000 barrels per day, if we piled the resulting excess spent shale in the streets of Denver,

the streets would be eleven feet deep in this residue and would be repeated each year. If we piled not just the excess, but all of the spent shale in the streets, Denver would be inundated with a 33 foot deep cover every year.

That's a lot of waste material to plan for and an examination of what is said about disposal in the Draft Environmental Statement is in order.

On Page I-56 of Volume I we find

"If the material is to be returned to a worked out area of the mine, a slurry system would probably be used. Although this has not been attempted for spent shale, experience with the other materials and limited tests with shale indicate the slurry should contain 50 percent solids."

On Page I-40 is the statement

"It is assumed that most spent shale will be initially disposed of in box canyons."

On Page I-50 it notes

"...We anticipate that in any commercial operation the permanent processed shale surface will be planted in grass as a temporary cover to control erosion."

In Volume III we read

"An alternative mode of operation might be to return the spent shale to the pit after 16 years or until the pit opening was large enough to permit return as backfill."

In Volume III we note the obsservation

"The visual impact from the disposal of spent shale and overburden storage would be notable until restoration activities are completed...spent shale disposal in the Douglas Creek drainage would alter the view of cathedral bluffs from the Douglas Creek drainage from the top of the bluffs."

You bet it would alter the view. Incredibly and callously no mention is made of the plant and wildlife underneath that spent shale or the free flowing clear waters below.

Volume III notes

"Any damage to this water source as a result of oil shale development, either to the ground water supply or contamination of the surface water, would result in serious effects on livestock and wildlife use."

I suspect it would be quite serious -- should we instruct the trout and the elk and deer to hold their breath for 16 years while we solve the problem?

That's just the spent shale problem. With respect to in situ processing in Volume III we note

"However it should be noted that in situ processing is in the experimental phase of development and there is no assurance that commercial technology can be developed."

No assurance! But, we're ready to tear up the wilderness. To view in a detached way these contradictory statements on how to handle spent shale, on watershed destruction, on in situ processing, I would like to quote from the hearings in the House of Representatives

of the Ninety-first Congress on the environmental decade. During these hearings an article by the famous British scientist, Lord Ritchie-Calder was quoted in entirety. I read from the article the following paragraph:

"A hundred years ago, Claude Bernard, the famous French physiologist, enjoined his colleagues, 'true science teaches us to doubt and in ignornace to refrain.' What he meant was that the scientist must proceed from one tested foothold to the next (like going into a minefield with a mine detector.) Today we are using the biosphere, the living space, as an experiemtal laboratory. When the mad scientist of fiction blows himself and his laboratory sky-high, that is all right; but when scientists and decision makers act out of ignorance and pretend that it is knowledge, they are putting the whole world in hazard. Anyway at best science is not wisdom; it is knowledge, while wisdom is knowledge tempered with judgment. Because of over specialization most scientists are disabled from exercising judgments beyond their own sphere."

Thus wrote Lord Ritchie-Calder.

On Page I-74 we find recognition of this principle, it reads:

"Although significant progress has been made in delineating and devising environmental control measures, additional research is required. Such work is being conducted by independent groups within the public and private sectors. In addition, some 50 representatives of local, state, federal, and industry organizations have been asked by

the state of Colorado to outline a broad course of additional studies for:

(1) Revegetation and surface rehabilitation

(2) Environmental inventory and impact

(3) Water resource management

(4) Regional development and land use planning

The details of these studies have been developed and agreement has been reached on joint participation in this three-quarters of a million dollar, 2 year effort. The results of this cooperative effort will be to complement and demonstrate many of the concepts presented in this evaluation. The data from these studies would be avaiable prior to development of either public or private land."

I believe it is essential that the data be made available before any development of public or private lands.

The planned destruction of wildlife habitat, the conversion of our beautiful streams into industrial sewers must be prevented at all costs. The important point is that conscientious and competent laboratory research can solve these problems. Extensive laboratory work is needed in the total oil shale systems problem starting with in situ recovery and including rational approaches to conversion and recycling of the attendant waste.

The stipulations for the proposed oil shale prototype program, if and when any leases are issued, must include the requirement at every leased site for the establishment of an overseers committee

composed ofrepresentative of industry, government, education, conservation, wildlife, and concerned citizens. The problems are too complex for the technologists of the oil industry alone.

On Page II-9 of Volume I we note that in the Green River formation of the three state region:

"The known parts of the oil shale deposits of the region contain at least 1,800 billion barrels oil equivalent. Some 80 percent of the known higher grade reserves are located in Colorado, 15 percent in Utah, and 5 percent in Wyoming."

Those reserves at a daily production rate of one million barrels would last some 5,000 years. Can you visualize the pile of paleolithic popcorn that would result?

Isn't it comforting to contemplate a series of modern pompeiis inundated not by the fury of an exploding volcano but by the mindless, thoughtless refuse of progress fired by self-seeking, self-serving savages.

Gentlemen, I recommend we put this gross genie back in the bottle. We need time, we have time. We need intelligence, we have intelligence. We need resources, we have resources. Let us use them together to solve the total problem. We need the oil. We need the energy. Even greater will be the need for the beauty, the solitude, the sanctity of the wilderness in time to come. Technology can recycle glass bottles, paper cartons, beer cans, junk automobiles. Technology cannot recycle the Rockies.

Thank you very much.

BEN WEICHMAN

MR. WEICHMAN: Thank you for the opportunity to appear. It is not possible to define meaningfully in the ten minutes allotted, the need for the development of oil shale. Therefore, we shall submit in written form and in detail to the Department of the Interior shortly hereafter.

My name is Ben Weichman. Tim Robberson is the attorney. You can always tell the difference. I work for the Superior Oil Company and would like to say that the U. S. Department of the Interior should be commended for their very rational approach to the potential environmental problems associated with oil shale development. The Draft Environmental Impact Statement cites essentially all of the presently available information it has of any value, in defining the extent of the potential environmental problems. The Department of the Interior didn't attempt to offer a complete solution but it does review the data from a solution potential. The Department of the Interior's oil shale program is so tailored as to wisely throw the solution of these problems into the laps of private industry where it belongs. The tough leasing terms pertaining to the development require of the developer to find acceptable solutions to all environmental problems before continued developing is possible. The pursuit of oil shale development by private enterprise can and will define the technology of oil shale development without degradation to the environment beyond what is acceptable and beyond responsible limits. The technology for the responsible development of oil shale has essentially

been defined and most of that technology is listed in the draft statement. The draft statement...most of the data in the draft statement...most of the data is focused on the worst set of conditions that could prevail in an economic commercial oil shale plant. I would like to briefly define the probably development conditions under which most of the environmental problems could be entirely avoided. That involves development of oil shale which contains the associated minerals of Nahcolite and Dawsonite. Time here doesn't allow detailed treatment of all the processes or technology nor is there time to adequately reply to all of the objections to oil shale development. However, I would like to briefly discuss a few of the most publicized objections.

A frequent objection deals with the very need for the oil shale development. In answer to this I would refer to the draft statement which shows substantial reserves of rich oil shale in the Piceance Creek Basin which contains greater than 20 percent Nahcolite. The draft statement also identifies Nahcolite as an absorber of SO_2. An oil shale industry producing 1,000,000 barrels of oil shale per day from Nahcolite oil bearing shale, would also produce 300 tons per day of Nahcolite; and 300 tons per day of Nahcolite can potentially free for use 2,000,000 tons of three percent sulphur coal per day by cleaning up the static gas to meet all specifications.

The combination of 1,000,000 barrels of shale oil per day and 300,000 tons of Nahcolite per day could, therefore, potentially make available for use over twenty quadrillion BTU's of clean energy

per year. This is 54 percent of the projected 1985 energy deficit in the United States.

Another highly publicized objection to the development of oil shale is the necessity for the surface disposal of vast amounts of shale residue envisioned to cover areas--very large areas--of the present surface. There is in the Piceance Creek Basin over 1,050,000 acres of oil shale containing 20 percent Nahcolite and also more than 10 percent Dawsonite. The draft statement reviews the steps of the extraction of both Nahcolite and Dawsonite from the oil shale in processing. An oil shale operation...mining oil shale from an underground mine in which the oil shale contains greater than 20 percent Nahcolite and 10 percent Dawsonite will allow all of the spent shale to be returned back underground to the mine. Return of all of the leached spent shale into the mine is possible because of the removal during the processing of material of nearly 50 percent of the original volume of the material as well as an amount due to processing will increase the remaining volume from about 50 percent to about 90 percent of the original rock. Replacement of the leached spent shale back underground eliminates any ecological problems encountered by surface disposal, and it is also expected to lend support to mine structure thereby eliminating surface subsidence.

A third frequently publicized objection to oil shale development is water degradation of the Colorado River system. Data is present in the draft statement which is not discussed in detail but is the basis for pointing out that it is possible to process oil shale

in large quantities without degradation of the Colorado River systems, and even more importantly can potentially upgrade the quality of the Colorado River water. A plant processing oil shale, Nahcolite, and Dawsonite is a potential source of pure water. This can be shown by review of the processes. A 1,000,000 barrel of oil per day oil shale plant producing Nahcolite and Dawsonite would use 480,000 acre feet of water per year without exacting any surface water from the Colorado River system. The saline water from the leached zone can supply all of these requirements. Of 480,000 acre feet of water a year, 88,000 acre feet per year is consumed for dust control and spent shale wetting prior to disposal; 355,000 acre feet per year is used for the leaching process in the production of aluminum compounds and sodium carbonate. However, most all of this water can be recovered in barometric condensers as pure water for subsequent use. Thirty-eight thousand acre feet per year is required for hydrogen production, if hydrogenation of the shale oil is necessary; and also for the type facilities associated with a 1,000,000 barrel of oil per day plant. This water can be supplied from the pure water production from the process, leaving a surplus of 317,000 acre feet per year of pure water.

If the total water requirement of 480,000 acre feet of water per year is taken entirely from the leached zone, it is estimated that there is at least a five-year supply of saline water in the leached zone in the Piceance Creek Basin, not considering any recharge. The pure water produced from the process is equivalent to about three

quarters of the average flow of the White River as measured at Meeker, Colorado.

A fourth publicized objection to oil shale development is why doesn't the industry prove the economic production of oil shale on presently held private lands. The answer is it is just simply not economic. However, I would like to point out in addition that all of the land or almost all of the land which contains the minerals Nahcolite and Dawsonite are held by the Federal Government. There's very little private acreage involved in the oil shale lands containing the minerals Nahcolite and Dawsonite.

Other publicized points of opposition to oil shale have been effectively answered, however, at this time. Time here does not permit further detail at this time. The beneficial impact of oil shale development on the energy and environment and the energy requirements of this country substantially overshadows any other apprehension that has not been discussed at this time.

Thank you very much.

MR. DAY: Thank you. I will call on Myron Corrin.

MYRON CORRIN

MR. CORRIN: My name is Myron L. Corrin, Professor of Atmospheric Science at Colorado State University. I am speaking here not as a representative of that group or any other group, but primarily as an individual who has been active in the area of atmospheric research for quite some time in both an academic and research capacity. I shall restrict my remarks here to the draft

statement as regards the possible adverse environmental impact of the contemplated oil shale development upon air quality.

I would begin by stating that the treatment of this subject in the draft statement is in my opinion both cursory and quite inadequate. The findings are summarized quite properly on page IV-32 of Volume III in the following words: "the impact on the air quality has yet to be established." The severity of air pollution is normally defined by the increased concentration of various pollutants, gas, and particulates. There are standards governing permissible concentrations which are given in the terms of time which those concentrations persist. These standards have been set by both the Environmental Protection Agency and by the various states.

Actually, what goes into such a concentration is three factors: one, the rate at which the material is put into the air; secondly, by the mixing of the air; and thirdly, by the rate of removal of materials from the air. It is possible in the present state of the art, given an emission rate and given the proper meteorological parameters to compute a model which will give the ambient air concentration as a function of space and time. I have failed to find any such considerations given in the proposed statement. In fact, I have seen not even an attempt to obtain the data necessary to apply the rather well known model.

There are a few general statements given regarding gross wind and climatology conditions under a very complex valley terrain regime. The present state of knowledge regarding the climatology

of the sites is in my opinion insufficient for a true estimate of the effect of the oil shale development upon air environmental quality.

There is known in a fairly qualitative sense how the possibility of inversion--an atmospheric condition which traps pollutants in a rather thin, stagnant layer--it is stated that such inversions are often encountered. There are statements about mixing depths in June and January, but in no words could I find any references to statistics giving the probability of inversion or anything about the duration of inversion; and it is the duration of inversion conditions which lead to what is commonly called air pollution episodes in which for a period of days the pollutants are trapped in essentially a stagnant air mass and build up to a very high concentration. I have a strong suspicion that much of the climatological data was obtained from the nearest weather stations and that the required extensive study required for a proper statement has not been made. I emphasize especially the lack of micro-meteorological data. Data for very, very restricted areas which I consider necessary for the evaluation of pollution from an oil shale plan.

I am in complete agreement with the statement made that all emissions must be controlled to meet present State and Federal emission standards. I am not at all convinced, however, that the technology required to meet such standards is at hand. There is no sound evidence in the statement regarding this question. We simply have remarks about the general technology and methods of air pollution control but there are no studies indicating the application of any

such methods to the specific problem of oil shale refining and retorting. It is noted in the report that even if emission standards are met the quality of the air will be degraded.

Let me speak to one specific point. The present standards for both emission and ambient air concentration particulates relate only to the weight of such finely dispersed solids and liquids. We will shortly see, I am convinced, the introduction of other regulatory parameters directly related to the effects on human health. These include particle size distribution and chemical composition.

The so-called respiratory types ranging in size from about half to two microns is particularly dangerous to human health in that particles in this size range are retained in the lungs. Note that if we set the standards in emissions in terms of mass, we are effectively ignoring small particles. An increase of ten in the radius of a particle means an increase of a thousand in the weight of a particle. Our control techniques for particulate emissions are based upon mass. They work with big particles, and a 99 percent figure looks awfully impressive. Remember, with a 99 percent figure most of the small particles are still getting through, and it is these small particles which will have the major effect upon the health of humans and animals. I have seen no data in that statement regarding the particle size distribution, and I see no evidence regarding the chemical composition of the particulates.

I am especially concerned about the possible existence of carcinogen particulate matter of a particular chemical composition

which can cause cancer on both the skin and the lungs. And I further note the production of carcines is rather common in which one conducts a pyrolysis operation or a retort operation. I saw no consideration given to the possible cumulative effect on many plants operating in a smaller area. Under these conditions even though individual emission standards may be met, the overall effect is gross deterioration of air quality.

In conclusion, I am disappointed by the apparent lack of work in preparing these sections of the Environmental Impact Statement. With a program of this prospective magnitude, I would have expected fewer general and platitudinous statements and more specific studies and information. I strongly doubt the implications regarding air pollution control technology will be achieved. I would suggest the necessity for the study of specific sites.

Let me conclude with another quotation, "once sufficient background data is obtained it is then possible to assess the actual impact of those air contaminants expected from oil shale operations: particulates, oxides of nitrogen, and sulfur oxide." It is more than unfortunate that the Environmental Impact Statement does not present sufficient background data upon which a proper assessment can be made.

Thank you.

CHARLES WARNER 1/

MR. WARNER: 1/I am Charles Warner representing the Wilderness Workshop of the Colorado Open Space Council and will submit a written statement which is more detailed later today, I'd like to note here

1/ Transcript garbled - should be Charles Wanner

it is very hard for interested citizen groups to assemble detailed comments in response to the draft impact statement when there are so few copies available. Further, we question the wisdom of holding hearings such as this during working hours which thus restricts the average citizen severely because he can only rarely obtain the full day off as necessary to participate in a hearing such as this one.

For the moment, I will limit my comments on the impact statement to the subject of the wilderness which is obviously our most pressing concern as relates to the impact of the proposed pilot project upon the White River, the proposed dam there for oil shale. The south fork of the White River has been discussed all the way since 1966 in Forest Service hearings on areas surrounding the Flat Tops. This area has been considered wilderness area for many years. Conservation groups, both state and national, supported the inclusion of this area in the first set of wilderness areas in 1966. The area is noted--that's area G-1--in the most recent Forest Service study of the Flat Tops area.

That portion of the river which would be dammed and destroyed by the proposed oil shale development is in wilderness quality land and is itself of quality sufficient to qualify the river as a Wild Scenic River under the national Wild and Scenic Rivers Act.

The significance of this stretch of water as it stands is not only in the quality of the wilderness which is a limited resource and could be destroyed, but in the credibility of the impact statement when it pretends to consider alternatives. If after two sets of

hearings by the Forest Service in consultation with state government and industry an alternative to this dam site has not been seriously considered to permit this area to remain wild, then how are we to believe that any alternative has been seriously considered in other areas of greater magnitude and complexity.

Having read the report almost in its entirety, we do not feel it's adequate. It is hoped that the final statement will truly assess both alternatives and damage to the environment. Further, it should consider a total revamping of the provisions for the monitoring of environmental impact.

As stated before our specific comments will be made available later.

Thank you.

MR. DAY: Hester McNulty.

HESTER MCNULTY

MRS. McNULTY: First I would like to make it clear that this is the official statement of the League of Women Voters of Colorado.

I am Hester McNulty speaking for the League of Women Voters of Colorado which has been engaged for a number of years in the study and evaluation of many of the broad environmental issues that are inherent in the proposed oil shale leasing programs. We are particularly concerned with the implications of the proposal on air quality, water resource management, and land use planning in the State of Colorado.

The League of Women Voters believes that citizen participation

is essential in environmental decision making and would like to register our protest concerning the insufficient length of time given for analysis of the 1,150 page draft statement. In addition, we support the involvement of all levels of government--local, state, and federal--in the decision making process; and we ask why relevant state boards, such as the Colorado Air Pollution Commission, were neither sent a copy of the draft statement nor asked for comments on a proposal that directly effects all the citizens of Colorado?

Some of the major concerns of the Colorado League are embodied in the following questions:

In view of the fact that the draft environmental statement admits that the development of an oil shale industry would have a major enironmental impact on the regions to be developed, and since these proposed oil shale operations will produce only four percent of the estimated 1985 national energy needs, we question whether there is a valid environmental trade-off? Is the proposed oil shale leasing program consistent with overall environmental goals for the State of Colorado?

Should there be a full-scale oil shale leasing operation before either a state or national land use plan has been developed? Should there not also be a national energy policy before any such large-scale commitments of land are made?

We have noted in the draft impact statement that up to 340 tons of sulfur, 120 tons of nitrogen dioxide, and 40 tons of fugitive dust and particulates will be emitted daily under full

operating conditions. We wonder how these daily emissions will affect the overall air quality in our state?

Since the estimates for consumptive water use range as high as 156,000 acre feet annually, we question whether the cumulative effect of this impact on the water resources of both the State of Colorado and the entire Colorado River Basin have been adequately assessed? And, we ask who will be responsible for overseeing erosion and salinity control over the long-range and also who will be ultimately financially responsible?

Have the alternative sources of energy been sufficiently evaluated in the draft statement or have they been dismissed as unfeasible only because they are not yet in full-scale production? For instance, is the conversion of organic solid waste to low sulfur fuel oil any more experimental than the proposed oil shale development itself? As the draft statement observes, "If only half of the organic solid waste could be converted to oil, it could supply an amount equal to current volume of residual fuel oil now used for electrical generation." Since the disposal of solid waste has become a major problem in many areas of the country, might it not be more practicable to institute programs to develop energy from this source rather than from oil shale?

Before any irrevocable decisions are made, the League of Women Voters of Colorado urges that the total long-term social and environmental impact of oil shale development on the state be carefully weighed against the short-term benefits to be gained.

MR. DAY: Thank you. Next the Colorado Citizens for Clean Air.

EUGENE WEINER

MR. WEINER: This statement reflects the concern of Colorado Citizens for Clean Air and the Energy Workshop of the Colorado Open Space Council. Before we raise questions about details in the impact statement, we want to express our concern that the development of oil shale is being proposed at this time without any national energy policy having been formulated. Even the pilot study proposed here will cause a significant deterioration in environmental quality, and this must be weighed against the benefits from additional energy resources by assigning priorities to them in an overall national planning effort. Until such an overall plan is formulated, it is impossible to determine whether we really want the development of oil shale to proceed at this particular time. With this reservation, we would like to point out what we feel are inadequacies in the impact statement relevant to the air pollution problem.

I. Air Basin: The State Health Department has made some measurements of how particulate emissions affect the air quality of naturally defined air basins in the Piceance Creek area. We see no indication in the impact statement that there has been any analysis of the rate at which pollutants can be emitted into the specific air basins of the Piceance Creek area without causing unacceptable loss of air quality. Such an evaluation must include emission contributions from the industry, new communities, transportation, and any local power generation.

II. Operating Problems: Although the statement claims that particulates and dust generated in the processing of shale will be adequately controlled by using the best existing technology, it is common knowledge that industries with similar problems, such as the cement industry, cannot guarantee adequate controls at high volume operations, even with the best technology available. All the impact statement promises, in essence, is to do the best possible job with no guarantee that particulate and dust levels can actually be reduced to the .08 grain/cubic foot level promised in the statement.

This also applies to the control of stack emissions. Public Service Company has been unable to meet State emission standards even though they utilize the best possible technology. It must be recognized that the oil shale industry will face the same problems that the power industry has been unable to solve, simply because they are processing unprecedented amounts of material.

There is no evidence that the industry has considered the possibility that the particulates from these particular ores might contain unexpected quantities of toxic or radioactive metal traces. Heavy metals and radiation should be monitored until the existence or lack of such a problem is determined.

Tailing dust problems are to be controlled by wetting. It is stated that the tailings will assume a cement-like character in the wet condition which will keep it compacted. Past experience has shown that unless such tailings are carefully controlled with moisture, the brittle characteristic and low abrasive resistance of

the dried tailings make it easy for strong winds and mechanical abrasion, such as traffic, to generate considerable atmospheric dust loads. We believe that additional maintenance, such as revegetation, will be necessary in the long run. The statement makes no mention of how the tailings dust problem will be controlled in the event of a severe water shortage, nor what party will be responsible for the maintenance of tailings after the industrial activity has ceased.

III. Power Plants: Although the statement makes an effort to include the effects of the new communities and transportation associated with the industrial development, it does not address itself to the generation of the required 100 megawatts of power per pilot plant site. Where are these plants to be located? How will they affect the already rapidly deteriorating air quality in the Four Corners region or region or wherever else they might be located?

IV. Non-degradation Policy: The statement's conclusion that there will undoubtedly be air quality deterioration appears to be in direct conflict with the non-degradation regulation of the Colorado State Health Department. The atmospheric character of the region to be developed causes high surface winds to exist at certain times of the year and frequent temperature inversions at other times. Both conditions will undoubtedly lead to a degradation in air quality. The high winds by raising surface dust, and the temperature inversion by trapping all the particulates and emissions in the valley where they originate. The clean air and long distance visibility of this region are considered by many to be a valuable natural resource.

The impact statement does not consider the negative aspects of destroying this resource, a factor which has figured prominently in the public opposition to additional power plants in the Four Corners region. The State Health Department has already observed that in similar valleys, a single emitter operating below the allowed emission rates can soon cause ambient air quality standards to be exceeded because of poor air circulation. We feel that the oil shale industry should be subjected to stricter emission standards than comparable industries which are in less critical air basins.

MR. DAY: John Anderman.

RICHARD H. DALEY

MR. DALEY: Gentlemen, Mr. Anderman couldn't be here today and has allocated his time to me so that I might speak. My name is Richard H. Daley, and I am speaking as a private citizen.

Oil shale, if developed, will provide the country with a new source of energy. The first question must be how will this energy fit into the energy requirements of the country, and is the amount large enough to justify the environmental damage which will result?

TOSCO President Morton M. Winston in May of this year has made the role of shale oil in the energy situation clear: "It is in buying time before other energy sources are available that oil shale has a significant role to play." This same philosophy of "buying time" is the consistent implication of the considerations of alternative energy sources in the Draft Statement--these other sources will

not be available until 1980-1985 and oil shale is needed to fill this gap.

The "most optimistic estimate" (Part II, p. 56) for oil shale development indicates that shale oil cannot even begin to fill this gap. The following figures from Part II of the Draft Statement illustrate the point:

Year	Shale Oil Production (Millions bbl./yr.)	Estimated Consumption (Millions bbl./yr.)	% Est. Consumption Supplied by Shale Oil
1975	18	6,550	0.36
1985	365	8,600	4.2

Thus even using the most optimistic estimates for shale oil availability, in 1985 this source of energy will supply only about four percent of our nation's needs. It is imperative to understand that even in the Draft Statement, it is conceded that by 1980-1985 other sources of energy will be available. The following statements have been excerpted from Part II of the Draft Statement and show that many alternative sources will likely be available by the time shale oil can supply four percent of our needs:

(P. 164) "Nuclear power cannot be considered as an alternative to shale oil before 1980."

(P. 127) "The current development program rate is not expected to provide for production quantities of natural gas that would be meaningful in comparison to the energy supply impact of the proposed oil shale development to the year 1985."

(P. 158) "There are presently no coal-to-liquid conversion

plants in the United States; however, a few prototype commercial plants may be in operation in 1985."

(P. 123) "It appears unlikely, however, that development of the needed technology and of the required industry can be accomplished in time to permit significant production from tar sands before 1985."

(P. 189) "While MGD appears to offer considerable future potential for coal-fired power generation, the technologic and economic uncertainties are still so great that it cannot be considered as a viable alternative power source by 1980."

(P. 200) "It is doubtful if production of significant magnitude from biological energy could be achieved by 1985 so, pending future research and development, it cannot be considered a viable alternative at this time."

(P. 201) "Accordingly, it (liquid hydrogen) is not a viable alternative for consideration within the 1980 time frame."

Obviously, any justification for development must be, and has been, to supply energy before these other sources are commercially available. However, a supply of only four percent of our energy cannot begin to justify the environmental damage which will result from this development. Furthermore, virtually no attention is paid to the certainty of use of a combination of all of these sources of energy, or to the possibility of a rapid technological break-through for development of at least one new source, or to the possibility that the development of other energy forms will quicken if oil shale is not

developed.

Summarily, the environmental destruction which will result from the development of oil shale compared to its contributions to the nation's energy requirements before "cleaner" forms are available makes development nothing short of ludicrous.

MR. DAY: Thank you. Mr. Charles Parks.

JAMES L. PHELAN

MR. PHELAN: Gentlemen, my name is James L. Phelan and Mr. Parks has switched with me. I am addressing the Board as a private citizen.

Thank you for giving me an opportunity to address myself to one of the most important issues facing our state. I will discuss only a small part of the draft environmental impact statement, the consideration given to the socio-economic effects of oil shale development. After a close and careful study of the entire statement, I must conclude that the statement's treatment of the social and economic impact on the state of Colorado is woefully inadequate.

More specifically, I have the following criticisms of the statement. First, the statement fails to adequately consider increased water consumption by the new population brought into Colorado's western slope. Nowhere does the statement offer a detailed analysis of how much water will be needed to support the estimated 33,000 persons who will come into the development area during the initial phase of oil shale development, a fifty percent increase over the present population. The Denver Water Board has estimated that the 1972 per capita

water use in Denver of 226 gallons per person per day will increase to 230 gallons per person per day by 1980, the date when the prototype plants will be in full operation. Based on these and other figures, we can estimate that each person who comes into Western Colorado because of oil shale development will consume between 80 and 160 gallons of water per day. Each year that will mean at least an additional 1,577,895,000 gallons or over 6,000 acre-feet of water per year for increased domestic needs. This is over and above the 15,000 to 23,000 acre feet of water per year needed for production at the two prototype plants alone. Water is probably the most scarce commodity in Colorado; it is the key factor to be considered in evaluating the impact of population increase in any part of the state, particularly the arid western slope. Yet, the draft statement makes only passing reference on page IV-14 of Volume I of the need for "development of a water plan to consider regional, municipal, and industrial water supply and water disposal." Similarly, the draft statement offers contradictory water use projections for combined domestic and industrial uses. On page VII-1 of Volume I the statement cites combined domestic and industrial water use parameters of 116,000 to 164,000 acre feet per year for 1,000,000 barrels per day production; figures of 80,000 to 125,000 acre feet of water per year for the same level of production and the same uses are then given on page VII-5 of Volume I. However, neither projection for domestic water use is supported by any kind of analysis or data in the statement; it is as if the figures were plucked from different parts of the air.

Second, the statement fails to adequately consider the impact of oil shale induced population growth on land now devoted to agricultural use. Agriculture, like oil shale extraction, is a wealth-producing use of land--housing and streets are not. Therefore, the effect on agricultural lands near population centers in western Colorado is of significant importance to the economy of western Colorado. Yet the statement, while mentioning this problem, offers no solution and makes no cost-benefit analysis of the change in land-use patterns from agricultural to urban and suburban use.

Third, the problem created by increased pressure for municipal services and expenditures in Western Colorado are inadequately treated in the draft statement. While the statement makes several estimates of increased tax revenues, the statement neither relates these figures to realistic estimates of increased local revenue needs nor discusses the problem of intergovernmental transfer of revenues from government units experiencing the increased tax revenues to units sustaining the increased demand for public services. From all indications, population growth will take place primarily in Mesa and Garfield counties and the cities of Grand Junction, Meeker, Rifle, and Glenwood Springs, but 80 percent of the estimated increase in the local tax base will be generated by the oil shale facilities in Rio Blanco County; therefore, only 20 percent of the additional tax base will be in counties and cities bearing the brunt of the increased demand for public services. How do we get the needed taxes from Rio Blanco County to Mesa and Garfield Counties and Grant Junction and the

other municipalities? The statement offers no ideas. Furthermore, the statement inadequately considers the probable demand for better public services than are now available in any of the cities, towns, or counties involved. The new population will probably want services not now available on the western slope of Colorado, services that will have to be provided by local government. Where do the new taxes come from? On page III-32, Volume I, the impact statement considers this problem only with respect to the effect on immigrants' expectations. The statement does not adequately discuss the sources of needed additional revenues. True, some of the new taxes will come from the increased property tax base created by the new homes, support businesses, etc. in each locale. But, for several reasons, these revenues will most likely be inadequate to meet all needs: first, there is a time lag of approximately 36 months between the time a new property is added to the tax rolls and the time when it produces tax revenues; second, the numerous trailer parks that will develop because of projected housing shortages, will not add significantly to the tax base but will add a disproportionate burden to the demand for public services; and third, per capita municipal expenditures may increase at a marginally higher rate than the corresponding increase in local tax revenues. The importance of these considerations is self-evident, yet they are not treated in the statement as significant tax problems, but are merely presented as problems that new and old residents will have to live with. Furthermore, increased public capital needs are not considered. Figures produced by the Inter-County Regional Planning

Commission for projected costs of growth in the Denver metropolitan area suggest that public capital costs per new family coming into an urban area will be $11,500 in 1971. This figure could easily double by 1976 or 1980. It covers expenditures for streets and highways, schools, water facilities, parks and recreation, hospitals, sewage disposal, libraries, fire protection, and police stations. If 12,000 new families are brought into the western slope of Colorado, then the increase in capital expenditures for the effected municipalities and counties could total at least $138,000,000. Yet, despite the enormity of this figure, the draft statement offers no estimate of how the counties, towns, and cities are going to meet the added expense. A further complication arises when we consider the impace on bonding, the most likely way to finance these capital expenditures. Since the level of permissible bonded indebtedness is a function of the aggregate tax base in the government unit, the fact that the greatest increase in tax base will not correspond to the greatest need for new capital expenditures means that a city like Grand Junction may not be able to float enough bonds to meet these increased capital construction needs. Once again, no word from the environmental statement.

A fourth area of concern not covered in the statement is the question of how oil shale induced population growth fits into the total growth picture for the entire state of Colorado. Many people feel that the amount and distribution of growth is the most important issue facing state and local government in Colorado. It is generally accepted that, even without oil shale development, the state's population

will increase by 1.6 million persons by the year 2000 and that most of this increase will take place on the Front Range, creating a hugh megalopolis from Ft. Collins to Pueblo. This is exactly the kind of problem, now so overwhelming on the eastern seaboard and in California, that can be avoided in Colorado if proper safeguards are enacted--immediately. In its Final Report of March, 1972, the Colorado Environmental Commission, appointed by Governor Love under state statute, argued that Colorado has "reason to be concerned over both the growth and distribution of population in this state," and urged the "institution of a state population distribution and planning process." The Commission recommended that, "The General Assembly enact a policy of rural revitalization, without stimulating in-migration." To accomplish this goal the Commission urged the state to encourage, "any industry locating in Colorado to employ local or indigenous skills and talents rather than importing them." The issue boils down to this: We must stop encouraging people to move into Colorado from out of state, and at the same time we must redirect any natural growth within the state away from the Front Range to other parts of the state, including the western slope area involved in the proposed oil shale program. For oil shale development to fit well into a rational program of population distribution in Colorado, it is quite conceivable that a necessary component of the development plan would have to be either prevent or at least seriously curtail the influx of persons from out of state who would come to Colorado seeking jobs in the oil shale business. There is little question that this would happen, and, I might add, the impact

statement does mention the issue of in-migration in one clause of a single sentence. But the statement gives no real estimate of the level of that migration. We might learn from the experience of Detroit after the 1967 riots when the city fathers announced the creation of 50,000 new jobs to curb unemployment in the city. After all the new jobs were filled, Detroit officials found its unemployment had increased. The word had gone out on the job circuit that there were good pickings in Detroit. The same thing happened with the migration from rural areas to northern urban centers, with disastrous effects. To help avoid some of the same kinds of problems, specific migration control measures would have to be implemented. At the same time, the potential development of oil shale offers an opportunity to begin redistributing some of Colorado's present population away from the Front Range to the western slope. Yet the draft statement never even broaches this subject as to how the state and local agencies can deal with these problems when even the Federal Government fails to do so by regulation or through lease provisions.

A fifth problem not covered in the draft statement is the question of what happens to the 33,000 and more inhabitants in Western Colorado who depend on oil shale for their livelihood, either directly or indirectly, when one, several, or all of the plants and mines shut down. The statement gives no estimate of the life-span of either a single operation or the oil shale industry as a whole if fully developed in Colorado. Nor does it discuss the probably adverse effects on inhabitants and the economy of the area that would occur after partial

or complete shutdown of the industry. Again, our own history should have taught us to plan for such contingencies; witness the devastating effect on New England towns of the shift of textile mills to the South and the shoe industry out of the area, or the effect of shutting down military bases in areas that depend on them for a large part of their economic activity. Oil shale promises to have a similarly large role in the economy of Western Colorado in the 1980's and 1990's, yet no plans for such economic contingencies are evidenced in the impact statement.

Sixth, the environmental statement fails to even mention proposed new sources for increased energy demand of the new population, much less discuss the potential environmental effects of increased output from new or existing power plants or the environmental impact of gigantic transmission lines. The statement vaguely considers power sources for the oil shale operations, but makes no mention of similar needs for the people brought in by the oil shale development.

Finally, and perhaps most importantly, the draft statement makes none of the above-mentioned considerations nor any other socio-economic considerations for the impact of a fully-developed oil shale industry in Colorado. The impact statement gives only limited consideration to the socio-economic effects of five prototype plants, accounting for less than one percent of the potential oil shale to be developed in Colorado. This might mean that all of the socio-economic impacts could be magnified and multiplied by a factor of 9,900 percent. It also means that the socio-economic projections made in the statement are

incomplete and practically meaningless. Furthermore, any consideration of ways to rationalize population increases or properly provide for orderly increase in municipal expenditures and tax distribution may ultimately require that an upper limit be placed on the amount of oil shale to be produced at any one time, based upon an evaluation of how large a population and industrial base can be supported on the western slope of Colorado. Given the limited supply of water in Western Colorado and the direct relationship between increased water demand for domestic use and for oil shale production, it may well be that a level of production well below full capacity would be the upper limit on production. No such considerations are offered in the Draft Environmental Impact Statement. The obvious omission of these considerations leads one to believe that technology and profit may once again run rampant over total social and economic needs.

In light of the foregoing criticisms, I offer the following recommendations to help bring the seriously deficient draft environmental statement on oil shale development up to the level of coverage demanded by the National Environmental Policy Act:

1. The impact statement must make a detailed analysis of the increased water consumption demand caused by the oil shale-induced population increase.

2. The statement must consider various ways that oil shale development can fit properly into population growth controls needed throughout Colorado. Specifically, the statement should develop ways, most likely through the leases, to insure that Colorado residents are

given first priority on jobs created by oil shale development, as a way to curtail the projected level of in-migration and to redistribute the present Colorado population away from the Front Range.

3. The statement must make a detailed analysis of the projected increase in municipal expenditures and capital outlays and various alternative methods to properly distribute increased tax revenues.

4. The environmental statement must make a detailed analysis of what procedures should be developed to minimize the economic and social impact of a sudden or long-term shutdown, either total or partial, in the oil shale industry in Colorado, including the possibility that the prototype plants will not bear fruit in a fully-developed oil shale industry.

5. The statement must make a detailed analysis of the environmental impact of new energy sources for the increased population in Western Colorado, including the effects of large transmission towers and wires.

6. The statement must make a detailed analysis of all the socio-economic consequences of a fully-developed oil shale industry in Colorado.

Not until these analyses are properly made can the environmental statement be considered adequate. Thank you.

MR. DAY: Thank you, Mr. Phelan. I will next call on Dr. Richard Bradley.

MRS. ESTELLA LEOPOLD 1/

1/ Transcript garbled - other information indicates that this statement was read by Mr. Robert Turner.

MRS. LEOPOLD: 1/I am Estella Leopold on behalf of the Denver Audubon Society. Dr. Bradley has relinquished his time so that I could read a statement from the Denver Audubon Society.

"We, the Denver Audubon Society Wildlife Workshop, subscribe to the following viewpoints:

A. We believe in the maintenance of total biotic communities with diversities of habitat in order to maintain wildlife for this generation and all future generations.

B. We realize that America needs a national energy policy which not only supports necessary uses of energy, but also reduces wastages, and allows controlled and monitored development of energy sources with a minimum of disturbance to biotic communities."

Consequently, we ask the following questions:

1. What assurances are being made that during all phases of this project every opportunity be utilized to conserve, maintain, and/or restore wildlife and wildlife habitat?

2. Why were the canyons (where there is some water for wildlife at some times during the year) selected for the disposal of mine wastes? What other areas were considered?

3. What are the specifications for restoring disturbed areas to bring back the original community species?

4. Will the wildlife (approximately 30 mammal species and 250 bird species) maintain themselves over the period of time between disturbance of the area and completion of habitat restoration?

5. What consideration has been given that some species

1/ Transcript garbled - other information indicates that this statement was read by Mr. Robert Turner.

will need specific assistance during this time? For example, feeding, nonharassment laws enforced, areas of no hunting, etc.

6. Are there shale oil mining (and/or other mining) development sites in similar semi-arid areas which have been researched for environmental impact and revegetation studies related to wildlife?

7. What certainty have we that the data from those studies would be incorporated into the planning and implementation of this development, to minimize damage to wildlife and their habitats?

8. What assurances are there that the revegetation of disturbed areas will bring back native plant species which will support a continuing population of wildlife?

9. The draft states that additional costs incurred by the operator in coping with environmental damages and habitat restoration may be credited against royalties due the government. Why should the government (the people) bear the costs of environmental damage to public lands?

10. We understand that the steps to be taken to protect the environment are under the control of a mining supervisor. What assurances are being made that people knowledgeable in ecosystem management will have, on a day-to-day basis, direct participation in decision making to minimize ecosystem damage?

We strongly encourage the government to take the innovative and leading role in protection of wildlife."

Thank you.

1/ MR. DAY: Mr. Edward Connors.

1/ Written transcript and recording is garbled at this point so that a brief statement by Mr. Mark Roberts does not appear. Mr. Roberts was contacted and asked to supply a copy of his remarks if possible. However, he did not do so.

EDWARD CONNORS

MR. CONNORS: There is no question but that water can be made available for a prototype oil shale industry in Colorado. The state has definite reservations, however, as to how an estimated 1/4 million acre feet of water can be supplied for a sizeable industry at some future date. Yet, water is said to be one of the three major constants to the full development of the industry.

The main problem regarding water, as we see it, is that full approval of an oil shale program conflicts with a number of other problems confronting the state and nation.

1. To provide such anticipated supplies of water, the State of Colorado has been forced to eliminate considerable agricultural water from its planning.

2. Will the oil shale industry actually be a solution to the energy crisis, or will its full inception merely be a temporary stop-gap which puts off our lack of supply to some future date? Full scale development presupposes our continued dependence on a petroleum industry oriented about the automobile. The Federal Government has exerted precious little energy in examining alternative sources of power which will have to be used.

3. This week the Federal Government is initiating a crash study under former Attorney General Herbert Brownell, on the salinity problem of the Colorado River Basin. This draft environmental impact statement indicates that a prototype program (not mentioning full-scale development) will increase the salinity of the Colorado River at Lee's

Ferry by 1.5 percent without indicating the adverse environmental effects that will ensue in the lower basin states or in Mexico. This salinity consists of excess dissolved sodium salts, primarily bicarbonates and chlorides. Both of these areas are already under duress because of excess mineralization of their water supply. Before any further dilution of the Colorado River in the upper basin is eliminated these deleterious effects will have to be answered for. Even without oil shale, we may be headed for disaster in these irrigated farmlands.

4. At present, the retorting process of producing oil or kerogen from shale requires vast amounts of water that evaporate and thus are totally lost to the watershed. In addition, water of good quality is needed--the very same type that the "river-basin states" need for a dependent winter agricultural industry.

5. Another seeming conflict of water use (and thus confusing to the public) is that the Federal Government has filed suit on Federal lands to maintain minimum stream flows in Colorado and the Rocky Mountain West. While laudable, this is yet another claim on an already over-appropriated Colorado River--that is, unless the purpose of the suit is to provide a seemingly subsidized water supply to the oil shale industry downstream.

6. No mention is made of an anticipated influx of some 47,000 to 50,000 people into the area in the next 20 years. Such a population would require some 10 million gallons of water a day or approximately 11,000 acre feet of potable water. What is the source of supply for this population?

7. Others have touched on the need for maintaining the quality of water according to the Water Pollution Act of 1972. There must be full control of water effluent by 1976, yet no mention is made on the proposed implementation of such a program in the draft.

8. Most of our reservations revolve around the overly optimistic considerations of groundwater according to the draft. Most of this optimism is based on a lack of knowledge of the environmental effects, as in Volume 1-III-31. Available groundwater of questionable quality is conditional at best.

a) The solution to the unavailability of quality water is treated on p. V-4. Monitoring of water is proposed, but the action to be taken if the supply proves to be adverse is left unanswered.

b) There is no record of any ground water near the proposed areas which will meet the recommended federal standards of less than 500 mg/L of TDS (total dissolved solids). Any amount which might be found would undoubtedly be depleted in a very few years. The vast amount of groundwater in the area, and especially that which will be brought to the surface after a few years of operating open pit mines, is of unbelievably poor quality. Some wells to the east of the Piceance Creek Basin have produced water two times as salty as sea water, and the minerals found are primarily sodium bicarbonate and sodium chloride, which are amount the most undesirable possible in this area.

9. Vast amounts of highly saline water, which cannot be used in the process, must be disposed of in some way. The report mentions "treatment" of this water in a number of instances; but today there exists no economically feasible method of removing sodium and chloride ions from solution, and thermodynamic considerations (which have extremely high energy requirements) indicate that no such method is likely to be developed in the foreseeable future. Bicarbonates can be transformed through various processes to sulfates or chlorides, but these are equally undesirable and virtually impossible to remove.

10. Since the salts cannot easily be removed from the water, the only alternatives remaining are to remove the water from the salts or to dispose of the water through deep pressure wells. The possible deleterious effects of the latter are well enough known that this process is no longer seriously considered in other waste disposal projects in the country. Evaporation then remains the only feasible alternative, and the costs of this, in both economic and environmental terms, should be added to the process.

11. There is also the matter of leaching of salts from the spent shale and over-burden deposits. The draft indicates this problem has been dismissed completely on the basis of a single small scale experiment which showed that moisture added to spent shale caused an impervious layer to form on the surface, thus preventing the downward percolation of rainfall or other applied water (page I-25). In numerous other places in the report, however, are illustrations of the revegetation procedures which are proposed for the waste piles.

Since the roots of surface vegetation, combined with soil micro-organisms working in the organic context of the soil, inevitably result in a very high infiltration rate, it will be impossible to have both revegetation and an impervious cover.

If the choice is revegetation, much of the rainwater, plus the proposed 12 inches per year irrigation water to be applied to the restored plots, will percolate downward through the soil. Unlike the natural soil cover, which has been thoroughly leached of highly soluable minerals over the centuries despite the relatively low precipitation, the new "soil" will be composed of finely divided particles with a high pore space fraction (even after compaction) and will contain extremely high contents of sodium, bicarbonate, and, in some cases, chloride. The resulting leachate can be expected to have concentrations of their constituents comparable to that of the deeper groundwater. Because of the fact that the tailings piles must be at high elevations relative to the valley bottoms, and also because of the high porosity of the tailings, this highly saline water will inevitably reach the surface streams, resulting in further contamination of the already saline Colorado River which will be of considerable magnitude.

The other alternative, that of retaining a barren cover on the tailings, will actually have similar results. Since much of the precipitation in the area comes from brief but intense thundershowers, considerable erosion can be expected from a vegetation-free surface. Again, unlike the runoff from the present natural surface, the silt carried off by the streams will contain a sizeable fraction

of soluable minerals which cannot be removed by settling alone. The end result will be, just as above, pollution of the Colorado River of the type which will be most damaging of all.

This pollution is likely to go on for centuries after the oil shale operations have ceased, and is likely to become one of the major contributors of salinity in the Colorado River. It is absolutely impossible to achieve the contradictory results foreseen by the USDI (revegetation plus an impervious, non-polluting surface layer) in its analysis of this source of pollution, and the neglect of this serious problem in the environmental statement indicates a seeming disregard for the welfare of the nation on the part of those who have been charged with protecting the public's interests, for though adverse environmental impacts are mentioned in the draft, the green light is being given to a prototype industry. We feel that the above real concerns to the people of Colorado and Colorado River water users have to be answered before any further development is approved on Federal lands.

GARY PARRISH

MR. PARRISH: My review of the draft environmental statement concerns socio-economic planning. How will the development effect the existing population, and how will new people be provided with necessary services? The statement is very inadequate in this area.

Many people viewed the National Environmental Policy Act of 1969 as an end to planning in a vacuum. Section 102 of the Act requires that:

A. A systematic, interdisciplinary approach be utilized...

C. A detailed statement on

(i) the environmental impact of the proposed action

(ii) any adverse environmental effects which cannot be avoided...

(iii) alternatives to the proposed action

F. make available to the states, counties, municipalities, institutions, and individuals advice and information useful in restoring, maintaining and enhancing the quality of the environment. In my opinion, unless the socio-economic considerations in the final impact statement substantially enlarge upon the draft comments, the environmental impact statement on oil shale production will be seriously deficient.

The draft environmental statement does not adequately cover several major impact areas. The first is the possibility of varying population levels. Oil shale plants could be started up, run for a period of time, then shut down--restarted--and shut down again. Economics plays a part in this possibility and relates directly to our energy needs. It is felt that a comprehensive energy policy is needed to truly evaluate the likelihood of this impact. Without such a policy there is much more chance of a "Boom and Bust" situation. The statement does not concern itself with the boom and bust potential, a very real possibility. The writers of the statement should look into the impact of shutting down the ABM construction projects, the problems created in many areas of the country with the construction of missile

bases, and problems in areas like Las Cruces, New Mexico, whose economic well-being goes up and down as government contracts come and go at nearby White Sands Missile Range. A complete study of our energy requirements would provide a better look at the future of oil shale, as well as the need to develop other resources. Similarly, the draft statement does not adequately consider decreased per capita energy demand in the future as people readjust their energy-use habits. Pollution control programs and other cost-increase pressures may easily raise the cost of certain forms of energy to a level at which many consumers will change their habits. For example, as the costs of operating a private automobile increase, any car owners may choose to rely more on mass transit, decreasing projected demands for gasoline and oil. Would we still need to develop oil shale at this point in time? What would be the socio-economic impact of curtailing oil shale production at some future date because of such decreased energy demand?

The second area which the statement does not cover and which cannot really be evaluated without a good study of our future energy needs concerns the impact of a fully-developed oil shale industry. In short, what is the impact of an ongoing oil shale program expanded far beyond the proposed leasing? If economical production of oil shale is achieved and energy demand is sustained, what is the impact of the ongoing program? This is an area which needs to be covered in detail.

Once the various impacts are defined in detail, it is then

possible to work on solutions to the problems, rather than just say there are problems. Some of the potential problems can be solved by Federal actions, and others could at least be presented to the states, counties, and municipalities, with possible solutions as required by Section 102(F) of N.E.P.A.

The third area is land speculation. Any potential influx of people can cause land speculation. Speculation in land causes an increase in land values, and in turn an increase in property taxes. The speculator generally is favored by our tax structure on both the Federal and State levels, while the people in the area not wishing to sell their land have a very real problem. The increase in land value and taxes is not matched by an increase in productivity of the land. In many parts of Colorado people are being forced off the land by increasing taxes based on speculative land values. What is the impact of land speculation on the present population? What can be done to minimize or alleviate the impact of land speculation?

Fourth, with the first influx of people comes the housing impact. Anyone who goes into a boom area is familiar with what happens to housing. The house that once rented for $80/month goes to $160/month as construction starts and to $240 and up as people flood into the area. This is fine for the people who benefit from the boom. The wages of the construction worker may reflect high housing costs, but what is the impact on the person who pumps gas or works in the local store? What is the impact on a large percentage of the existing population to whom the project will mean higher costs with no

equivalent increase in income? What actions should be taken to protect these people?

A fifth impact which has not been adequately considered is the potential influx into the area of people looking for work, people who do not have jobs, and may not even be qualified for employment in oil shale, but who are drawn to the area in search of some kind of employment or a better paying job. Just what is the potential? What is the impact on services or welfare rolls? And what is proposed to control or eliminate this potential problem? Similarly, will this project add to the state's total population? Can preference be given to people in the particular states who are unemployed or under-employed? Can population be relocated from presently congested urban areas in Colorado and Utah into the areas where oil shale is being developed? Or will additional people be brought in from outside the area?

There are many problems created by a growing population. First, as an area becomes urbanized, there is an increased requirement for services. Many of the required services are in existence, but would require expansion. Others may not be presently provided or if provided will require up-dating far above the level of services presently provided.

The first problem in providing services is timing--having the services ready when the people are there. Construction often requires more people than plant operations; even if the numbers are equal, there can be an overlap, operating personnel on hand during

construction or a gap between construction and plant start up. The draft statement assumes a smooth transition between construction and plant start up and a continued steady operation. To restate the boom and bust potential, there is the potential for a widely fluctuating service demand which is not covered in the statement. A second problem that goes along with the first is how to finance the services. As in many present urban areas, it is possible that the requirement for residential services will be in one area, while the industrial or business tax base is located in another area. The impact statement points out this problem for Colorado, but does not suggest any solutions. Yet there are several possible solutions. The Federal Government could rewrite the lease so that the plant becomes Federal property and thus does not go on the tax rolls. The lease could require that payments be made on a voucher system in lieu of taxes. This system is presently used by the Federal government to provide aid to schools in areas of major governmental installations. Or as an alternative a regional authority could be established by the states or districts involved. The Federal in lieu of tax-voucher system would be easy to establish but would not cover any developments outside of Federal lands. A regional system would cover both private lands and facilities on Federal properties, but with the problems of intergovernmental cooperation that presently exist, a regional government would be hard to form.

Simarly, unless there is a very high probability of a continued level of a demand, then alternative methods of financing

capital investments besides the issuance of municipal bonds should be considered. Schools, water and sewage facilities, etc. are normally financed by long-term bonds. The refunding of said bonds is normally figured on increasing use. So if for any reason the number of users decreases, the remaining people are left with an overall lower level of income and a higher tax bill not to mention a stagnant economy.

Since the "crude oil" is being sent out of the area for further processing, what is the impact in terms of population, pollution, etc. on the area where the refining will be provided?

Due to the length of the draft statement, and the general unavailability of the statements, an additional 30 days to file written statements is requested. This would provide citizens time to do a more detailed study of potential problems and solutions to the problems than we have been able to make at this time.

In addition, as a private citizen, I would like to make one final comment. It is evident from all the testimony we've heard today that this nation is in drastic need of leadership from the top in the area of resource utilization and energy demand, and this type of leadership is simply not present at this time.

Colorado primary elections illustrate the pitfalls of politicians who continue to refuse to recognize the demands of the people for truly balanced leadership in the direction of the utilization of our finite supply of natural resources including oil shale resources and environmental resources.

MR. DAY: Mr. Charles D. Hoertz, Ashland Oil Company.

CHARLES D. HOERTZ

MR. HOERTZ: Mr. Chairman, ladies and gentlemen, my name is Charles D. Hoertz, Manager of Research & Development, representing Ashland Oil, Inc., of Ashland, Kentucky, an independent refiner which processes over 350,000 barrels of crude oil daily.

We have reviewed the draft environmental impact statement submitted by the Department of the Interior on the proposed prototype oil shale leasing program. We appreciate the tremendous amount of work and time which is reflected in this three-volume statement. Staff members of the Interior Department and the various state and federal agencies are to be commended for their efforts.

Ashland Oil is involved in the energy industry at both the domestic and international levels and is deeply concerned with the timely development of a viable shale oil industry. As an independent domestic refiner, we find our corporate position analogous to the energy profile of the nation. In terms of crude oil it is even more critical. In order to supply our refineries we have to bring in nearly 30 percent of the crude from outside the continental United States, and believe this quantity of foreign oil will need to be increased substantially within the next year, as will the nation's. We note that domestic reserves are being consumed more rapidly than they are being replaced, and our need for foreign crude is increasing, as is the nation's.

Our concern, however, is not limited to that of a competitive

company in the energy industry. Rather, it reflects the much broader need of our nation to maintain adequate energy resources for national security and economic purposes. I would like to elaborate on these two points briefly.

First, as noted in the impact statement, the United States has a growing demand for energy. The Department of the Interior, in its most recent report on the energy outlook for the United States, forecasts that the per capita demand for energy will increase 70 percent by 1985. Known reserves of energy from currently available traditional sources within this country cannot meet this expected demand.

We are now some 1.5 million barrels per day short of crude oil that we must cover by imports along with another similar amount of residual fuel oil, and our dependence on foreign sources is increasing.

The majority of the world's oil reserve--and oil is the principal form of energy utilized today--is located in the Middle East. Without intended detriment to the governments of these Middle East countries, theirs is a long history of political instability and insecurity. Daily developments in these countries attest to this circumstance. For example, just last week several major western oil companies agreed to a new arrangement with the Persian Gulf states which would reportedly provide these Middle East nations with as much as 51 percent ownership in petroleum production formerly controlled by the oil companies. A House Foreign Affairs report issued the same

day urged the U. S. to "take all possible steps to minimize our future dependence" on these energy sources. This report said the Middle East countries "hold the trump cards" in dealing with industrialized nations. We, as a nation, cannot rely on increased imports of energy from foreign sources to meet our needs. From a security standpoint alone, the need to maximize domestic energy resources is obvious.

Second, the news media is continually highlighting the international economic situation of the United States. An example of our present position was recently demonstrated by the devaluation of our currency to place us in a more favorable--and competitive--position in foreign trading.

Imbalance of payments between the United States and foreign governments is now a serious problem. If we are forced to import more energy sources, our country's international trade position would further deteriorate.

Our present emergency has not entirely arisen from international factors, but stems from our burgeoning national needs and our new awareness of environmental needs. The measures promulgated and planned by the Environmental Protection Agency have complicated and made refinery processing more expensive. "Clean air" measures force a greater use of crude oil and gasoline than before.

Measures of increasing severity have reduced coal operations in many areas. Construction of nuclear powered generating plants have been retarded by environmental arguments. New Federal regulations

governing automobile emissions are estimated to increase petroleum consumption demands in the United States by as much as 1.3 million barrels of crude oil per day when they are in full effect.

It is obvious that development of additional forms of domestic energy supplies is necessary. And of the domestic energy resources, the one with the highest potential is the vast shale oil deposits in Colorado, Utah and Wyoming.

Oil shale's potential has been discussed for more than fifty years, but several factors have prevented the full scale development of this technology.

Economics is one such factor. Because of the processing expense of oil recovery from shale, this approach could not compete with cheap domestic or foreign crude oil supplies available in the past.

Until recently the technology was not proven. And, even now, although successful pilot plant and semi-works studies have been conducted in recent years, many problems still exist with the mining and retorting methods.

A prototype program could be the most practical avenue to resolving these various problems and we must proceed immediately.

As the impact statement says, "Delay or postponement of the proposed program may reduce the available time that is needed to resolve many technical and environmental uncertainties...Prolonged delay may leave no alternative but to react eventually with a crash program to develop shale oil."

We believe the impact statement's conclusion is far too

conservative. We are in a critical situation now. The crisis is not in the future but in the present. Therefore, we believe this prototype program is imperative and the sooner it is implemented the better.

Finally, I would like to comment briefly on the possibilities such a program offers.

First, it offers an unprecedented opportunity to apply the knowledge gained over recent years in environmental protection. The impact statement section detailing the proposed lease program outlines built-in safeguards to insure sound ecological practices in the areas of air, water and solid waste pollution.

Second, the project as a whole could become one of our nation's first attempts into total resource management. The prototype program offers the opportunity for latest advancements in technological, sociological, and ecological practices to be applied and evaluated. Information gained from such an experiment would have further application throughout the industry and nation.

Let me elaborate on this point. Most industries now in existence have developed haphazardly over the years. Because of the lack of knowledge of the full interplay of social and technical sciences involved, errors have been committed that are only recently being corrected.

In the oil shale leasing project, we would in effect start at ground zero to develop an entire new industry--one guided by the new-found knowledge and concerns of our country. It would be

a massive undertaking, requiring much flexibility and the full cooperation of government agencies, private interest groups, and industrial operations.

In summary, Ashland Oil supports the concept of a prototype oil shale leasing program, and believes it is essential to the nation that it succeed. As a prospective participant in such a program, Ashland Oil agrees with the findings of the draft impact statement and considers it an adequate review of the factors involved. Ashland Oil believes the program proposed can achieve immeasurable benefits to America.

Thank you.

MR. DAY: Carl J. Snow.

JEANNE P. FOSTER 1/

1/ MRS. FOSTER: I am Jeanne P. Foster and I am appearing here on behalf of Mrs. Snow whose employer found it economically unfeasible to let her off today. This is to the Chairman, Oil Shale hearings and regards the impact of oil shale development in Colorado on birds of prey.

Mention has been made in the environmental impact statement of the fact that eagles and hawks are year-long residents of the Piceance Creek area. Mention has not been made of the fact that this area is also a portion of the major wintering ground in the state of Colorado for golden eagles. Also, the stretch of the White River between Meeker and Rangely is a major wintering area for bald eagles.

The preasure of increased human activities in these areas

1/ Transcript garbled at this point. Other information indicates that this statement was made by V. Crane Wright.

may be sufficient to force the eagles into less than optimum habitat. This could be especially detrimental for the bald eagle, which is an endangered species. If these birds are forced into areas which are already occupied by other eagles, the amount of food and shelter available to each eagle will decrease, and in fact may be a critical enough difference that mortality may increase.

There are perhaps 750 breeding pairs of bald eagles in the continental United States. The loss of even a few more bald eagles than usual through displacement or actual harassment from oil shale activities could have a significant effect on the total bald eagle population.

The population status of other species of birds of prey would also be affected. Many hawks and owls are quite intolerant of human activities and will not reproduce during breeding season. The disruption of suitable nesting habitat through oil shale activities would also be detrimental to their welfare. Total populations in these areas could be seriously reduced. Since the status of several species such as the ferruginous hawk and burrowing owl is undetermined, the overall impact of oil shale development on birds of prey may be even greater than is initially suspected.

Upon examination of the impact statement, I could find no listing of the species of hawks and owls resident in these areas, nor were there any population estimates. I do not believe that adequate investigations were conducted to determine what impact oil shale development will have on birds of prey. Such studies as necessary

should be conducted before any actual prototype development begins.

Thank you.

MR. DAY: Mr. Donald Davis.

DONALD DAVIS

MR. DAVIS: My name is Donald Davis, and I am speaking as a private individual. I would like to be rather brief in my remarks, since I have not been able to read the draft environmental statement except in a very brief statements. But it has been my impression that the details that have been emphasized a great deal by most of the speakers at this hearing have not considered to the extent that might be done the overall implications of what is being considered here. We seem to have the prototype developments under consideration. An industry which would involve much more enormous mining activity than has ever been done on earth before as far as I know at least.

Although the industry representatives in the draft statement have considered the environmental impacts of this, it would seem they have not been very convincing to the effect that more than a token amelioration of these effects could be accomplished by this. Now I think of the earlier involvements in potentially enormous alterations of the environment. But perhaps our best guide is what has happened. From the closest approach to this which has been done in practical activity in the past, and see the effects of large scale mining on people living in Colorado near the Climax area. It really has been enormously devastating to the area of that mine, and while those people speak of the various factors to be dealt with--the new

techniques.

They seem to be confident that they can do it. I submit that we have no real reason to believe that this is true and that the effects, first of all, from indirect dumpings of the tailings of the mine are obviously going to be devastating. One of the last speakers, in fact, emphasized the fact that you could not have both revegetation and impervious and relatively non-errodible conditions that are non-productive mineral contaminants of water.

Then, of course, you have the population difficulties involved in grossly increasing the population west of the slope by the people involved in this industry moving in; and then you have the air and water problems and various people have submitted suggestions as to what could or could not be done about this--contradictory suggestions which are not again, very comforting with regards to the actual likelihood that they can really not only prevent damage, because as the Atlantic-Richfield representative said this morning, actually improve the environment.

This seems incredible that the environment could be improved by this sort of thing. I submit really that what we should be considering is not the simple issue of oil shale along, but the overall situation which has led to our considering it in the first place, that is the social situation in the United States and, indeed, all the industrialized cultures that leads to the remarkable situation which is expressed in the draft statement where we have an increasing demand for energy--four percent a year was said at one point--where the

population is increasing only by about one percent a year. It's almost alarming, but we should ask the question rather as to why this energy requirement should increase at four percent a year, and what will happen in very short order in terms of effectiveness perhaps? Perhaps even less if it continues to increase at this rate.

It seems inconceivable to me that any form of energy could be adequate to deal with such insatiable demands by huge numbers of people. We simply can't do this indefinitely, and we should start seriously--and I do mean seriously--not superficially, considering alternatives to this continued increase in both the population and the demands made by the population on resources, energy, as well as other resources. If we do not do this, I can only see cataclysm ahead.

The technical advances that the industry representatives seem to feel will deal with the adverse effects of this are at best dubious, and we can only look into the technological advances of the past and the great claims that were made for them--and I have in this case pesticides in mind. I only find that the more such advances are made, the more problems that are unforeseen seem to come with them. So that I would like to call now for a reassessment of our entire social pattern and our aims as a society before we consider further devastating and enormously larger effects on the environment. Not only in this, but in other fields--the harms which have been done in the past.

Thank you.

MR. DAY: Mike Lekas

MIKE LEKAS

MR. LEKAS: Geokinetics has been requested by the Department of the Interior to comment on its draft environmental impact statement for the prototype oil shale leasing program.

We fully support the goal of the program as stated in the environmental statement as follows:

"The goal of the Department of the Interior's proposed prototype leasing program is to provide a new source of energy for the nation by stimulating the timely development of commercial oil shale technology by private enterprise, and to do so in a manner that will assure the minimum possible impact on the present environment while providing for the future restoration of the immediate and surrounding area."

However, we find that the proposed procedures for awarding the leases are contrary to the goal of the program, and in various ways would be harmful in establishing a health, competitive and technologically advanced oil shale industry.

In the proposed procedure, the leases would be sold to the highest cash bidder. No other consideration would be involved other than certain general guidelines to protect the environment.

We feel that procedures should be developed by Interior, and incorporated into the selection procedure, to achieve the following objectives:

OBJECTIVE I

Guarantee that independent oil producers are represented in

this new industry, and that it does not become a monopoly of the major oil companies.

OBJECTIVE II

Provide that those companies that lack adequate reserves of oil shale land have priority in securing leases over those that already hold adequate oil shale reserves.

OBJECTIVE III

Encourage testing and development of in situ technology that would minimize surface impact, and could lead to lower cost oil for the consumer.

We wish to comment further on these objectives. The purpose of the leasing program, as stated in the impact statement, is to provide oil shale land to industry in order that industry may develop commercial oil shale technology. Only six leases are offered, and of these, most of the interest centers on two leases in the Piceance Creek Basin of Colorado. As an indication of the interest in the Colorado leases, of 23 sites nominated by industry, 17 were in Colorado. The entire industry is competing for these very few tracts. It is imperative, therefore, that the leases be distributed in such a way as to guarantee the objectives of the program rather than that they be sold to the highest bidders.

OBJECTIVE I

Various major oil companies control practically all of the non-government oil shale land in the area. They have enormous financial resources and could offer cash bonus bids that no independent or group

of independent oil companies could hope to match. Since the number of desirable leases is very limited, the result of the present bidding procedure would be to put the new industry entirely into the hands of the major oil companies, that already control the private oil shale land. Since the program announcement states that there will be "no further leasing of government lands for an indefinite period of time," these few companies will have established effective control of the oil shale industry and all others would be excluded.

OBJECTIVE II

In many cases the private oil shale lands have been held for many years by major oil companies that have made no determined effort to put the lands into production. There are other companies without oil shale lands that wish to acquire the government leases. Those who already have oil shale lands do not need more to carry out a development program. Therefore, those without lands should have priority in the granting of the leases.

OBJECTIVE III

There are companies interested in developing new techniques for extracting shale oil other than by the use of conventional mining and surface retorting methods. A company that wishes to develop an unproven process cannot pay a large bonus for the land on which to experiment, for it has no way of knowing at the inception of the work if its technique will be successful. Such companies must inevitably be outbid by those who plan to use conventional technology. Thus, the program allows no opportunity for the development of an in situ

technology that would permit oil extraction with minimum damage to the surface, and that could lead to lower cost oil for the consumer.

Room and Pillar mining has been demonstrated in four large oil shale mines in the Piceance Creek Basin and there are many large blocks of land controlled by major oil companies that are more amenable to this method than any of the six sites being offered for lease. Therefore, none of the limited number of Federal leases should be granted for purposes of Room and Pillar mining as there are already adequate lands suitable for this purpose in the hands of the industry.

MR. DAY: Gordon Rodda.

GORDON RODDA

MR. RODDA: This is a statement by Gordon Rodda for the University of Colorado Wilderness Group. In addition to this statement, we will submit a written statement at a later date.

Throughout today's hearings there have been many remarks directed at inadequacies in the proposed environmental impact statement. Others have noted deficiencies in the impact statement's coverage of secondary projects, salinity, population growth, tailings, the Flattops Wilderness deletions, power requirements, air pollution, economic justification, the ability of the project to perform its assumed stop-gap duties, and the overall magnitude of the project. Having read parts of the statement, I have found it to be incredibly vague and inadequate for a project of this size. It is precisely this latter point which so disturbs me.

Given the magnitude of the problems that have been so adequately criticized today and so inadequately covered in the impact statement, I find it incomprehensible that the Department of the Interior has neither impressed upon the public the importance of this matter nor scrapped the project until a complete impact statement has been written. The very lack of citizen representation at the hearing today is evidence of the lack of publicity this hearing has been given.

Such secrecy will lead to further deterioration of citizen support for potentially environmentally adverse projects within the Rocky Mountain Region.

We regard this project as the greatest yet in a long line of governmental attempts to press blindly forward with possibly devastating projects without the benefit of broad-based citizen awareness. We vigorously object to any further implementation of this project until such time as a complete environmental impact statement has been carefully scrutinized by a substantial sector of the citizens of Colorado and generous consideration given to their responses.

Thank you.

MR. DAY: Raymond Mohr.

RAYMOND MOHR

MR. MOHR: My name is Raymond Mohr. I have come to this hearing to speak on behalf of the Colorado Environmental Health Association. I do not speak for my employer, the City and County of Denver, Department of Health and Hospitals.

It is my understanding that testimony taken at this

hearing should be directed to the preliminary environmental impact study as provided. However, because of the exclusion of certain areas of concern to my organization, reference to the study will necessarily be oblique.

My testimony will cover anticipated impact on: health services, medical and dental services and facilities, availability of personnel in the health fields, water quality and supply for municipalities, sewage disposal systems (both individual and municipal) and other closely associated environmental health matters that will occur when this area containing only 1.7% of the states population becomes a small urban center in a very short period of time.

According to figures and statistics obtained from Colorado Comp. Health Planning Council the entire northwestern area of the state is woefully lacking a satisfactory health care system. There is no organized regional or county health department, for intents of and purposes, no hospitals or emergency care system, and only a small number of doctors, dentists and other health professionals. Hence if no effective health system exists one must be developed. This raises some important questions. How will almost a complete health care system be funded? Who will pay the cost of developing and maintaining such a system? How soon would a health system be able to be in operation? In my opinion the impact statement discusses none of these problems. As a matter of fact, figures from the state Comp. Health planning office show decreases in the populations of Moffat and Rio Blanco counties through 1980. This indicates

possibly the impact study was prepared without consulting state planning agencies.

The impact statement makes no mention of how municipal water quality and municipal sewage effluent will be able to be maintained in compliance with state and federal standards. Since over half of the population is currently on a municipal system of some sort, planning and funding will have to be done to ensure adequate, safe water as well as complete and efficient municipal sewage systems in the target area.

In closing let me say that I have not gone into detail at this time but a more detailed critique of the impact statement will be forthcoming by the October 23 deadline. I do want to reiterate the intent of the Environmental Policy Act as I as a health environmentalist interpret it. That is to ensure that actions of man will not endanger the quality and health of the environment in any way.

MR. DAY: I think everyone has been called who wished to appear today, and the hearing will stand recessed until tomorrow morning at 9:30 o'clock a.m.

(Whereupon, at 4:45 o'clock p.m. the hearing in the above-entitled matter was recessed to be reconvened the following day.)

UNITED STATES OF AMERICA

DEPARTMENT OF THE INTERIOR

In the Matter of:

DRAFT ENVIRONMENTAL STATEMENT FOR THE PROPOSED PROTOTYPE SHALE LEASING PROGRAM.

Federal Center Auditorium
Denver, Colorado
Wednesday, October 11, 1972

Met, pursuant to notice, at 9:30 o'clock a.m.

BEFORE:

JAMES M. DAY, Director, Office of Hearings and Appeals, U. S. Department of the Interior.

PANEL MEMBERS:

REID STONE, Oil Shale Coordinator.

ANDREW DE CORA, Bureau of Mines.

ALBERT LEONARD, Bureau of Land Management.

KENNETH ROBERTS, Bureau of Sports Fisheries and Wildlife.

* * *

I N D E X

1/ Joan Foster should read Mrs. Jeanne P. Foster.

2/ Bowman should read Bollman.

P R O C E E D I N G S

MR. DAY: The hearing will now come to order. The hearing is for the purpose of receiving comments on the draft environmental statement for the proposed prototype oil shale leasing program, as mentioned yesterday to obtain comments from those wishing to comment on the program. Those who desire to supplement their oral presentation at this hearing should send their information to the Director, Office of Hearing Appeals, 4015 Wilson Boulevard, Arlington, Virginia. They should be received on or before October 3, 1972, for inclusion in the record. A transcript of the public hearing will be prepared and the final environmental statement will reflect the comments at this hearing. Complete copies of the transcript can be obtained by making arrangements with the reporter. Copies of written statements can be directed to the Office of Hearings & Appeals and all comments will be carefully considered in the Environmental Policy Act of 1969. Are there any people here who desire to present a statement at this time?

MR. DAVIS: My name is Donald Davis and I am speaking for Mr. J. Blain Colton of the Colorado Grotto of the National Speleological Society.

STATEMENT OF MR. DAVIS

MR. DAVIS: It is the considered viewpoint of the Colorado Grotto of the National Speleological Society that the Interior Department's draft environmental impact statement is premature, inconclusive and wholly inadequate. We feel that the basis for this entire proposal is in serious question; ie. The National energy crisis.

There are a great number of effects by such an operation as oil shale mining that have not been considered by the impact statement. These things considered, we feel that the scope of the statement is far too narrow and recommend that the statement be considered invalid.

We wonder if the Government is taking into consideration its professed role as protector of the interests of its people or is merely making feeble and destructive efforts to control an inflationary economy. We recognize the merits of creating jobs but submit that the price for these is too high.

In order to make a rational decision regarding the necessity for oil shale development, the Interior should have at its disposal a comprehensive energy plan and review for projected energy needs for some time to come. This document does not exist. Furthermore, it is our understanding that the Government cannot even agree as to what constitutes usable energy much less define an energy crisis. It is because of this inadequacy that we consider the draft statement premature.

The statement takes an amorphous stand toward environmental impact in the immediate area of development and compounds its insufficient scope by totally disregarding the impact on adjacent areas. Let us now consider some of these impacts and hope that they will be weighed on the viability scale along with other negative environmental impacts. These make the oil shale proposal a proposal to commit one of the most monumental acts of environmental vandalism ever planned.

The effect of oil shale development on caves, our field of special interest, would be indirect, but nevertheless significant.

If you take the estimated 40,000 people required to operate this industry, including the number of additional people, including police, school systems, medical care and so on, you have a fair sized city. In the mountains to the south and east of the oil shale areas, we have one of Colorado's most unique and most fragile eco-systems. The cave environment. This large influx of population will put a large strain on all of the outdoor recreational facilities including the caves.

Nature, fortunately, has a wonderful ways of regeneration and if an area is over-hunted, if it has too many trees cut down or if it is over-fished, it will regenerate itself to a certain extent by simply restricting use of that area. Not so for the caves. While it may take hundreds of years to refoliate a forest, it takes millions of years to create a cave. In short, the caves we have now are essentially all that we will ever have. The predicted influx of people to Northwest Colorado will be far more than the delicate cave environments can bear without serious damage.

Of even greater consequence is the statement's neglect of where the necessary water is to come from. This will have far reaching effects and disasterous consequences if the industry is not restrained in its acquisition of water. The oil shale industry should be restricted in its use of water by a comprehensive state-wide water use plan. This plan should be a guide for all future water use and a realistic projection of needs. Again, however, such a document does not exist. The impact of oil shale development cannot possibly be

determined without consideration of precisely where the water is to come from.

Interior maintains that between 80,000 and 125,000 acre feet will be used to operate the industry's projected production of one-million barrels a day. Interior does not, however, consider the amount of water to be consumed by the great population boost. Nor does it consider the amounts of water consumed by the power plants necessary to maintain the shale mining operation.

Interior does not mention where the water will come from or how they propose to get it there. Furthermore, Interior does not mention who will pay for it. Will Interior recommend subsidies from random dam building only to find out that these won't provide enough water or that the dams have reduced the runoff to the point where downstream users are cut off? Will Interior recommend subsidies for pipelines to bring in water from distant sources only to find out that the industry is no longer economically feasible? Or perhaps dams will be built just before we realize that fossil fuels are obsolete.

The Flat Tops primitive area and the adjacent White River Plateau is the major source of water in the proposed oil shale area. As it appears now, oil shale development, if it is pushed through, will encourage the random placement of dams and canals as is evidenced by the proposed Yellow Jacket Project. Not only do we find it absurd that the people be forced to pay for destructive damming and canals on their own land for private profit and negligible benefits but we find it a crime that the monumental environmental impact go unregarded.

The Flat Tops water shed is a vulnerable and valuable natural resource. Damming of the streams in the surrounding area will have very great degrading effects. Not only will the dams and the lakes themselves be destructive, but they will require the creation of maintenance roads in what is mostly wilderness, thus encouraging heavy recreational use.

The Corps of Army Engineers is at this moment considering plans to dam and divert the waters of Main Elk Creek, a small tributary of the Colorado River. Damming this creek will have ill effects including displacement of one of Colorado's few remaining big horn sheep herds, inundating several caves and encouraging use of a heretofore pristine area.

This is the prime reason the Review Committee should turn the draft environmental impact statement down. As it now stands, the oil shale proposal is encouraging random and unplanned development of areas adjacent to development sites without having any realistic idea as to what the ultimate cumulative impact will be.

These adjacent areas are one of Colorado's most important natural resources and should not be jeopardized for an industry that is not decidedly viable, desirable, or beneficial. It is for these reasons that we call for the rejection of the draft and call for an end to unplanned development until the industry is both proved necessary by a comprehensive National Energy Statement and proved possible and justifiable by a complete study of available water resources and proved rational by a complete environmental impact statement utilizing quantita-

tive estimates and complete projections of the amount of water to be used as well as a complete study of the impact on adjacent areas. Thank you.

MR. DAY: Thank you, Mr. Davis. Is there anyone else who cares to make a statement?

MRS. GOODWIN: Good morning, my name is Libby Goodwin, and I am President, Boulder Audubon Society.

STATEMENT OF LIBBY GOODWIN

MRS. GOODWIN: A primary goal of our local chapter is educating young and old alike to the marvels of the natural world around us, exemplified by the intricate relationship known as the "chain of life." To this end we have instituted an inventory in Boulder County of all existing wildlife habitat and wildlife. This inventory will be used to assist public officials in making informed and rational land use decisions. Extractive industries in Boulder County are being asked to present extensive evidence of the effects of their operations on wildlife.

I believe the same principle should be applied to the proposed oil shale leasing program. The wildlife habitat and wildlife of the oil shale mining area are an intrinsic value of the State of Colorado which should be available to all citizens to study, to enjoy, and to use in the wisest way. It would be premature to give permission to mine this area before an inventory is made of the existing wildlife population. Then, and only then, can the effects of the mining program on the wildlife be evaluated. Only then can an informed decision be made

which is in the best interests of all citizens of the state.

The Governor of Colorado has authorized a wildlife study which would give the desired information. Until it is completed, the environmental impact statement cannot present an adequate assessment of the effects on wildlife of the air and water contamination which may accompany the oil shale operation. If public lands are to be used for the proposed program, the public is entitled to environmental investigation which has thoroughly covered this important topic.

MR. DAY: Thank you. I will now call on Betty Willard.

STATEMENT OF BETTY WILLARD

MRS. WILLARD: Thank you, Mr. Hearing Officer. I wanted to take a moment of time today to urge that as many people as possible say what they think about the development as to what we need to know because it is a very large area and the possibilities of great development are there. In looking over the structure of these hearings, it will be valuable for the citizens of this state and other states if we could have more time beyond the 23rd in which to put together remarks because most of the citizens are volunteers and they are working hard full time at other jobs, so if we could have more time it would be appreciated, Mr. Hearing Officer.

MR. DAY: Thank you, Mrs. Willard. A number of people have indicated, in fact demanded and requested additional time. The panel is now considering this and we are taking it under advisement and will rule on it probably before the week is out. Are there any others present who desire to make a statement?

STATEMENT OF JOAN FOSTER 1/

1/ MRS. FOSTER: I have to apologize to you gentlemen for not being here yesterday afternoon when my name was called. I understood my time was going to be given to somebody who could use it from out of town. It is very possible that my remarks on the environmental statement are going to seem very mundane and housewifish, compared to the...all the expert testimony that has been going on.

MR. DAY: Could we have your name, please?

MRS. FOSTER: Mrs. Joan Foster, 1/ housewife. Well, I'm a housewife and the housekeeping aspects of the environmental statement are what concerns me because of the close parallel they bear on my own home situation which I share with many homemakers. I have three teenage sons and a husband who encourages them and shares in all sorts of projects. I think this is wonderful. I admire their ability and ambition to think in broad concepts and anticipate problems and successfully meet the challenge.

The problem then is something like this--it's wonderful you did it, it works, now who's going to clean it up? In my personal milieu this immediately gives rise to dismay, bribery, even coercion. It's kind of a let-down. After the euphoria of great achievement, they have to get down to the boring nitty-gritty of cleaning up afterwards. I don't know. Perhaps a mind that can deal in large concepts and make dreams a reality is simply incapable of focusing down to a probably messy aftermath, and I think that is precisely what has happened to certain too-cheerful objections in the statement.

For instances, there is an impressive hunk of all sorts of

1/ Transcript garbled at this point - other information indicates that this statement was made by Mrs. Jeanne P. Foster.

measurements of the Colorado River and its watershed in the mountain area. But nowhere is there any program for remedial action should all these measurements indicate that a critical point has been reached or passed, nor is there any basic data on which to make comparisons. I don't like this. To me, any program that fails to consider all the factors that can go wrong...I think we need to know whether we have the authority to halt the program should, for example, increased salinity downstream prove detrimental to the crops, and stock, and wildlife. In fact, I'd like to know if there is any consideration of dealing with the situation.

Now, I dare say that should oil shale development prove economically unsound, there'll be little delay in closing the program until a better method or source was found. However, should oil shale development prove ecologically unsound, there is no assurance, no authority to invoke a similar proposal. If the lack of provision is although a serious oversight, not deliberate, then I should be forced to wonder if the Environmental Impact Statement and this hearing too is only an empty gesture--just put on. The statements made here in official hearing are exercises in futility. The decision has already been made to proceed regardless of the adverse discoveries. There are other house-keeping, upkeep problems that bother me. Packed slopes with spent shale are to be protected from hard surface run-off by conduits around them and catch forms below. What agency or company is going to make good these commitments and for how long and at what cost to the public? Should they ever be abandoned, these slopes will easily become subject

to normal erosion processes. After all, that is how those box canyons got there in the first place. It is accepted that spent shale is something like concrete when it is wet down and compacted and let dry, but even concrete has a predictable life span. Are those slopes being maintained until they leave or will nature be allowed to do its worst sometime in the future, long after the program is over? And then will that compacted shale deteriorate in the normal manner of original shale, or at some independently accelerated rate because it isn't the original shale; and that's the point. No one can say because no long-term studies have been made, and so I'm disturbed that we may be leaving a problem to our grandchildren. These scenic bluffs could be set aside as a park or monument, and here we have it nominated as a dumping ground. It sort of makes me wonder about the sense of value that judges the scenic treasures on the basis of being a pat solution for those energy problems. These are just a few of the unknowns in the proposed problem that make a front-time schedule really completely mixed up. Let's set aside our technology and find a way to start to work tomorrow while we can. Now, we're creating some magic for technology. You gentlemen are making a decision that will affect many generations and your decision must be as comprehensive and responsible as you can make them for all of us. Thank you.

MR. DAY: Thank you, Mrs. Foster. Is there anyone else who desires to make a statement? Please come forward.

MISS BOWMAN:1/ Gentlemen, I am Sue Bowman of the Colorado Open Space Council, Mining Workshop.

1/ Transcript garbled - should be Sue Bollman.

STATEMENT OF SUE BOWMAN 1/

The mining workshop is concerned about different aspects of mining, mining procedure, the environment of the area to be mined before and afterwards. We're also concerned about mining safety. Thus far, most of the discussion you have heard here has concerned the environment, economics, and production. But we feel there is another environment that is as crucial if not more so than the other dimensions and it needs more evaluation that's the working practices. The COSC Mining Workshop is quite concerned about the Department of the Interior's attitude toward health and safety for the oil shale miners. Throughout the 1150 pages of the Impact Statement all reference was made towards production and the environment and not one page--not one page--referred specifically to the safety of the miners except to mention that 1100 deaths may occur by 1980. Therefore, many of our questions are unanswered, and we feel some clarification is necessary before any further decision can be made. The room and pillar operations are outlined in a very sketchy form. We'd like to see more complete diagrams containing ventilation systems and the emergency exit portals. This data shouldn't be privileged information because it does concern human life and human health. We are also interested in learning more about the proposed electrical system for both underground and surface operations. What methods of dehumidifying the mine are proposed, and what guarantees are there that this mine will not be over or under dehumidified. Could the noxious gases associated with the room and pillar operation please be identified? Are these gases of an explosive nature? Could they

1/ Transcripts garbled - should be Sue Bollman.

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asphixiate? Are they flammable? What procedures will be used to prevent accumulation? Could the presence of diesel trucks and explosives such as naphtha and dynamite cause the gases to explode? What regulations are there on the amount used and the conditions that are allowable for its usage?

The Impact Statement mentions 1000 tons of dust a day in this underground operation. What kind of dust is it? What is its final causes? What measures will be used to control this dust? How does it compare to coal dust? And has there been any medical testing done to determine if this dust can cause lung diseases similar to tuberculosis or black lung?

The Mining Workshop also feels the roof controls and roof bolting programs should have been included in this statement. What governmental agency approves these plans? Will it be the Bureau of Mines? What plans have been previously tried and proved for oil shale rock? What is the history of roof falls in this operation and how do these falls affect the men as compared to coal mining? Are there more roof falls in this kind of rock? Are the injuries more severe or less severe? What union will these employees be affiliated with? And what state or federal regulations oversee their health and safety? I understand it will be the Metallic Health and Safety Law.

MR. DAY: The Federal Metal and Non-metallic Mine Safety Act of 1969.

MISS BOWMAN: And foremost among our questions, what type of formal training program will be given to all employees--underground,

surface, in situ, processing plant, truck drivers, et cetera? Have these programs been scrutinized by the governing agency, and what special kinds of programs besides those outlined above will be instigated by the agency and by the employers.

According to the Impact Statement:

> "The health and safety statistics are available for both underground and surface mining operations, the technologies involved in oil shale mining and processing make it anticipated to be closely aligned to surface mining in terms of fatalities and accident rates."

Gentlemen, the deep mining is not comparable to surface mining. You cannot compare the statistics of the two methods. Secondly, the oil shale statistics should not be patterned after those of the coal industry. The Bureau of Mines is a production oriented, not a safety oriented agency. The oil shale industry should start out with different standards and priorities than the coal industry, since human life is what takes priority. Therefore, we feel that these questions must be answered before any leasing program is initiated. Thank you.

MR. DAY: Thank you, Mrs. Bowman, anyone else?

STATEMENT OF BOB WEAVER:

MR. WEAVER: I'm Bob Weaver representing the Colorado Council of Trout Unlimited. We have 12 Chapters with over 800 members here in Colorado. Trout Unlimited has not taken a position either for or against future oil shale development in Colorado. T.U. is mostly concerned with problems associated with supplying water for oil shale,

population growth and irrigation for revegitation. We believe that fisheries will be damaged more than the draft environmental statement indicates, especially if the water is supplied by high country water development projects like the Yellow Jacket, West Divide, Rio Blanco, and Sweetbriar.

The Bureau of Reclamation's Yellow Jacket Project is really an old-fashioned backwards method of supplying water for oil shale in the Piceance Basin. High country dams and miles of canals like Yellow Jacket, would seriously damage the entire watershed wildlife habitat which is why the Colorado Wildlife Commissioners passed a resolution two weeks ago opposing Yellow Jacket and similar projects on the White River drainage above Meeker. We suggest that alternatives for providing water be more thoroughly investigated, like taking water out of the streams farther down. For example, take the water out of the White River below Meeker instead of building Yellow Jacket, or provide water by drilling deep water wells. This may cost more money, but that is the cost of protecting the environment.

Furthermore, we question the legal authority of the Bureau of Reclamation to build projects like Yellow Jacket which are primarily for industrial purposes. The Bureau is charged with building projects which are primarily for irrigation, not industry.

If the needs for oil shale are justified and national interest dictates oil shale development, Trout Unlimited asks that it be done in such a way as to minimize watershed damage. We will need more than ever good land-use and water-use planning and safeguards to prevent major environmental damage.

We hope the final environmental statement will provide answers to these questions:

1. How much water will be needed for each use, including the oil shale needs, the minicipal needs and the revegetation needs?

2. Where will the water for each of these needs come from? High or low in the watershed, surface or ground water?

3. What will be the total environmental effects of supplying this water?

Thank you.

MR. DAY: Thank you. Anyone else?

STATEMENT OF CAROLYN R. JOHNSON

MRS. JOHNSON: My name is Carolyn R. Johnson. I am speaking on behalf of the Colorado Open Space Council Mining Workshop and Oil Shale Committee. We are concerned about two broad questions that have not been adequately answered in the Environmental Impact Statement.

Irretrievable Resource Commitment. The draft does not address itself adequately to what will happen if, once initiated, an oil shale industry on the public lands is not economically or environmentally feasible. We need to know what criteria will be used to measure both types of feasibility and the public must have a role in making these determinations.

Oil shale development has been justified as an experimental program leading to a partial solution of the so-called "energy crisis." But any science student can testify that experiments often fail, despite the best efforts of the investigator. We are asked to go along with

an experiment that must not fail, yet what guarantees success?

If shale oil does not fulfill the promise of becoming a partial solution to the so-called "energy crisis," what other specific steps will be taken to achieve the solution, which we are told is vital to our survival as a healthy nation? It is indeed callous to ask citizen approval of an experiment to solve a so-called critical problem and not offer alternatives if the experiment fails. We ask that the final statement honestly assess the potential for failure and the alternatives.

Reclamation Standards. The Mining Workshop has examined leases, stipulations and reclamation results on public and private lands. The oil shale stipulations and their administration and enforcement do not, in our opinion, assure good reclamation in the public interest. To substantiate this we offer the following:

1. The lessee conducts an environmental monitoring program to check on his own compliance with laws and stipulations and to determine conditions which require correction. After the recent Ford Motor Company case of falsifying test data on automobile pollution controls for the Environmental Protection Agency, we are aghast at the proposal that industry can and will regulate itself. We need an independent monitoring program outside the purview of industry.

2. The stipulations contain weasel words and phrases that lessen the environmental protection measures, such as "...are prohibited unless otherwise approved by the Mining Supervisor," "to the extent practicable;" "except as permitted by the Mining Supervisor;" etc.

3. The lessee chooses which revegetation standards he must

meet. This must be an ecologically-based decision, not one at the company's discretion.

4. The stipulations install the Mining Supervisor as omnipotent exercising expertise in at least 20 scientific and engineering fields. He and his staff do not have the capability or expertise to exercise such broad discretionary powers. We feel there should be established a scientific commission, including public representatives, to oversee the environmental protection measures.

Additional comments on these points will be submitted as written testimony.

Congratulations were echoed around this room yesterday. After four years, Interior has delivered itself of a new oil shale baby and this one is the spitting image of the daddy oil companies. The public land pie is being divvied up--and some of the congratulating oil companies are getting; we, the public, are being had.

We are not here to congratulate Interior on a job well done in our public interest. Instead, we'd like to offer our sympathies. Sympathy to those federal employees who are trying to do a conscientious job, but have been steam rollered by the rush-rush schedule of oil shale development. Sympathy to those elected state and federal officials who still cannot realize the shallow boosterism is no longer a ticket to office. Condolences to the public--because if oil shale is developed under the present Interior program--we and future generations will lose the most.

After the hearings yesterday, one of the gentlemen monitoring

these proceedings suggested that he felt the final Environmental Impact Statement needed only to clarify some points in the draft to satisfy the issues raised here yesterday.

Gentlemen, there is no way you can band-aid this final statement to acceptability in the near future. Some of the substantial points raised were these:

1. The basic research on air, wildlife and water, community and sociological implications is not available. This research takes time but must be obtained before the final statement is completed. It is necessary before any further decisions are made.

2. The economic feasibility of oil shale development on public lands must be thoroughly explored and the necessary subsidies made explicit.

3. The environmental impacts of secondary facilities--such as dams, water diversions, power plants, pipelines, roads, etc.--must be considered in depth and at the same time as those of oil shale plants themselves. The test of these is: Would these secondary facilities be built if there were no oil shale development? Or, phrased another way, is oil shale development viable in isolation, without these secondary facilities?

4. Assurances in the draft that Interior and the oil companies will allow only minimal, if any, adverse effects to occur are not sufficient. We have to know what specific technologies and methods will be used and their impacts.

5. A national energy policy is necessary before the public can

approve another major public resource is developed.

Gentlemen, for the last several years we have been trying to send you a message on oil shale and resource development as a whole.

We have been excluded from Interior's decision-making process from the very beginning. We were not allowed to help design an energy policy or an oil shale program within that policy's context. We were shut out of the deliberations on leasing, tract selections, and evaluations. Our requests for authorizing and funding the research as the necessary groundwork before any decision-making could be undertaken were ignored.

The expertise and constructive criticism from within Interior itself has either been ignored, untapped, or shoved aside with the rationale that oil shale development must be kept "on schedule."

Evidently, the lessons of the Alaska Pipeline, Black Mesa, and East Meadow Creek have not been learned yet. We want a healthful environment. We want to be consulted in the decision-making. We want a Governmental climate that nurtures the very best performances from its capable employees. But we have been frustrated in our efforts to attain these very simple goals.

Gentlemen, the pipeline, Black Mesa and East Meadow Creek may have sounded the call-to-arms in the battle for the West.

But we would prefer that they sound the dying retreat--an end to hasty development schedules allowing no time for thorough work; an end to agencies just meeting the legal requirements, but ignoring the spirit of the National Environmental Protection Act; a stop to political

decisions and campaigns determining resource development programs; an end to Government run by bull session.

We offer Interior a challenge: Use your talented people, do the necessary research, be flexible, consult with citizens, propose comprehensive environmental protective programs.

The results could be exciting, innovative, and satisfying.

MR. DAY: Thank you, Mrs. Johnson. Anyone else?

STATEMENT OF V. CRANE WRIGHT

MISS WRIGHT: I would like to thank the Bureau of Land Management and the Department of the Interior for giving us this chance to comment on the draft Environmental Impact Statement on the proposed prototype oil shale leasing program. I would also at this time like to point out that even though COSC has been involved in this project since 1968, this is the first time that the citizens have been allowed to comment publicly. Although there were Senate hearings held in November of 1971, they were closed to everyone except government and private industry.

We would hope that these three-state hearings are only the beginning of open, public hearings to be held throughout the rest of the United States before any final decision is made to develop oil shale public lands. Since these lands belong to all our people, an opportunity to speak and join in the decision-making process would seem necessary.

There is a strong feeling among a large segment of our population that the public has been abandoned. Those very people who should

be speaking on our behalf, who should be the watchdogs of our public lands, who should be passing the laws protecting our public heritage--those very people appear to be in partnership with the exploitative extractors of these, our lands. At a time which calls for fiscal responsibility and the priority of human values over a "fast buck", something seems awry. The campaign dollar is setting our policy and the lobbying dollar, not the taxpayer's dollar, dictates our budget. Behind a banner of "energy crisis" we seem to be saying, "Damn the consequences, full development ahead." There are those of us who believe not so much in the "energy crisis" as in a crisis of permissiveness. We believe we are exploiting our natural resources--not for proven human needs, but for the ever-beefed up advertising demands.

We need our national leaders to speak on our behalf. It is not enough for these leaders to extol us to national unity when at the same time, they polarize our people by turning us into regional chauvinists--Alaskan oil v. offshore drilling v. deep water terminals v. oil shale. We need our leaders' buidance and their initiation of a comprehensive national energy policy. A policy which will put all these sources of energy into perspective and allow us all, as one united people to have a hand in our decisions for the future of energy development.

We need our politicians to set our laws, protect our lands, and guarantee the future of the generations to come. These politicians, we are told, are busy finding the answers to our "energy crisis", but they are not here among us to hear their constituents' questions. They are off playing the game of "trade-offs"--trading our living land

for grey ask, our wildlife for zoo animal oddities, feeding an obsolete monster, the internal combustion engine, with further ribbons of road that necessitate projects like oil shale. We need our loyal public servants--the professional stewards of our public lands, and given the chance, they are loyal.

In this particular instance, we feel strongly that not only are their hands tied, but in many cases their necks are in the noose. Other people have spoken of the social, human impact that this project will have on the communities that will have to suffer the increase in population and all its inherent problems. No one yet has spoken of the torment of a man who is not allowed to do his job, because of pressures exerted above and beyond his control.

(Aside to Stone) Much technical data has already been given, many questions have already been raised. We are today left with the impression that we are not so much being listened to as we are putting in our time to comply with NEPA. I would like to mention two omissions in alternatives which were barely touched on at these hearings.

One, the alternative of doing nothing to these lands--since they are already a viable eco-system that perhaps does not need the manipulation of man's hands.

Two, Mr. Stokes briefly touched on how royally we, as a people, will have to pay for the royalties we are told we are getting. Over a 20-year period we will be receiving approximately $50,000 for the leasing of this land, and a little over this amount in actual royalties. However, the land itself on the open market would bring in, conservatively, over $10,000,000. I propose therefore that the alternative of outright

sale of these lands to industry be considered. After all, what value will these lands have after they have been exploited--gutted?

In closing, I would like to quote from Mr. M. Hubbard King of the Department of the Interior, and one of the world's most foremost petroleum geologists, who had this to say on the development of oil shale.

> "I'd just as soon leave it alone. If you want to imagine one hell of a mess, imagine mining that shale and discharging the salt wastes into the Colorado River. I guarantee you'd kill the river."

For myself, I wish I could be hopeful, could be hopeful that these hearings will have a true impact on the final outcome of this project. I wish that the public could have input into these hearings and be accorded the decision-making right that is given to any of our private landlords. This is not the feeling I am not left with. Rather, I am left with the distinct impression that the Department of the Interior has been ordered to deliver the goods and that we here, at these hearings arejust a whistle stop on the route to an already foregone political conclusion. Thank you.

MR. DAY: Anything further?

(no response)

MR. DAY: If there are no further witnesses, the public hearing will be recessed until 9:30 tomorrow morning at Cheyenne, Wyoming.

Whereupon,

At 10:40 a.m., the hearing in the above-entitled matter was recessed.

CERTIFICATE

The original Court Reporter assigned to this hearing by a commercial reporting service was taken ill and unable to type up her notes, which were in some disarray. A reconstruction of the hearing was undertaken by James Burski and Paula Lowery, who do now certify and attest as follows:

We, the undersigned, James Burski, Legal Clerk, and Paula Lowery, Reporter, do hereby certify that the foregoing is, to the best of our skill and ability, a true and accurate transcript of all the testimony adduced and proceedings had in the hearing in the matter of the Draft Environmental Impact Statement for the Proposed Prototype Oil Shale Leasing Program, held in Denver, Colorado, on October 10 and 11, 1972.

Done in Arlington, Virginia, December 1, 1972.

James Burski

James Burski

Paula Lowery

Paula Lowery

UNITED STATES OF AMERICA

DEPARTMENT OF THE INTERIOR

In the Matter of:

DRAFT ENVIRONMENTAL STATEMENT FOR THE PROTOTYPE OIL SHALE LEASING PROGRAM.

REPORTER'S TRANSCRIPT

Robbers Roost Room
Outlaw Inn Motel
1630 Elk Street
Rock Springs, Wyoming
Tuesday, October 10, 1972

PURSUANT TO NOTICE, the above-entitled matter came on for hearing at the hour of 9:30 o'clock a.m., this date, before DENT D. DALBY, Administrative Law Judge.

PANEL MEMBERS:

HENRY ASH, Oil Shale Field Coordinator, Oil Shale Task Force, Bureau of Land Management, Denver, Colorado.

STEVE UTTER, Bureau of Mines, Denver, Colorado.

HAROLD BOEKER, Bureau of Sport Fisheries and Wildlife, Albuquerque, New Mexico.

JOHN DONNELL, U. S. Geological Survey, Denver, Colorado.

I N D E X

PROCEEDINGS

JUDGE DALBY: This hearing will come to order. My name is Dent D. Dalby. I am with the Office of Hearings and Appeals of the Department of the Interior.

The other members of the panel are Henry Ash, Oil Shale Deputy Coordinator in the Field; Steve Utter of the Bureau of Mines; Harold Boeker, Bureau of Sport Fisheries and Wildlife; John Donnell of the Geological Survey. And that covers the panel. We also have with us Jack Reed of the Bureau of Land Management at the table.

The purpose of this hearing is to receive comments on the Draft of the Environmental Statement of the proposed Prototype Oil Shale Leasing Program, pursuant to Section 102 (2)(c) of the National Environment Policy Act of 1969. In accordance with the provisions of the National Environment Policy Act the Draft Environmental Statement has been made available to the Council of Environmental Quality, and a notice of availability published in the Federal Register of September 7, 1972.

The Office of Hearings and Appeals published a notice of public hearing on the Draft Environmental Statement in the Federal Register of March 7, 1972, scheduling this hearing for today, beginning at 9:30 a.m. Interested parties wishing to appear were advised to contact Director James M. Day, Office of Hearings and Appeals, United States Department

of Interior, 4015 Wilson Boulevard, Arlington, Virginia.

The official Reporter will make a verbatim transcript of the hearing. All matter that is spoken while the hearing is in session will be recorded, and copies of the transcript can be purchased from the Reporter.

Written comments from those unable to attend and from those wishing to supplement their oral presentation at the hearing should be received by the Director, Office of Hearings and Appeals at the previously stated address on or before October 23, 1972, for inclusion in the record.

If the witnesses have prepared a statement, it would be -- we would appreciate furnishing the Reporter a copy for her use in making the transcript.

Now, the first witness I have here listed is Congressman Teno Roncalio. And if you will come forward to the table, Congressmen, and give us your statement, we would appreciate that.

CONGRESSMAN RONCALIO: Thank you very much, Chairman Dalby, members of the hearing. I do not have a prepared statement, and the reason is probably symbolical. I'm not too sure where we've been and where we're going in oil shale. And I'm not sure I could have prepared a statement adding anything of value, either to the expertise that your agency has accumulated over the years, or to the experience that private industry have picked up in the shale research.

I'm here first to commend you for having the

respect for the opinions of the public that we all serve to at least hold a hearing in the field and give the people a chance to be heard. I think this augers well in all energy matters, and wish it could have been done with nuclear stimulation and with other new advanced techniques needed to help solve our energy problems in the country today.

I recall the appropriations in my young life as a staff assistant for the late Senator Joceph C. O'Mahoney of Wyoming for research of oil shale processes, for extracting the oil from the shale, going back 37 years ago, and funds being used at the University of Wyoming Natural Resources Research Institute. I recall how proud the Senator was. He was in many ways my mentor and my political father. He was proud of the research that this government put into Rifle, Colorado, beginning 30 years ago, I think. Certainly a great many years ago.

And there was much disappointment in this man of vision when those processes failed to bring about a way that shale could have taken place earlier than now. He envisioned this sort of thing. He was a man of vision. He pioneered with members of the Department of Interior the Trona Development that is now an industry without which some five or six thousand men would not have jobs in this state.

This was a field close to him and close to his research.

I come more here in memory of him, and I pay tribute to you gentlemen for holding the public meeting.

Environmental protection of the people was not on the books many years ago when the coal began to be strip mined in Wyoming. Yesterday, at Hanna, Wyoming, I was shown the remnants of mining by wild, free entrepenuers of Wyoming, 37 years ago. The first strip mines are ugly, rapacious -- a disgrace to the service of Wyoming. They were committed by leading Laramie, Wyoming, businessmen. We all ought to be ashamed that either businessmen or politicians or public servants would allow conditions like that to continue. Not even the gophers enjoy it, let alone the antelope which are plentiful at this time of year or agriculture or mining, or anything else.

Hanna today, thanks to the United States Bureau of Land Management of the Department of Interior, have leased those miners and required them to reclaim; and the comparison between the mining in Wyoming today on BLM land and on free land or state sections is glaringly obvious. And I commend it to all interested in mining and in our work today to make that comparison today at Hanna. It has been beneficial to the industry; it would be beneficial to the government officials and of great value to members of Congress, no matter who is elected or who is defeated in the final drafting of statutory legislation for strip mining control. That problem is not

separate from your inquiries today in its place in solving the energy problems of this country.

I have glanced through Part II and Part III of the report. I lost Part I. I don't know where it is. I hope you gentlemen can appreciate that I've got other things on my mind in Wyoming the next three weeks, and I'm busy at that which I feel is the people's business.

I come to you from the 92nd Congress where I have been on the job for better than 95% of all the quorum calls, vote calls, and the fifth ranking member in attendance for the Committee in the past two years. This week I'm neglecting Washington to come home and see somebody. For that matter, I no sooner entered this hearing today than two people said to me, "Why can't you come back and see some of your old friends? You are in trouble in your own state."

I'm here attending to that as well as hoping those interested citizens in this part of Wyoming will make their wishes heard.

I am aware that Wyoming will probably rank the least of the states in the potential of the recoverable millions of barrels of oil compared to the basins of Northwestern Colorado and of Northeastern Utah. That production to be done here will be done by in situ recovery methods, many of which have had nothing new added to them in the past decade or two.

I hope that if the experimentation continues that citizens will want to know what's going on will make it their duty to appear before you now and get on record to see what is going on and not wait until good minds of good faith and technicians have decided to proceed on these selected lease sites with experimental methods to then complain about damage to the environment and degredation to the atmosphere.

I repeat now that I have never had categorical opposition to any research programs in Wyoming. I have resented the secrecy with which some of them -- upon which some of them were embarked. Failure to disclose to the public what was going on.

I believe the royalties figures in contract now with the pilots companies is woefully inadequate. In the best public interest. 12 cents per ton for each 30 gallons of oil recovered is a disgrace. And I encourage this panel and all who hear my words to raise that now lest you will be foreclosed forever from doing what is fair and just in the tax policy of this country today.

Citizens private property can no longer absorb the tax for running our government and our various political subdivisions. Serrano versus Priest, California Supreme Court in 1971, has now been followed by at least five additional state supreme courts, ruling that private property -- ruling that it is unconstitutional to tax private property to support

public schools; that this violates the fair and equal clauses of the 14th Amendment because disparities in school districts under tax evaluations.

Where else can we look for the money to run the government if the people's property -- and this shale is the people's property, gentlemen -- doesn't get a fair tax upon those that will profit from its removal. I submit now that an increase in that royalty will hurt no one because no one is there to pay until they do produce. Once they recover, you can trust upon the ingenuity people involved to see that the royalty increase will be paid and taken care of in a good, fair scale of profit.

I think it is almost criminal to allow royalty rates to continue to the horrendous wealth and potential in the shale for helping to solve our energy problems and country today.

Gentlemen, Mr. Dalby, this concludes my testimony. I wish you a successful hearing, and I hope that the -- that if your conclusions are that not enough citizens' response to your hearings this set of them indicates that there has been a sufficient time of notice or opportunity for all to be heard, I hope that you will consider additional hearings with sufficient lead time so that no segment of our economy, no segment of our business, professional people, industrial people, sports and wildlife conservation people can claim

that they did not have an opportunity to come and be heard upon the results of those three documents upon the hearing table this morning. Thank you very much.

JUDGE DALBY: Thank you, Congressman Roncalio. We appreciate your taking your time to give us your views upon the subject.

CONGRESSMAN RONCALIO: I'll be happy to answer any questions.

JUDGE DALBY: Are there any questions?

(No response.)

JUDGE DALBY: Apparently not.

CONGRESSMAN RONCALIO: Thank you very much.

JUDGE DALBY: I understand there was a representative of the Wyoming Game and Fish Commission who was going to testify. Would you come forward, please, to the table? Will you give us your name and your title?

MR. MARKER: Yes. I'm Bruce Marker, and I'm here in the capacity of Environmental Specialist for the Game and Fish Commission of the State of Wyoming.

I'd like to have it known that this statement that I'm about to give has not been reviewed by the entire Commission, because, again, of what Mr. Roncalio pointed out, a lack of time in preparing for this.

However, I have reviewed the Impact Statement that has been sent out, and I'm going to base my statement essentially on what is covered and what is not covered in the Impact Statement.

My official capacity with the Department is to coordinate and review -- review information on impacts as far as fish and wildlife is concerned, inform our Commission and our director as to what it's going to be so they can furnish information to the public which the public can use to make the decision required. So I'm making this statement in the interest of contributing to this process of effective public decision-making relative to the proposed oil shale leasing program in the State of Wyoming. I understand that is the purpose of this meeting.

The Wyoming Game and Fish Department offers the following comments upon review of the Impact Statement. For more clear understanding of the Statement or the statement that I'm about to give, I'd like to offer this.

In the official capacity of our Department we are charged with administering the mandates and policies of the people of the State of Wyoming with respect to wildlife, as stated by law and prescribed by our Commission.

In Section 23-2 of the Game and Fish law of the State of Wyoming, which was revised February 1, 1972, it is declared that all wildlife in Wyoming as defined in Section 2 hereof is hereby declared the property of the State of Wyoming. It is the purpose of this Act and the policy of the State of Wyoming to provide an adequate and flexible system for control, propagation and regulation of all such wildlife. In Section

23-1, Wyoming Game and Fish law, there's a definition of wildlife. It says, "The word wildlife shall be contrued as meaning all wild animals, and birds and fishes within the State of Wyoming."

In Section 23-16 it is stated, "The Commission shall authorize and collect, classify and disseminate such statistics, data, and information as in its discretion will tend to promote the objects and purposes of this Act. The Commission may make such allowances from the Wyoming Game and Fish fund and my utilize state agencies insofar as it may be expedient to carry out the directions of this Section," or this Act.

We've been accused time and again by other agencies or public interests of not taking a stand on a number of -- any number of things that will have an impact on wildlife. And I think that a lot of times this can be attributed to the definition of two words that I'd like to offer here out of context. One of them is coherent and incoherent. It seems that quite often people define coherent as when someone says you want to hear. And opposed, that is incoherent. So if they say something you don't want to hear, that word fits it.

Now, the purpose of this statement -- what I'm going to offer right now, and possibly you may want to stop me because it's written here -- the purpose of this statement, it's to disseminate information as will, within the discretion

of the Commission, promote the objects and purpose of providing for the continuing systems or control, propagation, management and regulations of wildlife within the public decision-making process.

As I see it, we, as professional wildlife managers, are charged to providing a factual accounting of the impact of various alternatives to the proposed project. And you, as members of the public, are to make the decisions as to the selection of alternatives through your selected delegations. I know we have some representatives of the public, but the public is the one who is going to ultimately make the decision as to whether or not this project goes. If it does, what controls will have to be put on it. They will do it eventually through their elected delegation.

I offer the following accounting after having reviewed this Impact Statement, with the feeling that it will render this statement and impact accounting of the project more complete, accurate, and factual. I'm going to start by getting right into the record. On Page I-52 -- which is in the first document -- it is stated that the re-establishment of the fuller range of native browse and cover species may be difficult and time-consuming. It is our hope that this difficulty will not be a deterrent to a continued effort in this direction. A commitment would seem to be in order at this point in the statement that would point -- that would state right in the

statement that the time element in developing lease W-a and W-b -- which are the two proposed leases in Wyoming -- the time element in developing these leases is such that re-establishment of native browse and cover species can be accomplished and will be required within the permit issued to the companies concerned.

On Page I-74 and -75 it states that Colorado has requested interest on Federal, State and local levels to outline a broad course of additional studies for four important areas of environmental concern, commiting three-quarters of a million dollars in two years to this study and perhaps the finding of their study would be applicable to the Wyoming proposal, or perhaps the State of Wyoming should center into a similar program through the existing Environmental Planning Committee, which I know has been set up for the purpose of studying the impact of this program.

On Page II-23 I'd like to suggest that where it says, "or use by Wildlife and Domestic Livestock, or for domestic purposes," -- this be added at the end of Paragraph II, what I've just quoted here, "or use by Wildlife or Domestic Livestock purposes," be added at the end of Paragraph II. This is where it's discussing the effect on the available water supply in the area.

It is stated that -- on Page II-29 -- lists of streams which support high-quality trout in the area is

provided -- in fact, this is provided in the appendix, and it is indicated that they have ommited those stretches of streams that are already destined to be impacted by commited projects, or where permits have already been issued that will have an impact on the streams. And it is essentially said in here that these are omitted from the list of streams that are in the area but are prime trout waters or fishery areas. I would like to suggest that these streams and the total mileage of them that are being impacted be included. The purpose would be to have the eventual tabulation of the total cumulative impact of development on the fish and wildlife resources.

On Page II-40 it was suggested that Section (f) be added. If you haven't read it, they have gone through (e). I would suggest a Section (f) to state, "utilization and enjoyment of open space." should be listed here to the recreational resources. This would be effective, and this would be effective to the degree -- to a great degree by the proposed development. This is something I think not only recreation lists and wildlife people but also sociologists are starting to recognize the value of open space. I think it is time we started counting on the impact statements on proposed developments.

Page II-152 -- all I can say about this is that there needs to be some additional input from the Game and

Fish people to account for the small game populations of the people. I have some statistics here. In our final write-up of this to meet with your requirements, to have our supplemental statement in by the 23rd of October, we will include this.

Here's something -- I don't know how many people noted it or not, but on Page II-159 I noted that within somebody's authority or somebody's perogative, they have moved the county seat of Sweetwater County to Rock Springs. I'm sure the Rock Springs people are happy, but I wonder what the people in Green River feel like.

Page III-21, I think this is a proper place to account for the cumulative impact, including that of related developments of public resources to where we can have an idea of what all of these figures are leading to. And I think this is being pointed out in our state government at this time in that our Governor has indicated in his public addresses lately that he is going to commit the legislative body to passing some sort of environmental act. I think this is some place that we should establish certain people's responsibility for tabulating a total overall impact of future development in Wyoming along with passed developments. Page III-29, Section B, under hunting and angling pressure. This section should be rewritten and structured by individual state projects. You have one statement that covers all of them. I don't believe it does it adequately. I think it has to be applied

to each area individually. Pertinent facts which have to be considered in doing this are, one, jurisdiction and management of wildlife, in putting hunting regulations by individual states. Number two, the same reference quoted in the Impact Statement, which is river basin study -- Type 1 River Basin Study, where the information has been accumulated by the Bureau of Sport Fisheries and Wildlife. It is stated by the year 2000, the quota shows a demand -- they indicate in there through their reasoning that by the year 2000 the demand for hunting and fishing in the total area concerned will not have reached the capacity for the area. This is taken directly from the report.

However, in developing these portions individually by states, the same report shows that by the year 2000 the demand or projected demand for the state of Wyoming would be 178-thousand man days as opposed to a habitat capacity of 172-thousand man days. This leaves a deficiency of six thousand man days in the year 2000 in the State of Wyoming. This does not at the same time account in the report for the loss of habitat within the area due to the development this will have on the impact on the total capacity on this area for use of hunting and fishing.

Number three, current and considered management practices along with relative hunter success, must also enter into any evaluation of comparisons and the terminations of

impact. Number two above, which I just quoted, would in itself render the subsequent reasoning in this section as inaccurate.

Therefore, I submit that these should be accounted for individually by states or by leases. By states, appropriately.

On Page III-83, Table III-16 showing impact of increased population incline rates indicates a need for added enforcement of Game and Fish law and increase personnel to accomplish this requirement. This is not stated in there. It just indicates that they indicate there would be an increase in crime rate. Therefore, we can assume that there's going to be a need for increase in enforcement of Game and Fish law. It will take increase in personnel to accomplish this requirement. To determine the cost of this increase to the Department, it would necessitate determination of the percentage of population -- resident population and non-resident population. Under the present management programs, the increase in pressure on big game would only be in the resident hunters. This is under the current management program. Because we're already issuing a limited number -- we're limiting the number of non-resident permits. There's no way, therefore, that we could increase the number of permits issued to non-residents. Any increase in permanents would come from a resident population. As you know -- all of you who live here -- we have a considerably lesser fee for residents than we do for non-residents. And

whether or not the revenue that the increase in the number of permits issued to residents would be sufficient to cover the increased costs for administration and management of the resource, we don't know as yet because we don't know what the increase would be. We can assume that there is going to be a cost in addition to what the revenue would bring in. However, we do have recodification of the laws for the legislature coming up, and part of the proposal in there is an increase in resident as well as non-resident fees. Perhaps this can take care of it. Again, it will depend on what the total impact will be.

Volume III on Page II-78 and -79, under E, wildlife population densities, as well as current and potential use should be accounted for in the Section. Rare and endangered species should be accounted for separately. They are not adequately accounted for. Where it states on this same page, "No angling habitat exists on the tract," I think to make this more correct the word "angling" should be changed to the word "fisheries."

On Page II-82 under H, Aesthetics, again this would be an appropriate place to account for the value of open space. Open space should be given a positive value with the resulting impact of the proposed project being accounted for. This would be an appropriate place to do that.

On Page V-1, more detailed commitment to mitigation

for unavoidable adverse impact should be accounted for on individual tracts. We're speaking here of the mitigation for the wildlife resource. There are two places in the volumes which each refers to the other, indicating a detailed accounting of proposed mitigation. And if you refer back and forth, you can't find it in either one-- at least I couldn't.

Page IV-45, a table should be included here. It would seem appropriate to include a table here to show the impact of the two leases in Wyoming on the wildlife resource.

Page V-56, Section 4(A). Provision should be made for approval of legally responsible agency. In this case, the law of Wyoming gives the responsibility for fish and wildlife management to the Game and Fish Commission. In this state, in the Draft -- Impact portion of the Draft -- Impact Statement, approval for any regulation or accountability for wildlife is designated to the mining superintendent, and I don't know that whoever he is would want this authority. And if he did have it, I don't know if he would be qualified to carry it out because we do have a legally designated agency and authority in the State to account for this.

Page V-57, Section C, this Section should again be rewritten to provide for all wildlife, not just game species.

Page V-48, under Section (A), I think it would be appropriate to add a part (J) to Section (1). And in this they could account for general stipulations -- or provide

stipulations to provide for mitigations of unavoidable adverse impacts on wildlife resources.

I thank you for this opportunity to comment on the Draft Statement.

JUDGE DALBY: We thank you for being present.

MR. BOEKER: Is it correct to assume that this analysis will be presented as your Commission's formal analysis --

MR. MARKER: Yes.

MR. BOEKER: -- of the Statement?

MR. MARKER: This will be submitted to the Commission for approval, and I have no reason to suspect that they won't approve it, but this is within their authority, to approve or disapprove this. And in the event that they do, it will be forwarded by your deadline date under the signature of your Director or the President of the Commission, whoever they elect to authorize this.

But the purpose of presenting it here was to assist in providing information to the public.

JUDGE DALBY: Any other questions?

(No response.)

JUDGE DALBY: Thank you. Are there any other witnesses present or people who wish to testify? Come forward; will you state your name and affiliation?

MR. LOOMIS: My name is Marion E. Loomis, Mineral Development Geologist, Wyoming Department of Economic Planning

and Development.

Our agency is preparing a detailed written statement on the Draft Environmental Statement for the proposed prototype oil shale leasing program which will be submitted to the U. S. Department of Interior by October 23, 1972.

The Department of Economic Planning and Development is concerned with the overall impact of any general development in the State of Wyoming. A development of the scale of the proposed prototype oil shale leasing program will bring about substantial changes in the area of development and will affect the rest of the state to some extent.

We feel that the oil shale leasing program, as described in the Draft Environmental Statement, will provide our agency and other state agencies an opportunity to work with private industry, local citizens, and the Department of Interior to bring about an orderly development of any oil shale program that may result from the prototype leasing program.

The overall affects of the development of a 50-thousand-barrel per day shale oil industry in Wyoming are to some extent unknown. Certain basic conditions are known, such as the need for access roads, water supply and utilities. Other items, such as the total amount of land disturbed, will not be known until the type of mining and processing have been determined.

A typical problem in the Washakie Basin is water supply. If the development of oil shale were to damage the limited water supply, the use of the area for stock and wildlife would be seriously restricted. If the oil shale industry were to develop additional water supply, the use of this area for stock and wildlife could be enhanced.

The only means of realistically evaluating the impact of the development of an oil shale industry in the Wyoming Washakie Basin is to proceed with the program as proposed in the Draft Environmental Statement. This would provide an opportunity to study the real problems and the real benefits of such a development.

I also have a statement from Doctor Miller of the Wyoming Geological Survey, State Geologist.

"Having participated in the original planning for a prototype oil shale leasing program in Wyoming, and having reviewed Volumes I through III of the Department of Interior's Draft Environmental Statement on the same subject, it is evident that Interior should proceed to prepare Final Environmental Statement in order that an oil shale leasing program can be established as soon as possible."

Thank you.

JUDGE DALBY: Any other statements?

MR. PATTON: Senator Hansen has asked that I extend his apologies for being unable to attend. He would testify

before the hearing on October 12 in Cheyenne and would have a written statement.

JUDGE DALBY: Would you give us your name?

MR. PATTON: My name is Patton.

JUDGE DALBY: Would you come forward and give us your name and affiliation?

REPRESENTATIVE MAJHANOVICH: I'm Steve Majhanovich, Sweetwater County.

Any environmental impact statement, of course, should be concerned with the long-range or short-range affects of the energy crisis that is impending in the United States today. With five percent of the world's population, we're a consuming 40 percent of its resources. The oil shale development certainly should be part of the coordinated effort by the Federal Government, by your state governments in conjunction with nuclear stimulation, synthetic natural gas, liquified gas, and other hydrocarbon resources.

When we think of an environmental impact, particularly in the impact of oil shale, we must consider the energy needs of the United States and, of course, on a local basis the energy needs of Wyoming.

I will point out to you that within the past two or three years there have been an industrial uproar because of the lack or shortage of natural gas in Southwestern Wyoming for industrial use. At a recent meeting in Casper, Wyoming,

of the Rock Mountain Oil and Gas Association, some dealers were actually complaining about a shortage of diesal oil in the State of Wyoming. People from the Denver, Colorado, region experienced three days of a gasoline shortage over the Labor Day weekend.

When you consider the environment -- the impact of the program on the environment, you must also consider the potential energy needs of the United States and the State of Wyoming. So I'm going to direct just a general statement on the impending shortage of natural hydrocarbons in the United States.

I feel that immediate development of our shale oil resources should commence. Development should be of a short-range nature because of the adverse affects of waste shale removal if this retorting is used.

Development of oil shale should be a second priority. Some environmental safeguards may have to be dropped in view of the potential energy crisis in the United States, but I believe that those problems can be taken care of if the project extends beyond the point where a more careful allocation and use of our limited resources have been made.

In other words, until such time as breeder reactors, solar energy, direct conversion of coal into hydrocarbons, or other energy sources are developed, development of oil shale should be an immediate number one priority on a short-term

basis.

A long-range plan of development may, in my opinion, extend more energy to develop, produce and dispose of the spent shale, than the actual energy released.

Although I hesitate in a free enterprise system to dictate where the end products should be used, it is becoming more apparent that the wasteful practices of preceding generations and this generation are responsible for the energy crisis we are now approaching,and the continuous wasteful demand for new energy cannot but assist in the gradual decay of our environment.

Development of oil shale should be part of a national policy on all fuels. I believe we can have our cake and it it, insofar as the environment is concerned, in a well-conceived, sound coordinated policy of total energy resources today.

Thank you.

JUDGE DALBY: Thank you. Any questions?

(No response.)

JUDGE DALBY: We thank you, Mr. Majhanovich, very much.

Are there any other people who wish to testify?

(No response.)

JUDGE DALBY: Apparently not. And I want to say, the Director of the Office of Hearings and Appeals has asked

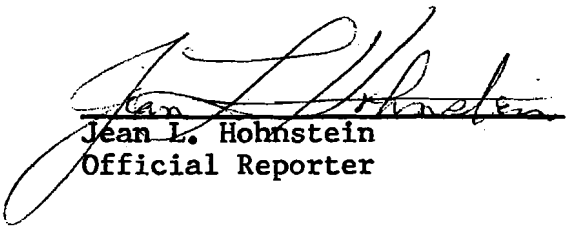
me to express his personal thanks for your attendance and the time and effort. The comments will be of value to the Department and all of the comments will be carefully considered in accordance with the applicable provisions of the National Environmental Policy Act of 1969.

And if there is nothing further, I think we can adjourn. Thank you very much.

(Whereupon, at 10:30 o'clock a.m., the hearing in the above-entitled matter was adjourned.)

REPORTER'S CERTIFICATE

This is to certify that the attached proceedings before the Department of the Interior in the matter of: DRAFT ENVIRONMENTAL STATEMENT FOR THE PROTOTYPE OIL SHALE LEASING PROGRAM, at Rock Springs, Wyoming, Tuesday, October 10, 1972, was held as herein appears, and that this is the original transcript thereof for the file of the Department.



Jean L. Hohnstein
Official Reporter

UNITED STATES

DEPARTMENT OF THE INTERIOR

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In the Matter of:

COMMENTS ON THE DRAFT ENVIRONMENTAL STATEMENT FOR THE PROPOSED PROTOTYPE OIL SHALE LEASING PROGRAM

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American Room
Little America Motel
West Lincoln Way
Cheyenne, Wyoming

The above-entitled matter came on for hearing at 9:30 a.m., Thursday, October 12, 1972,

BEFORE:

JAMES M. DAY, Director, Office of Hearings and Appeals, U. S. Department of the Interior, Washington, D. C.

PANEL MEMBERS:

REID STONE, Oil Shale Coordinator;
ANDREW DeCORA, Bureau of Mines;
ALBERT LEONARD, Bureau of Land Management;
KEN ROBERTS, Bureau of Sport Fisheries and Wildlife.

I N D E X

P R O C E E D I N G S

MR. DAY: This hearing will come to order. My name is James M. Day and I am Director of the Office of Hearings and Appeals, United States Department of the Interior.

Sitting on the panel as representatives of the Department are Mr. Reid Stone, Oil Shale Coordinator; Mr. Andrew DeCora, Bureau of Mines, Albert Leonard, Bureau of Land Management; and Mr. Kenneth Roberts, Bureau of Sports Fisheries and Wildlife.

The purpose of this hearing is to receive comments on the Draft Environmental Statement for the Proposed Prototype Oil Shale Leasing Program, pursuant to Section 102(2)(C) of the National Environmental Policy Act of 1969.

In accordance with provisions of the National Environmental Policy Act, the draft environmental statement was made available to the Council on Environmental Quality on September 6, 1972, and a Notice of Availability published in the Federal Register on September 7, 1972. This document has been marked as Exhibit 1.

The Office of Hearings and Appeals published a Notice of Public Hearing on the draft environmental statement in the Federal Register on September 7, 1972, scheduling the hearing for today, beginning at 9:30 a.m. Interested parties wishing to appear were advised to contact Director, James M. Day, Office of Hearings and Appeals, U. S.

Department of the Interior, 4015 Wilson Boulevard, Arlington, Virginia, 22203.

An official reporter will make a verbatim transcript of the hearing. All matter that is spoken while the hearing is in session will be recorded by the reporter. In order to insure a complete and accurate record of the hearing, it is absolutely necessary that only one person speak at one time.

While the hearing is in session, no one will be recognized to speak other than the parties who wish to present statements.

It should be understood that this is not an adversary proceeding. The participants presenting their views will not be sworn or placed under oath. There will be no examination or interrogation of any of the participants. However, the panel may ask witnesses questions in order to clarify matters brought out in the testimony.

The participants will be called in the order shown on the list available at the press table.

Although there will be no strict procedural rules, I would like to stress two important points. The first is that the presentations should be relevant and supported by pertinent data. If any comment is directed to the draft environmental statement, please refer to the applicable pages of that statement, and if information is quoted from technical or scientific journals or other publications,

please give the name, author, page number and date of the publication.

Participants may submit written statements at the conclusion of their oral presentations. The statements will be marked as exhibits. I do not, however, wish to receive written statements as exhibits unless they contain material that has not been covered in the oral presentation.

It will be quite helpful to the reporter if we could obtain copies of any prepared statements. Accordingly, the participants will be contacted as they approach the speaker's table to see if copies of their presentation are available. Any such statements will not, however, become a part of the record unless a specific request is made and unless it contains material that is not covered in the oral presentation.

It will be quite helpful to the reporter if we could obtain copies of any prepared statements. Accordingly, the participants will be contacted as they approach the speaker's table to see if copies of their presentation are available. Any such statements will not, however, become a part of the record unless a specific request is made and unless it contains material that is not covered in the oral presentation.

Oral statements at the hearing will be limited to a period of 10 minutes. This limitation will be strictly

enforced. To the extent that time is available after presentation of oral statements by those who have given advance notice, I will give others present an opportunity to be heard.

Written comments from those unable to attend, and from those wishing to supplement their oral presentation at the hearing, should be received by the Director, Office of Hearings and Appeals, at the address previously stated, on or before October 23, 1972, for inclusion in the record.

A transcript of this public hearing will be prepared and the final environmental statement will reflect the comments of this hearing where appropriate.

Copies of the transcript of this hearing can be obtained by making arrangements with the official reporter. Copies of all written statements can be obtained by making appropriate arrangements with the Director, Office of Hearings and Appeals.

The Secretary of the Interior, Rogers C. B. Morton, has asked me to express his personal thanks for the time and effort contributed by all of the participants in this meeting. The comments and opinions received will be of valuable assistance to the Department. All comments will be carefully considered in accordance with applicable provisions of the National Environmental Policy Act of 1969.

I now call on the Governor of the State of Wyoming,

Stanley K. Hathaway.

GOVERNOR HATHAWAY: Thank you, Mr. Chairman. Members of the Hearing Board, first of all, let me welcome you to the Capitol City of Wyoming. I understand you are going to Rock Springs when you leave here. The only error I saw in the Environmental Report was that Rock Springs was the county seat of Sweet Water County. It happens to be Green River. I am sure you will correct that when you get over there.

The research and development of Wyoming's large oil shale deposits has been a subject of major concern to the State of Wyoming for many years.

In July, 1968, I appointed the Wyoming Oil Shale Advisory Committee to examine the Department of Interior's report "Prospects for Oil Shale Development--Colorado, Utah and Wyoming" dated May, 1968.

The Wyoming Oil Shale Advisory Committee members submitted their comments to me and I in turn submitted a detailed statement to the Secretary of Interior.

Again, in May, 1970, at the request of the Department of Interior, I formed the "Wyoming Oil Shale Environmental Planning Committee." This committee examined all available information on Wyoming oil shale and prepared the report "Environmental and Economic Report on Wyoming Oil Shale" which was submitted to the Secretary of Interior in

February, 1971.

I am pleased to see that the Department of Interior's Proposed Prototype Oil Shale Leasing Program has incorporated a number of the suggestions and recommendations of these two Wyoming committees.

The Wyoming Oil Shale Environmental Planning Committee is still an active committee and is ready and willing to work with the federal government, private industry and other interested groups in the orderly development of an oil shale industry in Wyoming.

It is common knowledge that the United States has a serious energy problem and in order to meet the energy needs of this country all potential sources of energy must be evaluated. The true nature of this energy shortage was brought out recently by the critical short supply of gasoline which occurred in the Denver, Colorado area over last Labor Day weekend. As stated in the Draft Environmental Statement, oil shale in Colorado, Utah and Wyoming has the potential to supply one-million barrels of oil per day by 1985 or 10 percent of the projected domestic supply of the crude petroleum at that time. Any source of supply that can fulfill 10 percent of the annual domestic production by 1985 certainly must be developed.

There are many aspects of oil shale development which are in question today. The best method of mining,

surface, underground, or in situ, the true environmental problems, the socio-economic impacts, etc. Many studies and projections have been made and recommendations range from full-scale development to no development at all of these rich oil shale deposits.

The Proposed Prototype Oil Shale Leasing Program and subsequent development appear to offer a logical process by which government, industry and interested citizen groups can work together in the orderly development of a pilot program in which all various aspects of oil shale development can be examined and realistic solutions can be developed.

In fact, the proposed oil shale leasing program offers the United States and the States of Colorado, Utah and Wyoming a unique opportunity to prove that we do have the ability to develop a major source of energy without undue damage to the environment of this area that we all dearly love.

We need to develop and refine the technology necessary to produce oil from our oil shale deposits in the most economical manner. This cannot be done without issuing developmental leases on a basis that private industry will invest the necessary capital. At the same time I believe it is impossible to evaluate all of the environmental consequences of oil shale mining and production without

on-site projects which demonstrate the necessary guidelines for environmental protection. Simply stated, we need to have a developmental project in each of the three states of Wyoming, Colorado and Utah to improve our technology and to show in a practical way the environmental protection measures that will be necessary prior to commercial production. I believe that the time for commencing these developmental projects is now.

As Governor of Wyoming, I appreciate the fact that the Department of Interior held these hearings in Wyoming in order to provide our people an opportunity to express their opinion of this proposed program. Additional written statements will be submitted to the United States Department of Interior on the Draft Environmental Statement by the State Department of Economic Planning and Development and the Wyoming Oil Shale Environmental Planning Committee.

The State of Wyoming, incidentally, has about 260 acres of State land within the area of the Oil Shale Deposits in Southeastern Wyoming. The Land Commission has taken the position that we will develop a State leasing policy in conjunction with the Federal Government as soon as we know what the Federal Government's policy is going to be. The oil shale projects in Wyoming are of a different nature than those in the Peance Creek Basin. They are thinner, but also perhaps more readily lined without the tremendous

over-burden. We think it is important today that there will be a developmental project in each of these states because the problems are different and we hope that the incentive will be great enough to private industry to have a project in each of the three states.

I believe that the Department has done a fine job of evaluating the environmental consequences, but what do we really know until we actually have a project on the ground, until we can evaluate over a period of five or six years, what happens when we start mining oil shale. We have talked about this project in the last three administrations. Wyoming has always taken the position that we should move forward and we hope that we have now reached the point that we are going to move forward and not continue to study and talk about this problem for the next ten years, because the energy shortage is so critical that these resources must be developed. I believe they can be developed in a way that not only benefits the National interest but protects the environment of this great area. Thank you, very much, gentlemen.

MR. DAY: Thank you, Governor. I now call on Mr. William J. Thompson, representing Clifford P. Hansen, United States Senator from Wyoming.

MR. THOMPSON: Mr. Chairman, first I would like to state that Senator Hansen had hoped to be here personally

today but the closing and hectic final days of the Congress kept him in Washington. However, when he first went to Washington in 1967, he started developing oil shale legislation which he introduced in 1968. His absence should, in no way, reflect a disinterest in this matter. In fact, he is delighted that at long last it appears that we are on the verge of actually developing these resources.

Mr. Chairman, let me compliment you for holding open hearings on the proposed oil shale leasing program in Wyoming.

I know that many long and tedious hours and the best efforts of those who are knowledgeable of the oil shale program have gone into the preparation of the draft environmental statement on the environmental costs and problems of oil shale development.

The State of Wyoming under Governor Hathaway's direction has also made a comprehensive study of the environmental impact of oil shale development which, I am sure, was used in the Department's study and statement.

The conclusion of the draft environmental statement is encouraging both to those of us concerned with the quality of the Wyoming environment and to those of us who also must be concerned with the nation's energy needs.

There can certainly no longer be any doubt that the nation does face an energy crisis. U. S. self-sufficiency in

oil and gas has already disappeared and we are importing more than 25 percent of the oil we use and are using much more gas than is being discovered each year. Oil and gas together furnish three-fourths of our total energy needs and we are pursuing a perilous course in a growing dependence on imported oil and gas, most of which must come from the Eastern Hemisphere Arab countries, not the most politically stable are of the world.

The Department of the Interior is actively involved in a White House study of the energy problem and possible solutions. The Senate Interior Committee is in its second year of a study on National fuels and energy policy which included oil shale hearings. In the short term -- for the next 15 years at least -- the U. S. must depend mainly on petroleum hydrocarbons to meet the bulk of our escalating energy needs.

We face a real threat to this country's status as a world power resulting from increased dependence on foreign oil. This problem, of course, will only be solved when our nation is again in substantial control of its energy supply, and this may not happen again until after 1985, at the earliest. But there is much we can do, first to mitigate our dependence on foreign oil in the short-term, and second to lay the foundations now for a future viable energy position.

In the short term, we can take at least three steps:

We can begin construction of the trans-Alaska pipeline, which the Secretary of the Interior has approved on the basis of three years' exhaustive study. We can decontrol the wellhead price of natural gas. We can intensify both offshore and onshore drilling.

In the long term there are three other fuel sources which must be developed and on which we must begin taking action now. These are oil shale, coal and nuclear power.

Coal is a major U. S. resource which could provide us with ample energy supplies. But it failed to develop significantly in the Sixties for several reasons including over-optimistic nuclear forecasts, stringent safety regulations, and sulfur restrictions. In 1972, air quality standards are still effectively barring large volumes of high-sulfur coal from the market, particularly from use in power plants which have turned to residual fuel oil. In the absence of economical stack gas control, it would therefore seem important that we exercise caution in setting sulfur-control standards. The expanded use of low-sulfur coal from the Western states is particularly a possibility if we are realistic about pollution levels.

Exploitation of coal reserves for conversion to liquid or gasified fuels will, of course, require the creation of a new large-scale industry, necessarily a long-term

proposition. The Department of the Interior has, in fact, recently broken ground for a coal gasification pilot plant in Pennsylvania, and others are being funded by the American Gas Association and the Office of Coal Research.

But I believe development of an oil shale industry that could contribute substantially to U. S. self-sufficiency in energy by 1985 offers one of the best alternatives we have at the least cost to degradation of the environment. There are and will be problems including the water that will be needed as the draft environmental statement points out. By comparison, one large coal liquification plant would require almost twice as much water.

Another problem would be increased salinity of the Colorado River. We are not attempting to solve that problem through Federal legislation in cooperation with the Colorado River states.

I am impressed with the draft statement's consideration of alternatives. And I certainly agree that the environmental problems facing the alternatives are as great or greater for other domestic sources as they are for oil shale.

And I also agree with Assistant Interior Secretary Hollis Dole, who, in my opinion, is one of the nation's most knowledgeable men in energy matters.

Secretary Dole has testified before the Senate

Interior Committee that he believes it is now economical to develop oil from oil shale providing the environmental safeguards are met.

In oil shale we have a tremendous reserve of energy -- far greater than any other known domestic source except possibly coal -- and I believe it should be developed to assure both economic and national security.

When the U. S. becomes substantially dependent on imported oil along with a growing dependence on imported liquified natural gas, already three times the price of domestic gas, we will undoubtedly see a rapid rise in the price of oil.

Oil from shale will probably be higher than the present wellhead price of domestic crude oil but could very well be the price regulator of imported oil.

I believe that development of a one million-barrel-a-day shale oil industry by 1985 would come closer than any other domestic alternative in solving America's near and long-term energy problem without unduly degrading the environment.

MR. DAY: Thank you, Mr. Thompson. We will next call on V. Dean Allred, who will make a statement on behalf of Marathon Oil Company.

MR. ALLRED: Mr. Chairman and members of the panel, it is my pleasure this morning to present a statement

in behalf of G. R. Schoonmaker, Vice-President for Exploration for the Marathon Oil Company.

This Program is being proposed in consonance with the President's Clean Energy Message of June 4, 1971, wherein he requested the initiation of "a leasing program to develop our vast oil shale resources, provided that environmental questions can be satisfactorily resolved."

The development of all domestic energy supplies is needed to fulfill the following apparent national goals:

(1) Adequate energy for continued economic advancement.

(2) An acceptable level of reliance on foreign energy sources.

Those two objectives should be met with a rational consideration among the factors of environment, economics, and dependability of supplies for the consumer.

The National Petroleum Council in the interim report of July, 1971, U. S. Energy Outlook: An Initial Appraisal 1971-1985 points out that unless substantial improvements occur in economic conditions and government policies, this Nation will be dependent upon foreign sources for 57 percent of its oil requirements by 1985. The bulk of this foreign oil would have to come from the Middle East and North Africa.

It is questionable whether this Nation is capable of maintaining its economic and diplomatic initiative under such a degree of energy dependence.

Given these considerations, we laud the proposed Oil Shale Program which provides a reasonable approach to test the viability of this energy source.

We must not lose sight of the fact that the proposed Oil Shale Program is being undertaken to test the following premises: (1) The economic and technical feasibility of mining and conversion of the oil shale to a useable synthetic liquid or gaseous hydrocarbon. (2) The adequacy of the proposed bidding and leasing policy. (3) The impact of the proposed mining and conversion systems on the environment.

We would, particularly, like to comment on the last item. It must be emphasized that this Program is a prototype, in which a very small amount of land has been carefully chosen in order to quantify certain unknown factors. The entire rationale behind the proposals is to take these six tracts, which are representative of various potential recovery techniques, and test oil shale technology and environmental effects. Therefore, the Interior Department has reduced the amount of acreage to an absolute minimum and dispersed that amount over the vast expanse of three states in order to truly test the Program in a microcosm. This is an example of long-range planning and a scientific approach to a balanced solution for unlocking the oil shale resources.

We firmly believe that the operations under the

prescribed conditions on limited acreage are capable of being conducted with minimal long-term effect on the environment. Even more to the point, we feel that it would be a major error to abort the potential development of this new and vital industry by premature condemnation of a program designed to develop and perfect technology and to ascertain the vital environmental data. All this information will be important in developing the vast oil shale resources so that they may become part of the reserves and production so sorely needed in helping to meet our Nation's energy requirements.

The lead time required in the shift of all forms of energy from resource to reserve and production categories is always great but it will be particularly long in oil shale since new technology and methods must be developed. Any commercial production resulting from the Prototype Oil Shale Leasing Program is at least seven to ten years into the future and therefore we urge that the sale be held at the earliest possible date. It can be anticipated that additional leasing of Federal oil shale lands will probably await the results of these initial efforts; hence, the deferral of the sale under this Program will postpone the entrance of an oil shale industry into our energy supply picture further into the future, a delay which definitely will not be in the best interest of our Nation. Very truly yours, G. R. Schoonmaker, Vice-President, Exploration.

MR. DAY: Thank you, Mr. Allred. We will now call on a representative from Cameron Engineers, Denver, Colorado.

MR. HAND: Mr. Chairman, my name is John Hand. I am Vice-President of Mintech Corporation. Our parent firm, Cameron Engineers of Denver, of which I also am Vice-President, has been a consultant to companies with oil shale interests for nearly 20 years. Some of our people have experience in oil shale dating back to the mid-1940's when the Bureau of Mine's oil shale research facility near Rifle, Colorado was opened.

Mintech Corporation has been actively engaged for the past few years in exploring and studying the potentials of oil shales in the Green River Basin of Wyoming for in situ production possibilities. We are following closely the work and cooperating wherever possible with the program of the U. S. Bureau of Mines being carried on by the Laramie Energy Research Center.

The research that the Bureau of Mines is doing at Green River and north of Rock Springs, Wyoming with conventional fracturing methods in the Wyoming oil shales has shown considerable promise and we hope that this program can be accelerated. The oil shales of Wyoming, although not as geographically concentrated as in Colorado and Utah, appear to be uniquely favorable in their characteristics for in situ retorting methods.

The development of feasible methods for in situ retorting is going to take time and money but the target is very big and the work should be encouraged. We would hope that in the event there is insufficient interest shown in leasing sites which could only be developed by in situ methods at this time, then the Department of the Interior consider reoffering these or other sites which might be nominated by industry when the state of technological development is further advanced.

Now turning to the Draft Environmental Statement, the Department of the Interior is to be commended for compiling one of the most thorough impact statements ever prepared. Not only has the Department predicted the environmental impacts of the proposed prorotype leasing program, which in itself is a relatively modest program, but the Department has provided a glimpse of what could conceivably be the end result of the current program at a point several years into the future. In doing so, the impacts caused by development on private lands, as well as on public lands, have been considered.

That portion of the statement dealing with energy alternatives is especially well done. The data presented confirm the conclusions reached in numerous energy studies conducted over the past several years by groups such as the National Petroleum Council, the Interior Department and the

Office of Emergency Preparedness. The fact is well documented that this nation is approaching an era of energy shortage. The longevity of that era depends on the energy policy decisions made today.

No single source can supply 100 percent of our energy needs and for that reason, it is imperative that steps be taken to develop alternative sources. In the interim, heavy reliance must necessarily be placed on conventional petroleum because of the several years of lead time required to develop viable alternatives. Oil shale is but one fuel that will become part of a broadened energy mix in the future, a mix that will likely include liquid and gaseous fuels from coal, and increased usage of nuclear fuels.

Reduction of energy consumption is discussed in the statement as one alternative to shale oil production but the social and economic consequences of this approach are considered to be dangerous, if in fact a reduction in energy consumption could be achieved. Whereas U. S. per capita energy consumption might conceivably reach a plateau sometime in the future, total energy consumption by this nation will most assuredly increase.

Increased imports of petroleum from foreign sources is called by many the only answer to our energy problems, but the relative insecurity of supply from many countries makes it undesirable to increase our dependence on these

sources. And the worldwide demand for petroleum is increasing. Per capita consumption in developing countries is rising even faster than in the United States. International competition will grow even more intense in the future further strengthening the position that we in the U. S. should improve our energy self sufficiency. Shale oil will be part of the solution.

Neither the Department of the Interior nor industry is approaching oil shale development oblivious to concern for the environment. As a matter of fact, the record shows exactly the opposite. We recognize the unique opportunity to create an industry that will include environmental quality controls from the very beginning. No other American industry has ever had that opportunity. Industry does not intend to lose the opportunity nor do we intend to shirk the responsibility that is incumbent with us to protect the environment. Considerable sums of money have already been spent for research aimed at providing solutions to environmental problems, and much more will be spent before the first barrel of shale oil enters a pipeline.

The prototype program is designed to not only insure that environmental impacts will be minimized, but to provide the means by which development can be stopped if adequate pollution control cannot be achieved.

Let us trace the steps that will be taken to insure

that environmental impacts are controlled within acceptable limits.

1. A company bidding on a tract must present with its bid a preliminary plan describing the type of development envisioned to be most suitable for the tract in question and they must define the steps that would be taken before choosing the ultimate development plan.

2. Each lease issued will contain stipulations specifically tailored to individual tracts -- stipulations defining what can and cannot be done on that tract and what must be done to protect the environment. The stipulations would be toughened in the future if the necessity for doing so became obvious. The stipulations would supplement state and Federal air and water quality standards. Development would also be subject to Federal regulations dealing with exploration, production, mining and reclamation of lands administered by the Interior Department. Also to be made part of a lease are specific stipulations for each tract to control the use and reclamation of any off-tract lands used for pipelines, roads, power lines, disposal sites, etc. Use of these other lands must also conform to the Federal and state standards and regulations mentioned earlier. In addition any lease would include language designed to encourage timely and orderly development of oil shale and to discourage speculation.

3. After a lease is issued, a lessee is required to initiate extensive monitoring programs to determine if environmental protection measures are adequate or if changes are required. Such monitoring would be required throughout the life of the lease and would include surveillance of wildlife and its habitat and air and water quality.

4. Within three years of a lease issuance, a lessee would be required to submit a detailed plan of development to the Interior Department. Only after public hearings and consultation with state and local officials would the plan be approved, and only then after necessary changes had been made. If the plan, as submitted, were toally unacceptable to Interior, it would be reworked. And it would continue to be reworked until it was acceptable. Large scale development would not occur until solid guarantees of environmental protection were provided.

5. If the lands for which leases were issued during this prototype program could not be developed in a manner consistent with environmental integrity, no development would occur and no further leases would be issued until environmental protection could be assured.

Thus, the safeguards built into the program clearly indicate that oil shale development will be done right or it won't be done at all. If air and water quality cannot be maintained within acceptable limits, there will be no

development. If land affected by mining or waste disposal cannot be satisfactorially reclaimed, there will be no development. If the companies obtaining leases don't cooperate fully with local and state officials charged with the responsibility of planning the municipal facilities required, there will be no development. If adequate provisions cannot be made for protecting fish and wildlife and for protecting and/or restoring their habitats, there will be no development.

And contrary to the historical belief that a man's home is his castle, to do with as he wishes, companies developing private lands will be obliged to adopt essentially the same rigid standards that will legally be required of development on public lands. We strongly endorse the safeguards built into the leasing program and feel that the stringent rules, regulations, and stipulations do not affect industry's willingness to cooperate and participate.

Gentlemen, the need for shale oil has been amply demonstrated not only by the draft environmental statement, but by literally dozens of energy studies in the past several years.

The draft statement is thorough in its identification of impacts but most importantly, it describes effective procedures by which those impacts would be minimized. There is no doubt in our minds that oil shale

can be developed safely and efficiently by private industry. But because of the time lag between conception of a plan and actual commercial production of shale oil, it should not be postponed any longer. To do so only invites a crash program of development which could lead to far more serious environmental impacts.

We urge you to proceed with the program as defined in the draft statement.

MR. DAY: Thank you, Mr. Hand. This completes our list of scheduled witnesses. Are there any others present desiring to make a statement? Hearing no response on behalf of the panel, I would like to thank the people of the State of Wyoming for their warm hospitality and this hearing is recessed until tomorrow morning at 9:30 in Salt Lake City, Utah. Thank you.

(Whereupon, at 10:20 a.m., the hearing was recessed.)

"This is to certify that the attached proceedings before the Department of the Interior in the matter of the Oil Shale Leasing Program, Cheyenne, Wyoming, October 12, 1972, were held as herein appears, and that this is the original transcript thereof for the files of the Department.

James P. Ford, Official Reporter
FEDERAL REPORTING SERVICE
991 URSULA STREET
DENVER, COLORADO 80011

UNITED STATES OF AMERICA

DEPARTMENT OF THE INTERIOR

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In the Matter of:

DRAFT ENVIRONMENTAL STATEMENT FOR THE PROTOTYPE OIL SHALE LEASING PROGRAM.

REPORTER'S TRANSCRIPT

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Auditorium
Vernal Junior High School
721 West First South
Vernal, Utah
Thursday, October 12, 1972

PURSUANT TO NOTICE, the above-entitled matter came on for hearing at the hour of 9:30 o'clock a.m., this date, before DENT D. DALBY, Administrative Law Judge.

PANEL MEMBERS:

HENRY ASH, Oil Shale Field Coordinator, Bureau of Land Management, Denver, Colorado.

STEVE UTTER, Bureau of Mines, Denver, Colorado.

HAROLD BOEKER, Bureau of Sport Fisheries and Wildlife, Albuquerque, New Mexico.

JOHN DONNELL, U. S. Geological Survey, Denver, Colorado.

I N D E X

P R O C E E D I N G S

JUDGE DALBY: The hearing will come to order. My name is Dent D. Dalby; I'm with the Office of Hearings and Appeals under the Department of the Interior and have been asked to conduct this hearing.

With me on the panel are Henry Ash, Bureau of Land Management; Steve Utter, the Bureau of Mines; Harold Boeker, Bureau of Sports Fisheries and Wildlife; and John Donnell of the Geological Survey.

The purpose of this hearing is to receive comments on the Draft Environmental Statement for the Proposed Prototype Oil Shale Leasing Program, pursuant to Section 102 of the National Environmental Policy Act of 1969.

In accordance with provisions of the National Environmental Policy Act, the Draft Environmental Statement was made available to the Council on Environmental Quality on September 6, 1972, and a notice of availability published in the Federal Register on September 7, 1972.

The Office of Hearings and Appeals published a notice of public hearing on the Draft Environmental Statement in the Federal Register on September 7, 1972, scheduling the hearing for today, beginning at 9:30 a.m. Interested parties wishing to appear were advised to contact the Director, James M. Day, Office of Hearings and Appeals.

Participants may submit written statements at the

conclusion of their oral presentation. The statement will be marked as an exhibit. However, I don't wish to receive written statements unless they contain materials that are not presented in the oral statement here.

It will be helpful to the Reporter if we could obtain copies of any prepared statements; and accordingly, participants, after making their oral statements, will submit -- if you have them -- copies of the oral statement that you have in writing. Written comments from those unable to attend and those wishing to submit their oral statements should be received by the Director, Office of Hearings and Appeals, at 4015 Wilson Boulevard, Arlington, Virginia, on or before October 23, 1972 for inclusion in the record.

As you know, a transcript is being made of this record and copies of that transcript can be purchased from the Reporter.

Now, the first person to make a presentation that I have is Gordon Harmston from the Office of the Governor. Will you come forward, sir, and sit right there at the table?

MR. HARMSTON: I'm Gordon Harmston, Director of the Department of Natural Resources, and I'm here appearing on behalf of the Governor, on behalf of the Natural Resources Divisions in my Department.

The reason I came to Vernal is two-fold: First, I'm a native of this region; and second, I wanted to show the

great interest that the State of Utah has in this region and this resource. We have great natural resources in the Uintah Basin just now coming into its full potential. There's more money being spent in the Basin right now on oil exploration than any other place in the world. Oil shale is an important hydrocarbon that will take its rightful place in the energy chain at the proper time. We think the proper time is now.

I remember when I was a child in this area, we always knew we had shale in vast quantities. We've been told that someday it would be developed. Right now we have a raging controversy over our water. We all recognize that in the arid West the limiting factor is water. Utah still has 225-thousand acre feet of water in its allocation of Colorado River water, and presently we're attempting to write a State Water Plan which will utilize our portion of the water. We're taking some 160 acre feet over the Wasatch Front and down into central Utah to develop the natural resources in this area. The Ute Indian Unit has been projected to take additional water.

We want to make absolutely certain that when the natural resources in this area are to be developed economically and wisely that the water will be here to develop it with. This is one of our principal concerns, that we don't take all of the water out of the Uintah Basin and then when the time comes to develop the hydrocarbons, there would be no water

to develop them with.

We have another great interest in this land because we happen to be blessed with many thousands of acres of land that is owned in fee title by the State Board. We have pending an application for well over a hundred-thousand acres of shale oil land that we think we are about to receive. This would be an additional plus for the State of Utah and for our school district. That is where the money goes that it utilized from the State Land Board.

We have two principal concerns in this area. One is the salinity of the Colorado River which is already assuming very disastrous proportions. I say that because right now we are negotiating with Mexico; if we further degrade the quality of water, it's going to cause the Mexicans to be unable to grow crops. Right now we're extensively studying this problem, and we're going to have to do some things to clean up the water that we're presently giving to Mexico so they can continue to develop in the Lower Basin.

So, these are the two constraints, I think. The one, the quality of the water that we have to watch so that any development has got to have rigorous controls written into it so we do not further degrade the quality of the water. The other great concern, of course, is the quality of our air.

Here, again, controversy rages. Are we going to be

able to utilize the billions of tons of low-sulphur coal that we have in the Kaiparowits Basin and the Fremont and Uintah Basins? Anyway, we have to watch the degredation of our air.

One of the things that brought on this great public outcry against the utilization of our fossil fuels is the very inadequate planning and construction job principally in the Four Corners area at Farmington. Since the public outcry Ventury scrubbers have been put on these units. And now, honestly, what used to be a pall over the City of Farmington and used to go into Arizona and New Mexico has practically disappeared within two- or three-hundred yards of the stacks.

There's still oxides of nitrogen and sulphur that aren't completely taken out. Technology does exist, and if proper controls are put on, then we can utilize these great hydrocarbon deposits.

I've given you the views that Utah can only advance as our natural resources are developed and utilized. We want to do it properly, but I have the feeling that if all the Impact Statements that are now required, if all the permits that are now required to allow any additional developments to take place, if these were required in the day of Brigham Young, he'd still be waiting up on the hill -- waiting to go down and settle the Watsatch Front.

It's great that we have public concern. This is the reason that industry has been forced to look and do

further research and to do the very best job that we possibly can. We were instrumental in preparing the portion of the Impact Statement that relates to Utah. We did it with a committee of the best people we had in the State, and the fellow who did most of the work -- and I use the word advisedly -- is here with us today. He's world-renowned. He has really done a great job for the State of Utah and at a great personal sacrifice for himself. He could have demanded much larger pay.

As far as the adequacies of the Impact Statement is concerned relating to Utah, we think we did an adequate job. We think we should go ahead with the proper safeguards that I have outlined, and we should develop this great resource.

I'll give you now Howard Ritzma who will further add to my testimony.

JUDGE DALBY: Thank you, Mr. Harmston.

The second name is Mr. Ritzma.

MR. RITZMA: My name is Howard Ritzma, petroleum geologist with the Utah Geological Survey.

The statement that I have to make today is in the nature of a progress report on a number of matters that were brought up in the original report of the State Committee on the environmental problems of oil shale. The first is the status of oil shale leasing on the State of Utah lands.

The State of Utah owns about 80,000 acres within

the area of thick, rich oil shale in Uintah County. All of these lands are under lease for potential oil shale development. Almost all other State lands on which sizeable thicknesses of oil shale are known to exist are also under lease.

Matter Two, status of State regulations governing production of oil from oil shale and oil-impregnated sandstone. Section 40-6-3.3, Utah Code Annotated 1953, grants the Board of Oil and Gas Conservation, among other things, jurisdiction, as follows:

" -- The Board shall have and is hereby given jurisdiction and authority over the development and production of crude petroleum oil and gas, and crude shale oil, regardless of gravities, from bituminous santstone and/or shale deposits in any manner or form," unquote.

The Board has for over one year considered rules and regulations governing production of oil and gas from oil shale and oil-impregnated sandstone, has consulted with persons in the mining and petroleum industries, and has held public hearings at which the proposed rules and regulations were discussed. The final draft of these rules and regulations were adopted at a public hearing September 20, 1972.

Copies may be obtained from the Division of Oil and Gas Conservation, 1588 West North Temple, Salt Lake City, Utah 84116.

The third matter, mined land reclamation law proposed

for Utah. A committee of the Utah Legislative Council assisted by a citizens committee has prepared a comprehensive mined land reclamation law for consideration by the Legislature which will convene in January, 1973. In its proposed form the law creates a State entity to regulate mining operations of all types that disturb the surface of the land. It requires reclamation of mined lands and proposed standards for such work.

The law, if passed in its proposed form, would figure importantly in the regulation of future oil shale development in Utah.

Matter Four, the status of Utah's land selection in oil shale region. In partial fulfillment of Utah's continuing entitlement to lands from the Federal Domain, the Division of State Lands in 1970 requested that the U. S. Bureau of Land Management transfer title to about 170,000 acres in southeast Uintah County to the State. A sizeable portion of this land is within the area of thick, rich oil shale most likely to be developed, and it includes most of the area suitable for open cut and shallow depth underground mining.

The State's selection is under consideration, but no action has been taken to date.

Matter No. Five, probable environmental studies in Utah's oil shale region. No definite plans have developed for study of the specific environmental or environmentally

related problems in Utah. The U. S. Department of the Interior Draft Environmental Statement dated September, 1972, which is under consideration here today, and previous such statements and supplemental material by Federal agencies have shed a great deal of light on the problems which may arise and have presented much basic data on which action may be predicated.

It is likely that some studies may begin in Utah in late 1972 or early 1973 under the auspices of the University of Utah Engineering Experiment Station. The studies will be part of a survey of clean energy sources initiated by the National Science Foundation.

Just a side mention here. There may be some delay in this due to the death recently of Doctor Larson, the director of the Engineering Experiment Station. His loss is and will be much felt in this matter.

Item No. Six, progress on "housekeeping" items mentioned in Utah's report on environmental problems of oil shale. Work has been undertaken to settle the uncertainties in the coundary between Grand and Uintah Counties. No action has been initiated regarding the position of the Naval Oil Shale Reserve or the lands controlled by the Ute Indian Tribe in the total oil shale picture in Utah.

This ends my statement.

JUDGE DALBY: Are there any questions for Mr. Ritzma?

(No response.)

JUDGE DALBY: That's all then. Thank you, Mr. Ritzma. We appreciate your being here.

MR. RITZMA: I have copies here in case anyone wants one.

JUDGE DALBY: The third name I have here is Mr. Angus representing the Uintah County.

MR. ANGUS: Thank you. I'm Bert Angust of the Uintah County Commission. We have been concerned, like Mr. Harmston said, all of our lives about the oil shale deposits that are here within the Basin. And since in Uintah County a great portion of the land is Federally and State owned, thus bringing no tax to the County, we are interested in any development that will assist our people here.

In our meeting Tuesday -- the official meeting of the County Commissioners -- we passed the following resolution, which I should like to read.

"WHEREAS, the Board of County Commission of Uintah County recognizes the need for a new source of energy, and

"WHEREAS, we understand there are large reserves of oil shale concentrated in Utah, Wyoming, and Colorado, which if developed, would considerably relieve said shortage, and

"WHEREAS, the development would bring needed growth to Uintah County, and

"WHEREAS, the Uintah County Commission believes in orderly development of our natural resources,

"NOW, THEREFORE, BE IT RESOLVED that the Uintah County Commission does hereby support the orderly and planned development of oil shale, and recommends that the development be carried out in such a manner that would create a minimum of disturbance to the ecology, and particularly that such development would include replanting of grasses and other plant life which would support and sustain grazing of livestock and wildlife.

"Dated at Vernal, Utah, this 10th day of October, 1972."

This is signed by the three County Commissioners, Hyrum Slaugh, Chairman, Bert L. Angus, and Melvin J. Burke.

JUDGE DALBY: Thank you, Mr. Angus.

MR. ANGUS: Here are some copies if you are interested in this.

JUDGE DALBY: The next name is Mr. Bent who is representing -- is here representing Mayor Kay.

MR. BENT: Mayor Kay had prepared a statement, but knowing he'd be out of town this morning, he asked me to present his statement for him.

JUDGE DALBY: Will you give us your name first?

MR. BENT: I'm Buell Bent, B-u-e-l-l, City Planning of Vernal.

He starts out, "I am Mayor Kay, and I wish to offer the following statement in support of making available for private development oil shale leases in the three-state area of Utah, Colorado, and Wyoming.

"There is now great concern, as to where our future sources of gasses and oils will come from. We are told that there will be a shortage of gas supplies in less than ten years, that we will import from overseas more and more of our oils as our needs continue to grow and our own supplies are exhausted. We presently are looking to Alaska to relieve the shortage that is most eminent.

"We have here in this three-state area oil shale of such great deposits to alleviate fuel shortages for future generations of American citizens. If these oil shales are developed, great industrial growth will provide jobs and livelihood for many workers and families in Uintah County and the adjacent areas.

"The people of this area have always planned that oil shale would eventually play an important part in the economy of this region. That many new jobs would be created, thereby providing a population growth. That a new tax base for local and State Government would come into being.

"The time is now ripe for these things to happen. There is a need for more fuels. There is many billions of barrels of oil in our door yard in the form of oil shale.

There now has been advancement in know-how to develop and convert to oil one of the world's greatest undeveloped sources of power.

"There are ecologists and environmentalist who oppose oil shale leasing and developing on the same grounds they oppose most everything that may change the natural state of our ecology. I also oppose development that will result in a barren waste. I have full confidence that oil shale lands can and will be developed under such methods and controls that will not detract from the present condition of the oil shale lands, and may even enhance the quality of plant and animal life now sustained on these areas.

"It is most important that steps be taken to prepare the way for leasing oil shale lands in parcels of sufficient size that developers may be interested. Unless this is done, advancement in oil shale development will not materialize. We will continue to deplete our present known sources of fuels, making our nation more dependent on foreign sources for oils.

"It will take considerable time to set up leasing procedures and much longer for developers to design and put in operation plants capable of producing oil from shales that will compete with conventional oil production. For the future security of our nation there should be no further delay in making oil shale leases available to industries capable of

large-scale production."

It is signed, Alvin Kay, Mayor.

JUDGE DALBY: Thank you, Mr. Bent.

I have the name of Glen Cooper on my list from the Vernal Area Chamber of Commerce. Is Mr. Cooper here?

MR. COOPER: I'm Glen Cooper, Chairman of the Industrial Development Committee of the Vernal Area Chamber of Commerce. I'm here representing the entire Chamber of Commerce after their adoption of our resolution last Tuesday in our Board meeting. And I have this resolution before me today.

I would like to state this, that I am also, as Gordon Harmston mentioned, a native of the Uintah Basin. I've lived here all my life, and I've heard the word "oil shale" since I was a mere child. It seems to continue on and on, and nothing has been done about it.

And so I'd like to read this resolution from the Vernal Area Chamber of Commerce which it has brought forth this day.

The resolution reads, "WHEREAS, the Vernal Area Chamber of Commerce recognizes the need for a new source of energy, and

"WHEREAS, we understand there are large reserves of oil shale concentrated in Utah, Wyoming, and Colorado which, if developed, would considerably relieve said shortage,

and

"WHEREAS, this concentration of oil shale is one of the last known reserves of hydrocarbon, and

"WHEREAS, the Vernal Area Chamber of Commerce believes in orderly development of our natural resources.

"NOW, THEREFORE, BE IT RESOLVED that the Vernal Area Chamber of Commerce does hereby support the orderly and planned development of oil shale, and

"BE IT FURTHER RESOLVED that said development be carried out in such a manner that would create a minimum of disturbance to the ecology, and particularly that such development would include replanting of grasses and other plant life which would support grazing of livestock and wildlife, and would ultimately enhance the ecology of the development area.

"Dated at Vernal, Utah, this 12th day of October, 1972."

I thank you.

JUDGE DALBY: Thank you, Mr. Cooper.

I understand there's a representative of the Oil and Gas Conservation Department here. Is anybody representing that organization?

MR. RITZMA: No, they're going to testify tomorrow in Salt Lake City.

JUDGE DALBY: All right. Is there a present representative of the Land Board here?

MR. RITZMA: They'll also testify in Salt Lake. We're trying to cut down on the travel expenses.

JUDGE DALBY: Very commendable.

Now, the next name I have here is that of Mr. Penny, representing Shell Oil Company.

MR. PENNY: Mr. Dalby, Shell does not wish to make a statement at this time. Thank you.

MR. DALBY: Does Gulf Oil Company have any representative?

(No response.)

JUDGE DALBY: No. I also have an indication that perhaps Skyline Oil would have a representative.

(No response.)

JUDGE DALBY: I hear no response.

MR. RITZMA: I think most of these people will be in Salt Lake.

JUDGE DALBY: Is there anybody else here who wishes to make a statement for the record? Would you come forward?

MR. HENDERSON: I thought I was on that list; I apologize, gentlemen. My name is Charles R. Henderson. I'm also a local individual, raised here in the Uintah Basin.

I do not attempt at this time to qualify myself as an expert, but I will let my testimony speak for itself.

I have had a lot of direct and indirect connection with the oil shale and the State land problems, having served

on State land boards and oil and gas -- the Oil and Gas Commission, of which I'm presently a member.

However, today I'm speaking strictly as an individual and speaking as the owner and operator of the C. R. Research Company, Vernal, Utah.

My subject is -- and I have tried to contain this subject to the aspects of the Environmental Report, and you will discover that I have some variances of opinion. And I've kept this as short as possible and attempted to keep as close to the intent of the Impact of the Environmental Report as possible.

The subject is environmental and economic aspects of developing oil shale into gas, oil, and/or electricity for the maximum benefit of all the people of this United States.

The word oil shale, which is used to describe or name a shale that contains no oil, as such, may be a misnomer or simply an improperly named mineral compound. However, the word oil shale has by use become an acceptable name for a mineral compound which is found in over twenty of our United States and many foreign countries.

The principal combination of hydrocarbons found in oil shale has been classified as kerogen. Kerogen, when heated and treated by many and various methods, will change its chemical chain and become a useful hydrocarbon, generally

classified as an oil or gas.

The three states -- Utah, Colorado, and Wyoming -- share one of the largest known deposits of oil shale. The combined deposits are known to cover thousands of square miles, running from surface exposures to depths of over 14,000 feet. These beds are of variable thickness and richness, and they contain many associated minerals.

I would like to address myself to the mining of oil shale for the production of energy in the form of gas, oil, and/or electricity, and the revegetation of the oil shale residue as an additional public benefit possible from orderly and properly planning the development of these tremendous energy sources.

While attending the University I spent a lot of extra time in the chemistry lab, experimenting with the various types and kinds of hydrocarbons found in the Uintah Basin. These hydrocarbons included oil shale, gilsonite, bituminous sandstone, and several others.

The oil shale, because of its tremendous volume and its curious combination of hydrocarbons and salts, aroused my curiosity, and I continued my research and experimentation thereon. Three of the last ten years was devoted almost exclusively to research on oil shale, delaying my research only when it became evident that the Federal Government would make little if any of the essential oil shale land

available for the development, or grant any assurance of acquiring adequate reserves to justify the huge cost of research and pilot plants and construction and shake-down of a plant large enough to make an economic operation.

Incidently, some 40 years ago I found my wife in the oil shale hills of the Book Cliffs; part of their ranch house had been moved from one of the early shale camps. Since that time I have developed a great interest and attachment for the area and attachment for the area, and became concerned as to what effect the development of the oil shale would have upon the environment of that region. I decided to find out, and my studies and experiments have led me to many interesting conclusions, some of which I think will be of interest to you.

My experiments have proven to me that the residue from mining and retorting of the oil shale, if handled properly, will germinate and support plant life and support it in more abundance than does the actual shale in place. The residue and tailings and waste from any shale mining operation will be large in volume, larger than the original volume removed; and therefore, additional space will be required. Since it cannot be returned to its original condition, it should be and could be improved.

The oil shale area in general, where exposed or nearly exposed, is heavily eroded on the surface and encourages floods and creates flood plains and causes or encourages more

erosion, even though the shale is quite resistant to erosion.

Properly planned and orderly developed, the large volume of residue could be properly placed and contoured to eliminate the flood plains and help maintain the essential moisture to support vegetation. The area should be able to provide forage for wildlife, game, and livestock in more abundance than in its natural state.

Oil shale areas are generally short of water, and particularly in the late summer. The development of oil shale will require the saving, storage, or importation of water -- in an already water-short area.

Many people think of the oil shale, because of its tremendous calculated amounts of potential oil, as a great reserve which could be taken in huge quantities, if and when needed. This is definitely not the fact.

The water requirements alone would probably defeat the massive development desired if we found ourselves with our imports of gas and oil cut off, or the oil shale development is delayed until we find outselves in a real acute energy crisis.

Oil shale energies should be considered supplemental sources and not emergency energy reserves.

My experiments bring me to one more interesting conclusion. There is a highly efficient method of converting the energies from oil shale into electricity, a method which

would use very limited amounts of water and contribute almost no or little contamination to the asmosphere.

Therefore, the early and orderly development of this energy supplement to our present energy is most important.

I thank you.

JUDGE DALBY: Any questions of Mr. Henderson?

MR. ASH: Mr. Henderson, do you have information on your revegetation research that you might be able to supply the Department in preparation of a final statement?

MR. HENDERSON: I haven't properly compiled the information, but it could be done. And I could tell you verbally what I have done.

I have taken the residue from retorts which I have used myself which have covered various means of taking the oil from the oil shale. I have picked up residue from every place I've had an opportunity where they are retorting oil shale, and I have taken them and found that in almost every case -- in fact, I can say in every case -- they haven't all turned out perfect, but I've found out that they all will support life.

There's some problems involved in it which I don't want to get into the details of at the moment because they're very complicated because of the salt situation. That can be handled.

And I have planted various types of grasses, other types of seeds, and other -- and set them in the window where they didn't have the most perfect conditions, and they've germinated and grown and developed until they became a nuisance to me and I threw them away.

I could probably offer you some information.

MR. ASH: Thank you.

JUDGE DALBY: Thank you, Mr. Henderson.

Does anybody else wish to make a presentation here?

(No response.)

JUDGE DALBY: I hear no response.

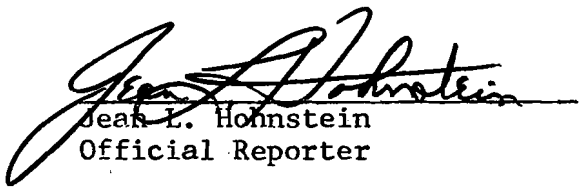
The Director of the Office of Hearings and Appeals has asked me to express his personal thanks for the time and effort contributed by the participants at this meeting. And the comments and opinions will be of assistance to the Bureau of Land Management, and all of the comments will be carefully considered.

And if there is nothing further, this hearing is adjourned.

(Whereupon, at 10:15 o'clock a.m., the hearing in the above-entitled matter was closed.)

REPORTER'S CERTIFICATE

This is to certify that the attached proceedings before the Department of the Interior in the matter of: DRAFT ENVIRONMENTAL STATEMENT FOR THE PROTOTYPE OIL SHALE LEASING PROGRAM, at Vernal, Utah, Thursday, October 12, 1972, was held as herein appears, and that this is the original transcript thereof for the file of the Department.



Jean L. Hohnstein
Official Reporter

UNITED STATES OF AMERICA

DEPARTMENT OF THE INTERIOR

In the Matter of:	:
DRAFT ENVIRONMENTAL STATEMENT FOR THE PROTOTYPE OIL SHALE LEASING PROGRAM	:

Auditorium
State Office Building
Salt Lake City, Utah
Friday, October 13, 1972

The above-entitled matter came on for hearing at the hour of 9:30 o'clock a.m., this date.

BEFORE:

JAMES M. DAY, Director, Office of Hearings and Appeals, U. S. Department of the Interior, Washington, D. C.

PANEL MEMBERS:

KENNETH ROBERTS, Bureau of Sports Fisheries and Wildlife

ALBERT LEONARD, Bureau of Land Management

REID STONE, Oil Shale Coordinator

ANDREW W. DECORA, Bureau of Mines

I N D E X

E X H I B I T S

P R O C E E D I N G S

MR. DAY: This hearing will come to order. My name is James M. Day. I am Director of the Office of Hearings and Appeals, United States Department of the Interior.

Sitting on the panel as representatives of the Department are Mr. Reid Stone, Oil Shale Coordinator; Mr. Andrew DeCora, Bureau of Mines; Mr. Albert Leonard, Bureau of Land Management; and Mr. Kenneth Roberts, Bureau of Sports Fisheries and Wildlife.

The purpose of this hearing is to receive comments on the Draft Environmental Statement for the Proposed Prototype Oil Shale Leasing Program, pursuant to Section 102(2)(C) of the National Environmental Policy Act of 1969.

In accordance with provisions of the National Environmental Policy Act, the draft environmental statement was made available to the Council on Environmental Quality on September 6, 1972, and a Notice of Availability published in the Federal Register on September 7, 1972. This document has been marked as Exhibit 1.

The Office of Hearings and Appeals published a Notice of Public Hearing on the draft environmental statement in the Federal Register on September 7, 1972, scheduling the hearing for today, beginning at 9:30 a.m. Interested parties wishing to appear were advised to contact:

Director, James M. Day
Office of Hearings and Appeals
U. S. Department of the Interior
4015 Wilson Boulevard
Arlington, Virginia 22203

on or before October 2, 1972.

An official reporter, Cheryl M. Woods, will make a verbatim transcript of the hearing. All matter that is spoken while the hearing is in session will be recorded by the reporter. In order to insure a complete and accurate record of the hearing, it is absolutely necessary that only one person speak at one time.

While the hearing is in session, no one will be recognized to speak other than the parties who wish to present statements.

It should be understood that this is not an adversary proceeding. The participants presenting their views will not be sworn or placed under oath. There will be no examination or interrogation of any of the participants. However, the panel may ask witnesses questions in order to clarify matters brought out in the testimony.

The participants will be called in the order shown on the list available at the press table.

Although there will be no strict procedural rules, I would like to stress two important points. The first is that the presentations should be relevant and supported by pertinent data.

If any comment is directed to the draft environmental statement, please refer to the applicable pages of that statement, and if information is quoted from technical or scientific journals or other publications, please give the name, author, page number and date of the publication.

Participants may submit written statements at the conclusion of their oral presentations. The statements will be marked as exhibits. I do not, however, wish to receive written statements as exhibits unless they contain material that has been covered in the oral presentation.

It will be quite helpful to the reporter if we could obtain copies of any prepared statements. Accordingly, the participants will be contacted as they approach the speaker's table to see if copies of their presentation are available. Any such statements will not, however, become a part of the record unless a specific request is made and unless it contains material that is not covered in the oral presentation.

Oral statements at the hearing will be limited to a period of 10 minutes. This limitation will be strictly enforced. To the extent that time is available after presentation of oral statements by those who have given advance notice, I will give others present an opportunity to be heard.

Written comments from those unable to attend, and

from those wishing to supplement their oral presentation at the hearing, should be received by the Director, Office of Hearings and Appeals, at the address previously stated, on or before October 23, 1972, for inclusion in the record. However, because of the great interest in this program and the volume of the environmental impact statement, we are announcing this morning that the time will be extended to November 7.

A transcript of this public hearing will be prepared and the final environmental statement will reflect the comments of this hearing where appropriate.

Copies of the transcript of this hearing can be obtained by making arrangements with the official reporter. Copies of all written statements can be obtained by making appropriate arrangements with the Director, Office of Hearings and appeals.

The Secretary of the Interior, Rogers C. B. Morton, has asked me to express his personal thanks for the time and effort contributed by all of the participants in this meeting. The comments and opinions received will be of valuable assistance to the Department. All comments will be carefully considered in accordance with applicable provisions of the National Environmental Policy Act of 1969.

At this time, I would like to read into the record a statement by Senator Bennett of Utah.

"I appreciate this opportunity to present testimony in support of the Department of Interior's Proposed Prototype Oil Shale Leasing Program.

Because of the pressing need for new sources of clean engergy, President Nixon's announcement of a new leasing program on Federal oil shale lands in Utah, Wyoming and Colorado was warmly applauded.

As the Deseret News recently stated 'By the end of this decade the United States may be faced with an oil shortage unless it starts planning ahead now to meet this contingency. With energy demands doubling every 10 years, America has become increasingly dependent on foreign oil supplies that could easily be cut off in the event of war or some other international crisis.'

There is no commercial production of shale oil in the United States at this time, because a mixture of problems -- environmental, technical, and economic -- have thwarted past efforts at development. For the past 30 years there has been a procession of programs, pilot plants, demonstrations plants, project and studies of oil shale on which the Draft Environmental Statement is based. If we are ever to develop this valuable resource, it must be now.

Therefore, I hope the Department of the Interior will meets its timetable and issue its first leases in December 1972.

The oil from shale, besides being relatively low in

potential pollutants, could help meet a substantial portion of the Nation's energy needs for many decades. But development of plants and transportation facilities will take time and even if there are no further delays shale oil cannot be expected to come on stream till the 1980's.

The development of a viable oil shale industry would greatly broaden Utah's tax base and would provide a much-needed economic stimulus to the Uintah Basin.

I was especially pleased to learn from the Draft Environmental Statement that the effects on the environment would be minimal in the isolated tracts chosen for the Utah program. Both the President and Secretary Morton have stressed that the Administration is irrevocably committed to the maintenance of the environmental integrity of the oil shale area and no development of public oil shale lands will be authorized until the Secretary is convinced that all requirements can be met.

I hope we can go forward with this program that will mean so much to our State and Nation."

The first witness this morning I call is a representative from the Equity Oil Company.

MR. DUGGAN: I am Paul Duggan and I delivered a statement in Denver last Tuesday. I wish to thank you for the opportunity to appear here today. We have nothing further to say at this time, but we may make a comment further in

writing before the deadline.

MR. DAY: Thank you.

I will now call Mr. Frank Allen.

MR. ALLEN: My name is Frank J. Allen. I am Vice-President of Western Oil Shale Corporation. Western Oil Shale Corporation holds some 76,000 acres of State of Utah oil shale leases of lands in Utah's Uintah Basin. The Corporation has long been dedicated to the concept that much of the nation's deep-lying oil shale is amenable to in situ processing if permeability of the host material can somehow be induced. The Corporation is further dedicated to the concept that the release of nuclear energy and perhaps some lesser explosive force would produce the necessary permeability.

To demonstrate the theoretical feasibility and safety of a nuclear approach to recovery of oil from shale, Western Oil Shale Corporation sponsored a symposium on the subject at Laramie, Wyoming, on February 17, 1971. At the symposium, papers were presented by representatives of the Bureau of Mines' Laramie Energy Research Center, the Atomic Energy Commission's Lawrence Radiation Laboratory, and CER Geonuclear Corporation. It was clearly the view of the participants in that symposium that vast quantities of oil shale could be made susceptible to in situ recovery treatment with nuclear explosives without real concern for environmental degradation.

At this time, our comment is solicited on an Environmental Statement. We find the Statement to be an intense work a prodigious work, perhaps even a monumental work. On no occasion in history, possibly with the exception of the Children's Crusade, has no much effort been expended in support of an obviously wrong view.

Our fundamental criticism of the Statement is that it attempts to justify an oil shale policy that is not a policy at all; it is rather an abnegation of responsibility, at a time of national energy crisis, to adopt a positive program with regard to our most abundant fuel resource.

The Department's policy and Statement are totally oriented to a mine-retort technology suitable for a small percentage of the oil shale deposition. The objective seems to be to make a little more resource available to companies which have already developed an art from recovering oil from rich shale.

We submit that total reliance on the technology already perfected will not contribute significantly to the effort to achieve national self-sufficiency where energy is concerned. We further submit that the approach exclusively endorsed by the Department creates the highest risk of contamination.

To some degree, the criticism we express can be justified by reference to the Environmental Statement itself.

We will consider the concerns above articulated separately in the light of the data contained in this Statement.

I

THERE IS LIMITED MATERIAL AMENABLE TO A MINE-RETORT APPROACH

The total oil content of the oil shale deposition over the three state area is often expressed in trillions of barrels. Nevertheless, the kind of occurrence thought to be ideal for mine-retort exploitation would average 30 gallons per ton through a 30 foot interval (Chapter II, Page 9). The National Petroleum Council (ibid) estimates that 130 billion barrels of oil is contained in deposits meeting these criteria with less than 1,500 feet of overburden. Such deposits are found almost exclusively in the Piseance Creek Basin. This sounds like a resource which could make a major contribution to the solution of the energy problem. Unfortunately, the Statement also reveals (Chapter II, Page 23) that about 2 1/2 million acre feet of water is stored in the Green River formation of the Piseance Creek Basin. We interpret the ground water summary to indicate that this ocean of water is predominantly found in the upper regions of the formation. We, therefore, postulate that much of the material containing the estimated 130 billion barrels could be mined only if the means of coping with this vast quantity of water were designed. It appears that much

of the water is saline and less than potable and could not simply be diverted into water courses on which the populace relies.

In any event, the procedures of mining, sizing and retorting shale, disposing of waste and upgrading the fuel substance involve plant and expenses which only a few major oil companies could undertake. It may well be that the available rich, shallow oil shale will support a considerable industrial effort, that is, the enterprize will be profitable for the companies which engage in it. The total output from such plants can hardly satisfy any major percentage of the country's fuel needs.

II

THE MINE-RETORT APPROACH PRESENTS THE HIGHEST RISK OF ENVIRONMENTAL DEGRADATION

Beginning at Page 21 of Chapter I of the Statement, the problems of waste disposal from a surface retort are discussed. Some disposition other than consumption must be made of about 85 percent of material mined which will, after processing and removal of the fuel component, have a volume of about 12 percent in excess of the volume of the total material originally mined. The Statement seems to accept as perfectly sound the proposition that the waste material can simply be returned to the space from which it was removed. The Statement does not relieve our apprehension that the

return of waste materials to an operating mine will prove to be an unsafe, uneconomic, and physically impossible task. If the waste is disposed of by dumping on the surface, the mechanics of pollution are well delineated by the report. One must be concerned about the leaching of water soluble components of spent shale which are highly alkaline. One must be concerned about the dust, one must be concerned about the effect on vegetation and general land contours, and one must be concerned about the aesthetics.

III

IN SITU METHODOLOGY MUST FINALLY BE DEVELOPED IF THE OIL SHALE RESOURCE IS TO BECOME A SIGNIFICANT FACTOR

The Statement asserts that there are, in oil shale zones averaging 15 to 25 gallons per ton, some 1,200 billion barrels of oil content (Chapter II, Page 9). In general, the Statement adopts the view that any material averaging less than 25 gallons per ton is not worthy of short-term consideration. The magic figure "25 gallons per ton" has relevance only to a mining approach to oil recovery. We are told that the figure was a calculation by a committee which figured the cost per ton of mining material, the cost of retorting and the efficiency of the retort process. At a market price per barrel of oil at the time of the calculations, it was not theoretically profitable to mine and retort material which did not contain 25 gallons per ton. If in situ program

is employed, the calculations which support the 25 gallon per ton figure as the economic cut off point are no longer relevant. The critical question, when in situ programs are engineered, is simply what richness of shale will release significant fuel substance if it is rubbelized in place and appropriately heated. The Bureau of Mines at Laramie has attempted to simulate underground conditions in above ground retorts and has concluded that shale of the order of 15 gallons per ton could produce oil economically if a number of assumptions about what would happen if nuclear energy were released in formation are indulged. The advantages of in situ treatment inhere in the facts that there are no disposal problems, a much vaster resource becomes worthy of consideration, and the end result is a supperior product. At Chapter I, Page 36 of the Environmental Statement, the compilers report that oils from in situ operations appear to have lower pour points, viscosities and nitrogen contents. What disturbs us is that Interior plans no effort in the near or even remote future to advance the technology oriental to those shales which are our real hope for national self-sufficiency.

IV

IT IS THE OBLIGATION OF THE FEDERAL GOVERNMENT TO ADVANCE THE STATE OF THE ART

Without question, the United States owns the great majority of the oil shale resource in the United States. Particularly, it owns the deep shales which, if materials

averaging 15 gallons per ton are considered, contains some 90 percent of the total oil in place. In commenting on planning for a nuclear experiment in Utah, the Statement makes no reference to our symposium. Instead it cites a Tribune article by Robert Woody. (Reference 26)

The United States also has exclusive access to the only form of energy which could be expected to propagate in formation the kind of permeability which is a prerequisite to in situ treatment. These deep shales represent trillions of barrels of oil and yet the United States has consistently refused to detonate in oil shale formation devices in the size range commonly detonated on an almost weekly basis at the Las Vegas test site. The Departmental Statement shows that the United States is content with an oil shale policy which will simply make available to major oil companies areas which are ideally suited to technologies which are extremely expensive to employ and which cannot be expected to produce enough oil to afford real relief in the crisis. We submit that the Federal Government should take the lead in an immediate intensive effort to find a technology to which the major oil shale resource will be susceptible. We are submitting with this Statement a copy of the Transcript of Proceedings at the symposium above referred to. The symposium clearly suggests one rather inexpensive procedure that could be followed to

establish whether or not we can really look to oil shale as a meaningful supplement to the nation's traditional energy sources.

Thank you.

MR. DAY: Thank you, Mr. Allen.

Mr. E. J. Merrick, National Wildlife Federation representative.

MR. MERRICK: Edwin J. Merrick, Southwestern Representative for the National Wildlife Federation, and we provided a statement in Denver, Colorado. I simply want to take this opportunity to make a few points a little more clear, perhaps.

I do want to emphasize that we feel the oil shale technology is too primitive to proceed with and should not proceed until further laboratory development has been carried out and a critical and knowledgeable citizen's committee can review the progress and plans.

Secondly, should prototype leasing proceed regardless of the stipulation requiring no less than the following:

(A) That an overseer's committee of representatives of government, industry, conservation, wildlife and concerned citizens review and approve the plans and progress in all prototype developments.

(B) That specific legal clauses with respect to handling, control and replacement of overburden as well as

spent shale.

(C) Specific clauses with respect to control of contaminant levels in air, water and total surrounding environment be included.

(D) That specific clauses with respect to measurement, monitoring and the care and enhancement of all aquatic and wildlife in the prototype areas.

(E) Specific clauses requiring public release of the continuous status of all pollution and contaminant levels during the life of these prototype leases.

Finally, and subsequently, we have a common concern in the preservation of wildlife for future generations. That you have a critical responsibility here. Do not be overly hasty. Seek a democratic approach and solicit the aid of concerned citizens who seek not profit but a concern that environmental justice be done.

Thank you very much.

MR. DAY: Thank you, Mr. Merrick.

I will now call Mr. Stanley Mulaik on behalf of the Utah Nature Study Society. Repeating Mr. Stanley Mulaik on behalf of Utah Nature Study Society.

(No response.)

I now call Midge Collins.

MS. COLLINS: I am Midge Collins, 2775 Oneida Lane, Provo, Utah.

Q What is to become of the 300 species of wildlife found in the area of the proposed development?

A Mule deer, mountain lion, bear, elk, sage grouse, antelope, blue grouse and migratory birds would be most affected as well as approximately 500 wild horses that range in the region. They will be endangered by construction, noise from mining and refining, possible oil pipeline leakage, human population increases, and the loss of food and cover due to the disposal of oil shale wastes.

Q Can we cope with the massive amounts of waste?

A A full scale industry producing 3 million barrels of oil per day would require disposal of 4,500,000 tons of spent shale per day. This would cover 4,640 surface acres every year. After plenty of fertilization and constant watering of the waste, vegetation will be established again, however, the natural plant community of the area will be destroyed.

Q How can orderly, high quality development and planning occur?

A The temporary population during construction would be more than double the permanent population at the sites when construction is completed.

Q Do we really need oil shale development?

A By the time shale oil makes it contribution to our energy supplies (1980) other energy sources, more acceptable environmentally, may be found. For instance, garbage, trash

and animal wastes have successfully been converted into low-sulfur oil by the U. S. Bureau of Mines. I urge the establishment of a National Energy Policy before another major public resource is developed.

MR. DAY: Thank you.

Mr. Leslie A. Jones, Heber City, Utah.

Mr. Jones, give a short address for the record.

MR. JONES: It is on the presentation. I appreciate the opportunity to appear at this time, and all of these presentations are presenting viewpoints that act as checks and balances to each other and I trust the Board will treat them equitably for this is the necessary procedure.

I will read what I have, but I subscribe to much of the comments of Mr. Allen and Mr. Merrick, and I am in sympathy with some of the things Senator Bennett said. ENVIRONMENTAL IMPACT OF THE EXTRACTION OF OIL SHALE IN THE STATES OF COLORADO, WYOMING AND UTAH AND CONTROL OF THE IMPACT ON THE ENVIRONMENT. Man will have to use the oil in oil shale. But how fast? I feel the technique for extraction with minimum environmental impact should continue to be researched and perfected in pilot plants and in very small scale production for at least fifteen to thirty years yet. And I feel the extraction should proceed, when it has to, at a rate slow enough that the environmental impact can be absorbed by the earth with some help from man, adequately to

insure an inspirationally liveable land for man. Man cannot live in peace with himself and his neighbors without inspiration. Only the beauty of the land, the rivers, the seas and the heavens can provide this.

And rivers and streams are the heart of all land based ecological systems. And they will be the hardest hit by the development of oil shale. To extract the oil they need a slow and careful development of oil extraction in quantity, particularly in a deseret country, to be able to handle the alkalies, minerals and acids and to provide water without robbing all other interests of water in the locale of oil extraction plants. I subscribe to Dr. J. R. Guadagno's water report that was submitted to me previously. So, we take time, we plan and we prepare for whatever we do. I am a member of the Audubon Society, National Wildlife Federation, EDF and I represent the interests of the American Canoe Association and WRG. I have worked in engineering for thirty years, and have been involved in the mining of Gilsonite and the development of the modern plant designs for the extraction of oil from shale with other minerals. There is much, obviously, I do not understand about it, but I think this stands for all of us. I helped build the Western River Guides who run the rivers through these lands of oil shale and know them and their geology well.

But my real qualifications to speak here are: I own

one automobile and promote the use of lighter cars and motorcycles. I designed and built an electrically heated home with Urethane insulation cutting my power use. I practice recycling. I enter into planning and design to develop power from the sea and from the wind. I run and survey our rivers and get them protected and kept clean. Not much. But "action" is all that qualifies any of us.

And I built on a foothill out of Midway away from farmlands and flood planes.

ALTERNATIVE POWER RESOURCES TO FOSSIL FUELS

Alternative resource to fossil fuels have not been nearly adequately researched and developed as has been brought out. There is so much we have not thus done that we should be doing; that we are remiss if we do not do these things first. Not to mention the familiar ones such as nuclear and fusion fuels which have their own ecological and development hang-ups, geothermal, hydro-electric, liquid hydrogen steam, and several others. There is also power without measure in oceanic rivers, in the prevailing winds over high points. We must tap them. They are clean resources.

THINGS WE CAN DO TO CONTROL THE RATE OF USE OF FUEL AND POWER ...AND TO SLOW DOWN OUR NEED FOR OIL IN OIL SHALE:

1. Place an extra fifteen to twenty cent tax per gallon on gasoline and diesel fuels excepting mass transit and railroads. The tax to be used exclusively to help protect

and restore the environment -- which is our life, and to research additional power resources. This will cut out 25% of the use of automobiles (for luxury), get half the trucks off the highway and get freight and people back on the railroads and into cooperative and mass transit. MOST important - it will work. It will get environmental efforts off from dead center and moving.

2. Recyling must be developed to its full potential which is vast as a fuel mineral and oil resource, including the processing of garbage.

3. Design and install high point prevailing wind power generators and oceanic river power generators - designs are on the board and they are competitive.

4. Re-educate people against using power as a fad and to use power equipment only as a necessity to life.

5. Educate people to realize big cars make the roads unsafe for little cars and motor bikes and waste fuel -- little cars are not basically unsafe. Or should we all be driving Patton tanks? At two miles to the gallon.

TIME SCHEDULE OF SHALE OIL EXTRACTION AND INVESTING OUR MONEY

When reasonable efforts in the above are made and sustained the need for larger scale extraction of oil from shale should not be critical until 25 to 50 years from now. Research will improve extraction techniques so far beyond present capabilities, in respect to environmental protection and cost

that it becomes ridiculous and tragic waste to invest heavily in the present second, third or fourth best methods and plants as compared to those we will produce in the future within twenty years. The need is not that critical at the present if the preceding steps are followed.

NATIONAL ENERGY POLICY needs to be developed and put into action to guide and subsidize research and development, to phase in and out the use of power resources, to reorder our systems of transport, to reduce the use of power in homes and offices with better insulation and less wasteful habits, to schedule the development and use of each energy resource so that its environmental impact is small enough to be absorbed by the environment with some help from man without permanent or serious harm to the environment and therefore to man. National Energy Commission needs to set asise well planned wildlife habitat areas from strip mining for coal or oil shale.

MINING METHODS AND RESEARCH AND DEVELOPMENT

I would like to see research to perfect leaving the shale where it is taken from -- or at least the same or similar quantity. Even though it is expanded to twice its size. And there must be a topsoil cover that is removed and replaced where possible. I am sure some commercial uses can be found which will alleviate the shale quantity. To wit, insulation, cinder block like they use in Mexico with built-in insulation just for a starter.

If small canyons are filled this promotes more wash down of processed shale into lower farmlands, a disaster, In situ procedures would reduce this with standard roll over strip-mining procedures, including replanting. Mobile or partially mobile plants, with smaller decentralized furnace units need be developed for this purpose, for in situ is the most efficient way of handling immense material quantities. OIL SHALE AND FOSSIL RESOURCES MUST BE PRIMARILY RESERVED TO INSURE LUBRICANTS AND PLASTICS RAW MATERIALS FOR MILLENIA TO COME...We don't want to be remembered as the generation that raped the resources of all future generations of time.

Thank you.

MR. DAY: Thank you very much, Mr. Jones.

I now call on a representative of the Utah Audubon Society.

MR. LAMB: I am Harold Lamb, M.D., 1060 East First South, Salt Lake City.

I speak with some hesitancy because of lack of expertise on mining technology in reference to a project such as this, but I have found that the material which is presented is voluminous and I haven't read it all yet; and I can't help but compare it to the Central Utah project, the environmental draft that I read recently compared to that, this is a master piece.

It seems to me too that the suggestion of pilot

programming is a good one rather than proceeding full speed ahead with full development although I suspect this is a matter of economics rather than a matter of concern about environmental problems.

The message that seems to prevail throughout this report, however, is the insatiable and urgent demand for power. Even with full use of the resource this is only a delaying action if basic reforms on demands are not brought about in the near future.

The Utah Audubon Society agreed with assessment of economic problems presented by the Club of Rome, British investigators, Cal Tech scientists, and recently Verner Von Braun and other astronauts and physicists. Even though disagreement is proper and understandable the fact that such a consortium of scientists are apprehensive about our course, their assessment of the problem should be considered to be at least a reasonable possibility.

With this in mind, the Utah Audubon Society believes the report does not emphasize sufficiently the need for vastly expanded and accelerated research and development of alternative sources such as hydro-dynamics, solar power, and so forth. And we believe the energy crisis is so serious that mobilization of skills, at least equivalent to the Manhattan project, is required to develop energy producing technology that minimizes environmental damage.

We talk a good deal about energy crisis but we aren't acting like we have it, just increase production, and as suggested perhaps in this document it is not a solution to the problem, but perhaps even an acceleration of our present disastrous course.

More specifically to the document, most of the alternative sources of energy are dismissed on a basis of lack of technology or inadequate lead time for development. This is a legitimate comment, but we also do not have successful techniques for land rehabilitation following strip-mining. In the case of oil shale strip-mining or even shaft mining there is a good case that the extent of land damage is so great as to also deny its feasibility. Even in the pilot projects the disposal of spent shale or fluff is a major undertaking with estimates of over 1,000 acres per year needed for disposal. This spent shale is also a sterile material, and without added nutrients and water, attempts at vegetation will undoubtedly fail.

In a land of already an adequate water supply, the need for approximately 135,000 acre feet for the prototype development would almost certainly require water from other uses -- agriculture.

In the report we find a discussion of wildlife resources which takes the usual tack: it ordinate importance is placed on game species with almost total neglect of

non-game species.

There are an estimated 300 species of wildlife in the involved area, but only a few are mentioned.

Reducing the demand for energy is discussed to some degree particularly in the case of mass trans-systems as an alternative priority of use, which is dismissed too easily; and in an unconvincing fashion. Mass transit will work when adequate funding and services are provided and if individual choice of private transportation, at least in a commuter role, is not permitted.

The use of atomic detonations to facilitate oil shale production, in fact the acceleration of atomic power plant once the problem of radioactive gaseous effluents and adequate safeguards have been solved, or development of techniques to accelerate degradation of waste products seems to offer less obvious environmental harm than the present proposals.

This is my verbal statement, and I will submit a written statement in time.

MR. DAY: Is there a second representative from the Society?

MR. LAMB: There was, but I don't see him here.

MR. DAY: I now call on Mrs. Nyla Kladder on behalf of the Audubon Society of Western Colorado.

(No response.)

I now call on a representative of the Oil Shale Corporation.

MR. YARDUMIAN: My name is Louis H. Yardumian, and I am a Vice President of The Oil Shale Corporation, a publicy held, private corporation. The company that I represent, whose trade name TOSCO may be familiar to you, is the owner and licensor of the TOSCO Process, a process for the extraction of oil from oil shale. As a participant in Colony Development Operation, TOSCO and its co-venturers have conducted extensive field operations utilizing the TOSCO Process, including the operation of a 1,000 ton per day semi-works plant and mine at Parachute Creek. These activities have demonstrated the feasibility of the process and developed satisfactory solutions to environmental and other related problems. That operating experience, which began in 1964, and included the mining of more than one million tons of ore by TOSCO and its partners, is the basis for my remarks today.

Our company appeared earlier this week at the Denver hearings, as did Colony Development Operation, and TOSCO and Colony will be submitting detailed written comments. Accordingly, my remarks here will be brief and principally for the purpose of discussing one or two misconceptions about the Prototype Leasing Program which have manifested themselves at the earlier hearings and which may also arise here today.

We view the Draft Environmental Impact Statement from the vantage point of a company that over many years has carried out extensive work relating to both the technology of oil shale extraction and environmental control measures. We believe the Draft Statement, as well as the concept of a test lease program to be major accomplishments. Indeed, for the first time in our country's history, comprehensive environmental guidelines are being established for the development of a natural resource well in advance of industrial commitment.

That the Department of the Interior has carefully designated the program as prototype seems to be overlooked by some. Yet it is clearly set forth as a limited program, designed to test in field operations the technology of recovering oil from oil shale, and, more importantly, to determine the environmental effects of oil shale production under carefully controlled and monitored conditions. It will, therefore, produce operational data to be used in determining the desirability of proceeding with an expanded leasing program.

We believe that no more sensible approach could be devised to provide answers to the many questions that have been posed by industry, public interest groups, and the Government concerning the environmental effects of such development. The program, which will utilize less than one

half of one percent of the Federal oil shale lands in Colorado, Utah and Wyoming, will be conducted under carefully monitored regulations to define with certainty the environmental effects of such development. It will assure compliance with all existing and proposed environmental regulations by both Federal and State Government.

We are confident that the successful completion of this program will demonstrate that development of oil shale can be performed in an acceptable environmental manner, thereby making available large quantities of petroleum products. Those petroleum products include low-sulfur fuels which are essential to the improvement of air quality in our country today.

I might add that in view of the mounting pressures to provide for additional, secure supplies of petroleum, it is important that we resolve the feasibility of recovering this energy resource before we are faced with such urgency that a crash program is inevitable. The U. S. economy is heavily dependent on plentiful energy supplies. Sensible environmental protection measures can be made a part of this system. In this respect, the evolvement of the oil shale leasing program will exemplify the accommodation of environmental protection with resource development -- and in the process, lay the groundwork for a much needed contribution to our country's energy base.

As a final comment, I would offer the observation that commercial-scale oil production will only come about in a step by step fashion, thus affording substantial time between plant startups to modify environmental programming. Thus, a popular conception that a Federal leasing program, together with development of private lands, would mean an immediate one million barrel per day shale industry is simply not the case. Commercial oil shale plants represent sizeable investments of somewhere between $250--$400,000,000, depending upon plant capacity. It is likely no more than one or two plants will be started within the next few years. That operating experience -- Technological, mechanical, economical and environmental -- will be fully reviewed before other plants begin. Thus, since the construction period alone consumes two to four years, there will be ample opportunity to re-evaluate environmental requirements.

In conclusion, I would like to express our thanks to the Department of the Interior for this opportunity to appear. The Oil Shale Corporation has, as a matter of policy, viewed the solution of environmental problems as being no less important than the solving of technical process problems. We are committed to commercial oil shale development only under environmentally acceptable conditions.

We congratulate the Department of the Interior on the Draft Environmental Impact Statement. It is a thorough

and professional analysis. It provides a rational system for the development of a new industry under controlled conditions which will minimize undesirable environmental consequences. The effort deserves our wholehearted support.

Thank you.

MR. DAY: Thank you very much.

Mr. Max D. Eliason.

MR. ELIASON: My name is Max D. Eliason. I am Vice President, Director and Legal Counsel for Skyline Oil Company, which is headquartered in Salt Lake City, Utah.

We are pleased to have this opportunity to comment on the Draft Environmental Statement for the proposed prototype oil shale leasing program. Our Company has taken an active role in efforts to launch an oil shale industry in this Country, and we are encouraged that the Federal Government at long last is following a vigorous course to insure the development of this valuable natural resource.

As an indication to you of Skyline's involvement and interest in oil shale, it should be noted that Rulon K. Neilson, the President of our Company, was one of the original participants in the founding in 1955 of The Oil Shale Corporation, commonly known as Tosco, and Skyline itself was an early investor in that Company. We presently own 773,330 shares of the outstanding stock of Tosco. Tosco was established for the purpose of developing a process to

recover oil from oil shale rock and, along with its partners, has now expended in excess of $45 million in this endeavor. It appears now that they have succeeded in perfecting their process to the point of commerciability.

In addition to our commitment through Tosco, Skyline owns in fee 16,154 acres of prime quality oil shale properties located in Uintah County, Utah. For your information, we are submitting for inclusion in the record a copy of our most recent Annual Report which shows on page 8 thereof the location of our properties. You will note therefrom, that some of our lands are contiguous with the Federal tract designated U-(b), which is proposed for offer for leasing under the prototype leasing program. For this reason, Skyline is quite familiar with the area around the two tracts which would be offered for lease in Utah.

Skyline's oil shale reserves are presently subject to leases granted to members of the Colony Development Operation, namely: Atlantic Richfield Corporation, Sohio Petroleum Company, The Oil Shale Corporation, and The Oil Shale Corporation, and the Cleveland-Cliffs Iron Company.

As a representative of Skyline Oil Company, I have been actively involved in oil shale matter through the Rocky Mountain Oil and Gas Association (RMOGA), in which I have served as Vice President for Utah and Idaho. I have served as a charter member of The Oil Shale Committee of RMOGA

since it was first organized in the summer of 1963. In 1966, the name of the Committee was changed to the Oil Shale and Synthetic Fuels Committee, in recognition of the fact that we, as a nation and as an oil industry, must concern ourselves with the development of all of our synthetic fuels, including oil shale.

As you are already aware, the Rocky Mountain Oil and Gas Association has expressed at other hearings this week its approval of the Draft Environmental Statement, and has urged that it finally be adopted so that this vitally needed leasing program can go forward.

Our Company is among those which applauded the announcement several years ago of the new policy of the Federal Government to remove the 42-year moratorium on leasing oil shale reserves on the public domain. Valuable time has already been lost in implementing this policy, and we urge that the prototype oil shale leasing program be inaugurated without further delay.

We had high anticipations that this leasing program would have been started in 1970, but it was postponed at the last minute by the Secretary of the Interior who directed that more study be given to environmental problems prior to implementation of the program. In June of that year, hearings on the program were held in each of the States of Utah, Colorado and Wyoming.

At the Utah hearing, Skyline expressed strong opposition to any further delay in moving forward with the Federal oil shale leasing program. We pointed out then that Tosco and other members of the Colony Development Operation had been engaged since 1965 in studying the environmental impact of an oil shale industry, and that many of the environmental problems of this unborn industry already had been identified and solved. We stated that further studies of these problems could be made after an oil shale lease sale was held, since there would still have been considerable time needed to develop adequate technologies and to construct commercial plants.

At that hearing, we voiced as forcefully as possible our grave concern over the growing dependence of our Country on imports of oil from foreign countries, many of which are unfriendly to the United States. We cited the serious problems confronting the development and marketing of the North Slope oil and gas reserves, which still are in a figurative deep freeze, and warned of the contined decline in reserves of oil and gas in the contiguous 48 States. We believed then, and we believe now, that immediate and purposeful action must be taken to save the United States from an energy-shortfall disaster.

Despite our urgings for immediate action, the prototype leasing program remained in suspension pending

further studies. I served on the Utah Committee appointed by Governor Rampton to prepare the report on Environmental Problems of Oil Shale which was used by the Department in compiling the Draft Environmental Statement. We, as a Committee, worked diligently to identify all potential problems which might arise from a commercial oil shale operation, none of which appear to be insurmountable.

During the approximately two and one-half years since the Secretary directed that further environmental studies be made, considerable information has been obtained concerning the environmental and other aspects of the proposed prototype program, as is evidenced by the comprehensive three-volume Draft Statement which we are considering at this hearing today. We commend the Department of the Interior and all persons responsible for the preparation of this Draft Statement, which is very comprehensive and detailed.

In the interim, and while these studies have been going on, the energy situation of the United States has deteriorated dramatically. The shortage has become much worse in that short period of time than anyone had predicted and it appears to be getting more critical daily. Consequently, we reiterate our plea made in 1970 that this leasing program be started immediately.

We should not wait until our energy shortage gets even worse before we take steps towards an orderly

development of our oil shale reserves. Now we appear to have time to conduct a prototype test leasing program for oil shale which will help us to test the answers that have been developed to environmental problems and make further improvements, if necessary. If we wait any longer, we may be forced into a crash program involving hasty and unwise decisions. Then our environmental problems could become much more severe.

One obvious conclusion which must be drawn from the Draft Statement is that an oil shale industry will have a noticeable impact on the environment. However, there are no activities by men on this planet which do not have environmental significance. Many of the effects from an oil shale industry are very similar to those associated with any large mining operation. Technologies already developed and presently being employed by industry will do much to mitigate the effects thereof, and further beneficial technological breakthroughs can be expected.

One of the most serious obstacles to the development of a fully mature oil shale industry is the availability of adequate water supplies. The needs, however, still cannot be fully assessed. The prototype test leasing program for oil shale, as mentioned in the Draft Statement, "could provide a body of hydrologic knowledge with which better water utilization can be accomplished, and better pollution and

technical control measures established for the ultimate development of the oil shale resource."

The States of Utah, Colorado and Wyoming are entitled to their fair share of the water from the Colorado River drainage system, but unless we start putting this water to a beneficial use such as in the development of an oil shale industry, we may lose our rights to this water forever. This is another reason why time is of the essence in starting on the Federal leasing program. The information to be obtained from this prototype program is needed for future planning.

The Draft Statement considers alternative sources of energy which might be used in lieu of undertaking oil shale development, such as increased oil imports, increased domestic production, nuclear energy, and coal gasification and liquefaction. It is important to realize that each of these alternative sources of energy has its own peculiar environmental impact problems. Thus, the decision to postpone oil shale development would not reduce environmental problems; it would merely shift the stress on the environmental to the alternate source of energy instead of oil shale.

The United States is now at the point where we cannot afford the luxury of choosing between different alternative sources of energy; instead, we must utilize all

sources of supply in order to meet our needs. We must also use wisdom in conserving our resources and in avoiding the waste thereof.

Efforts have been made recently to undertake an extensive project for the nuclear stimulation of tight natural gas reservoirs on Federal lands in the Piceance Creek Basin of Colorado, in the heart of the rich oil shale deposits. Caution must be followed in approving any such project which might impair the future flexibility to develop the Federal oil shale reserves in the most efficient and least wasteful manner. There are many tight natural gas formations throughout the world where nuclear stimulation projects can be undertaken, but this Country's prime oil shale deposits are situated only in a very localized area.

The energy value of the natural gas which could be obtained from a nuclear stimulation program in the Piceance Creek Basin would be miniscule in comparison with the energy value of the oil shale reserves under the same lands. It does not appear sensible for the government to help sponsor nuclear stimulation programs that could adversely affect the value of Federal oil shale reserves in the richest oil shale region in our Country.

The suggestion has been made that we reduce the demand for energy in this Country. We agree that every effort should be expended to educate the citizenry to conserve

energy. Such an educational program will be a long-range endeavor, however, and can only hope to reduce but not eliminate the shortage of energy which our Country now faces. One of the best methods of educating the public to the need to conserve energy as well as to develop additional supplies to meet their needs is to allow the prices of energy products to rise to a level commensurate with the costs of finding and producing them plus a reasonable profit. The domestic exploration for oil and gas has declined to less than one-half of the level of 1956 as a result of increased costs without compensating increases in prices. We trust that the leaders and citizens of this nation will see the need for such price adjustments and that these will be implemented in the very near future.

The question which must be answered now is whether the benefits to be derived from an oil shale industry more than offset the adverse effects upon the environment which will be caused thereby. We believe that the answer to this question is clear, from a study of this draft environmental statement and other considerations, and that such answer is overwhelmingly in favor of moving ahead with this program.

Volume II of the Draft Statement contains an excellent analysis of the alternatives available to us for meeting our energy demands. We agree with the conclusion found on page 206, therein, which is that "...in view of the

foregoing, it seems reasonable to postulate that for some time to come the basic alternative to the production of a million barrels of shale oil (per day) would be a million barrels of imported petroleum."

This alternative of relying on imported petroleum is totally unacceptable for the many reasons which are discussed in detail in the Draft Environmental Statement. It is shocking to witness the rapid acceleration in our dependence on imported oil. In the October issue of the Kiplinger magazine called Changing Times, it is pointed out that in 1971 the United States consumed approximately 15 million barrels of oil per day and that by 1985 demand will be about 27 million barrels of oil per day, with domestic production then totaling about 10 million barrels a day. Present projections, for just three years from now, or by 1975, call for importing approximately 39 per cent of our oil.

The President has been forced during the last year alone to increase dramatically the quotas for importation of oil into this Country in order to meet demand. Within the last month he authorized an increase in imports east of the Rockies of 622,600 barrels per day during the last quarter of 1972. This was the second major increase in the import program this year. Levels east of the Rockies were boosted 230,000 barrels per day, or 15%, in May. This illustrates

the timeliness of the President's call in June of 1971 for the Secretary of the Interior to initiate "a leasing program to develop our vast oil shale resources, provided that environmental questions can be satisfactorily resolved."

The excess production capacity of the U. S., which the draft environmental statement claims will be exhausted by 1973, has already disappeared. Oil wells in the Gulf Coast region of the United States now are being produced at 100 per cent of their allowables. The projections of demand vs. supply as contained in Volume II of the Draft Statement have already been outdated, and are too conservative. If the United States were now to have a serious interruption in its foreign supplies of petroleum, we could face gasoline rationing here for the first time since the dark days of World War II.

The Draft Statement observes that the one million barrels of shale oil per day which might be in production by 1985 will represent about a 10 per cent increase in the amount of domestic production available in that year. This would make the contribution from shale oil most significant.

There is also the possibility that our domestic production in 1985 might be less than 10 million barrels per day from conventional domestic oil and gas reserves. The draw-down on domestic wells during the last two years has been greater than anticipated, and the projection of our domestic

supplies may be overly optimistic. U. S. production capacity for crude oil and lease condensate was estimated at 10,246,000 barrels daily on January 1, 1972, a drop of 548,000 barrels per day from the previous January 1.

Great difficulties are being encountered by the oil industry in trying to discover significant new oil and gas reserves. The hazards and costs are extremely high, and it may not be possible for our industry to replace the reserves of oil and gas which we are consuming, let alone to add to the rate of production from domestic oil and gas sources.

I might mention that our company is involved in the conventional exploration for oil and gas.

In contrast to the undeveloped oil and gas deposits, our oil shale reserves are already discovered, and their magnitude and other characteristics are relatively easy to measure. Their use is dependent solely upon a favorable economic and political climate, plus the ability of private industry to generate and attract the tremendous amounts of capital which will be required.

Hopefully, the prototype oil shale leasing program will help to prove quickly the viability of an oil shale industry, and to put to rest the fears of many concerning the reasonableness of its impact upon the environment. The Federal government then could move forward rapidly with a full-scale leasing program of its oil shale reserves. This

program could result in an increase in the projected one million barrels per day of production for 1985, and much larger volumes in the years thereafter. In the event the prototype leasing program is successful, there is a possibility of an industry producing three or four million barrels or more of shale oil per day.

If only the one million barrel per day goal is reached by 1985, and if the shale oil is valued at $5 per barrel then, the daily product produced would be worth $5 million dollars which otherwise would be paid to foreign countries. This would result in a reduction in our annual balance of payments deficit by $1,825,000,000. This is a goal well worth working towards.

While the Draft Environmental Statement discusses the adverse effects on the environment from a commercial oil shale industry, it does not dwell in any great detail on some of the favorable impacts that the industry will have on the environment.

One such benefit will be the decentralization of population which will result. The regions of Utah, Colorado and Wyoming in which the oil shale operations will be concentrated are now remote areas with sparse populations. The Draft Statement projects that there will be a mass migration of large numbers of people into these areas as the industry develops. Also, with better job availability, many

of the local people will not have to move elsewhere for employment. This will help to relieve the congestion and environmental problems of the larger cities where these people would otherwise live and work.

One of the major challenges of our time is to find sufficient money to carry on the programs needed to clean up or maintain the quality of our environment. As an example, our Governor and the Utah State legislature are concerned about the pollution problems affecting Utah Lake, the Great Salt Lake, and the Jordan River which connects these two bodies of water. Governor Rampton, at a recent meeting of the Legislative Council, urged that a Jordan River Parkway project be inaugurated to purify this water and beautify the banks along the River. He warned that millions of dollars will be required to accomplish this, but that we must do it despite the costs.

The beneficial effects of an oil shale industry on the economy of this State can help to meet this and other problems which we face.

The magnitude of the financial benefits of an oil shale industry are illustrated on page III-76 of Volume I of the Draft Statement where it states that an oil shale industry producing just 400,000 barrels of shale oil per day would generate total taxes and public revenues of $300 million per year. These would increase proportionately as the

industry grows.

As already noted, the oil shale industry will help reduce the national balance of payments deficit, which threatens to get completely out of control, thus having a salutary effect on the health of the national economy. The balance of payments deficit which will result from the projected importation of up to 17 million barrels of oil per day by 1985 is staggering to contemplate. At $5 per barrel, this will amount to over $30 billion annually. Consider how many of our great social programs, which are geared to improve the standard of life of all Americans, will have to be drastically curtailed and possibly eliminated if we do not take constructive action now to reduce the magnitude of our future energy imports.

For too long now we have been creating new jobs for foreign peoples by purchasing their goods instead of American products. Our unemployment rate has been at intolerable levels and the welfare rolls are swelling. Here is a chance for us to develop a new industry in our country which will help the unemployment problem. When one considers the destructive influence on individual lives of unemployment and welfare reliance, the creation of new jobs by this entirely new industry is most important. We submit that the employment level in this Country is also a part of our total environment.

Utah's economy has become overly dependent in recent

years on governmental and defense-related jobs. Our Governor and others have expended great efforts to encourage more industry to move into our State, but still this over-dependence persists. The new oil shale industry can help.

The United States has been greatly blessed with abundant energy resources. As Assistant Secretary of the Interior Hollis Dole said in Dallas, Texas, last week, the United States has "all the energy resources we need to give us any degree of self sufficiency we desire to maintain." Let us exercise our ingenuity in the utilization of these resources.

The Draft Statement could be studied profitably by every adult citizen of the United States, since the quality of life for each of us is directly dependent upon how effectively we handle the energy crisis facing our nation. All Americans should allow the slogan adopted by the oil companies of America last year to be indelibly imprinted upon their minds, while making the critical decisions which lie ahead. That slogan is:

A Country that runs on oil can't afford to run short.

With that slogan in mind, we call upon the Secretary of the Interior to issue the final draft of the Environmental Statement and to set an early date for the oil shale lease sales. Hopefully, the inauguration of an oil shale industry will help insure that our present energy crisis does not turn

into an energy disaster.

Thank you.

MR. DAY: Give me the title of that document.

MR. ELIASON: The Annual Report of Skyline Oil Company ended fiscal year May 31, 1972.

MR. DAY: Mark that Salt Lake City Exhibit No. 1.

(Salt Lake City Exhibit No. 1 was marked for identification.)

MR. ELIASON: I would like to have my entire statement entered into the record.

MR. DAY: All right. That will be marked Salt Lake City Exhibit No. 2.

(Salt Lake City Exhibit No. 2 was marked for identification.)

MR. DAY: You testified that Skyline has approximately 16,000 acres of oil shale lands and Tosco has many thousands of oil shale acres. The question then is why is it necessary that the Federal government issue you oil shale lands if you already have them?

MR. ELIASON: It is true that we have 16,000 acres of land.

I might explain that these lands are under lease to a colony group of companies and it is expected that some of these will be developed by private industry.

There are two basic reasons why it is important for

this leasing program to go forward.

The first of these is that there are just very few companies that have significant oil shale lands which seem to be amenable to the development in the early stages. That means, as pointed out, and I can't point to the exact place in the statement, but it brings out in there that there are many companies that are effectively cut out of the oil shale development; they don't have an incentive at this point to even work on technology because if they develop the technology they wouldn't have lands to utilize them on. So the reason for this is to make more lands available and so that no company gets a corner on the market on the technology; also to spur the competitive nature of the industry.

The second reason why it is important for the Federal government to move forward with this prototype leasing program is to give the Federal government its many answers. Many answers, for instance, meaning as to whether or not the lease provisions are adequate, whether the royalties are adequate. To get the experience in the department of administering the Federal lands.

As you are aware, the Federal government owns over 80 per cent of the oil shale reserve and about 70 per cent of the total lands.

This is a great resource for our country and can

bring a lot of money into our national life through the royalties and otherwise.

Those are the two basic reasons as we see it.

MR. DAY: Thank you.

That completes our list of scheduled witnesses.

Are there any others present that desire to make a statement? If so, please step forward.

MR. MORGAN: My name is John Morgan, Jr. My address is 709 Walker Bank Building, Salt Lake City, Utah.

Gentlemen, I appreciate this opportunity to appear here today, and I represent the Utah Resources International Company of which I am President.

This company has imported oil shale royalty interest under the Utah state leases owned by Shell Oil Company, Pam American Petroleum Corporation which is AMCO Production Company, and Husky Oil Company in excess of 43,000 acres located in the oil shale reserves of the Uintah Basin in the eastern part of the state of Utah.

May I at the outset of this hearing extend my appreciation for the opportunity of appearing at this hearing to discuss the environmental draft of the proposed leasing act to the Department of the Interior. May I also offer sincere congratulations to the Department of the Interior officials for the objectivity in recognizing the great emergency in environmental problems and challenges before

our country today and our attempt to find the answers to these problems and challenges by seeking these suggestions and advice and support of private enterprise and the states of Utah, Wyoming and Colorado and other interested individuals as well as utilizing the very great talent and background of the personnel of the Department of the Interior itself.

For our own part, we are convinced that our country must find the answers to this growing energy crisis which is before us today. Our energy requirements are so great even at this point, and our projected energy requirements in the years to come are so fantastic that it almost overwhelms us to contemplate oil and gas supplies in order to meet these requirements.

In California alone, for example, there will be in 1975 a 2.2 billion cubic feet of gas per day deficit, shortage. This was testified to by Mr. Howard Boyd, who is the Chairman of the Board of El Paso Natural Gas Company. El Paso, for instance, must find this kind of gas supply in order to meet this huge and growing deficit.

We can buy all this oil and gas -- if this would be our policy -- from the Middle East and African countries, then we know this will ruin our balance of payment deficits and once these countries get us in a position where we must depend upon them, they can then raise the price at any time they desire and we will have to meet that price or it may be

that they could cut us off.

In any event, because it is true that there is a growing Russian influence in the Middle East, for instance, as it is growing every day so in the time of national emergency, we could not depend on the Middle East countries for our own supplies.

Max Eliason gave an excellent report on this, and I feel it should be sustained.

This makes it so important that we propose very definite plans for building a great oil shale industry right in our own backyard where we have the vast reserves of oil shale, in Utah, Wyoming and Colorado.

Part of this program has to do with water resources which we have and this was also referred to by Max Eliason. If we let the water resources go without utilizing them then we in effect abandon those resources. We must put them into productive and beneficial use, and this is why we have applied in connection with the lands that we have, state land in the state of Utah, and we have applied for sufficient water rights to accommodate an oil shale industry in our state.

I am also submitting a map (the map was not submitted to the reporter at the hearing) with my statement which shows, for example, that there are more than 600 billion cubic feet of oil in reserves in oil shale in the Uintah. These come from oil holes drilled by the oil companies and reported to

the Geological Survey, Bureau of Mines.

I have another map which shows the equivalent amount of gas which can be recovered from the oil shale, pipeline gas.

These hydrocarbons can be recovered, you know, with certain techniques which we are in the process of developing into regular oil and gas reserves.

There is as much as 3 billion cubic feet of pipeline gas to the square mile, according to this information that we have received, and it can be converted to pipeline gas. There is this kind of reserve in the ground in oil shale.

These figures have been arrived at through studies which we have employed at the Institute of Gas Technology and in cooperation with the Bureau of Mines and the private industry reports through drilling and so forth. You can see the fantastic potential lying in the ground, lying idol. There is a fantastic reserve of oil and gas contained in the oil shale.

We believe there is one real way that recovering these reserves can be accomplished and this is by a great cooperative effort involving the State of Utah, the Federal government, and free enterprise all working in a cooperative way to develop this great industry.

We have heard from some representatives of free enterprise this morning, but you know there is so much more

from free enterprise that could be heard. We haven't heard from the oil industry this morning, really, and this is who we should be hearing from.

I am convinced if we don't get the oil industry behind this, I don't think it will go far. It takes a great effort with free enterprise the State and Federal government in order for this to go forward.

This very hearing today that you gentlemen are here for is a great example of Federal government showing its desire and effort and energy in doing its part. We are convinced that the very best way to meet the environmental problems which are inherent in the production of a million barrels of oil a day where we have set as an example, for instance, a goal of 2 billion cubic feet a day to meet this huge demand that we developed, and the in situ process recovery program where we can convert the oil and gas contained in the oil shale to regular liquid oil and vaporous gas in places. And, you see, that would go so far in helping to eliminate our environmental problems which you get in such huge amounts if you merely conduct an operation on the surface of the land.

Now, we have been working very hard on the patent to accomplish this purpose and we are working with the best oil companies in America, as I mentioned, to accomplish this objective. We believe it is clearly a possibility. We also

believe that this possibility can be accomplished to secure this kind of industry by 1985.

I might say that we were involved in a law suit with United States Supreme Court and we lost in the Supreme Court; however, if we won, we ourselves believe that it would have been a great step forward in the way of developing an oil shale industry.

We also believe the concept of our proposal is an excellent one. We have the State lands scattered throughout the Federal lands and our idea from the beginning is to invite leasing of Federal lands to surround the State leases and put them together in a total block of some 40,000 acres in a unit and this will give the operating company sufficient land to really project their sites in a total industry.

With Shell Oil Company land, for instance, and the AMCO and Husky land located in proximity to each other and then if the Federal leases were issued in this area and you could then bring other oil companies in, which will have to take if you are going to get the investment, to accomplish this kind of industry. This would be the realistic way to approach this thing in our judgment. But we believe it must take some financing on the part of the Federal government. In our judgment it can't, on the one hand, be done by private industry. This is too huge and undertaking. We believe the Federal government has a role to play here and a formula

must be worked out so the Federal government whose responsibility is to make certain we have sufficient energy in this country to get our energy needs and then we must always have some responsibility of this kind to the industry to help it get off the ground.

This is my statement, and I want to thank you gentlemen for the opportunity of appearing before you.

MR. STONE: Mr. Morgan, the proposed action of your company in which you had an adverse ruling, could you give us a brief description of that?

MR. MORGAN: Well, you see, our thought was if we are really going to develop an oil shale industry we can't do so because of conflicts with oil and gas. Most of our oil shale is located in the ground and when we go down there to work an in situ program for the recovery of oil from the shale, we run into conflicts with oil and gas leaseholders which we think we should work toward developing a lease including all oil and gas no matter how recovered and the Supreme Court -- well, we got legislation through the legislature which we thought would bring this about but nevertheless the Supreme Court held, no, that wasn't the situation. There are two separate things and they should be separated. But we went to the Supreme Court and that's as far as you can go.

MR. DAY: You will present the two maps to the reporter and they will be Salt Lake Exhibits No. 3 and No. 4.

(Salt Lake City Exhibits No. 3 and No. 4 were marked for identification.)

Is there anyone else desiring to make a statement?

MR. FEIGHT: Cleon Feight, commonly pronounded "clean seat" by those in the oil and gas industry.

We would like to submit for the record some rules and regulations adopted by the Board on September 20, concerning the reclamation of oil shale and the Fortuma sandstone. I will put these in.

MR. DAY: That will be Salt Lake City Exhibit No. 5.

(Salt Lake City Exhibit No. 5 was marked for identification.)

MR. FEIGHT: We are of the opinion that this can be accomplished without a bad effect on the environment by proper regulation. We would like to support the statement made by Senator Bennett, Allen, Max Eliason and others in favor of leasing the vital natural resources.

I would like to make one short observation. I notice that you started out in Rock Springs and went to Cheyenne. My only regret is that you couldn't go to Casper where the wildlife people would have you believe that the mining activities will have a tremendous effect on the animal population of these areas. I recently made a trip into Casper and Rock Springs, and I never have seen so many antelope in my life. They were right on the side of the road

watching the cars go by. Everytime we make a trip up to the Book Cliffs, the Kisco area where we have to chase deer off the road. The animals don't enjoy scraping their hides off, and they take the trails that man provides for them.

My last statement is that I think not only the people are overrunning Yellowstone Park, but the bears and animals are doing the same, and I don't know who is afraid, the bears or the people.

(Much laughter.)

Thank you.

MR. DAY: Is there anyone else present that desires to make a statement?

MR. RITZMA: Howard R. Ritzma, Petroleum Geologists with Utah Geological Survey and Chairman of the Committee of Environmental Problems for the State of Utah. I presented this statement yesterday in Vernal, Utah, and I will not repeat it at this time but copies are available for those who wish to take a copy.

This report was a progress report by the Committee on Environmental Problems of Oil Shale.

Item No. 2 is a status of State regulations governing production of oil from oil shale and oil - impregnated sandstone, and this matter has been covered very well by Cleon Feight this morning who placed those regulations in the record. The status of the Utah planned selection in the oil shale

region covered by other state officials this morning, and probable environmental studies in Utah's oil shale region, which was point number 5 of the testimony presented yesterday, and I would like to add that the likelihood that these studies could begin in 1972 or 1973 under the auspices of the University of Utah have been somewhat dimmed by the recent death of the Director of Engineering, but however, the actual status is not known at the present time.

I believe that covers all the points in this report along with the testimony which was presented yesterday.

Thank you.

MR. DAY: Thank you.

Is there anyone else that desires to make a statement?

(No response.)

I would like to remind everyone that written statements from those unable to attend the hearings should be received by the Director, Office of Hearings and Appeals on or before November 7. That has been extended with the appropriate notice published in the Federal Register.

Thank you very much. The meeting is adjourned.

(Whereupon, at 11:10 o'clock a.m. the hearing was adjourned.)

"This is to certify that the attached proceedings before the Department of the Interior in the matter of the Oil Shale Leasing Program, Salt Lake City, Utah, October 13, 1972, were held as herein appears, and that this is the original transcript thereof for the files of the Department.

Cheryl Woods

Cheryl Woods,
Official Reporter
FEDERAL REPORTING SERVICE
991 URSULA ST.,
DENVER, COLORADO 80011

UNITED STATES OF AMERICA

DEPARTMENT OF THE INTERIOR

In the Matter of:	
DRAFT ENVIRONMENTAL STATEMENT FOR THE PROTOTYPE OIL SHALE LEASING PROGRAM.	REPORTER'S TRANSCRIPT

City Hall Auditorium
Fifth and Rood Streets
Grand Junction, Colorado
Friday, October 13, 1972

PURSUANT TO NOTICE, the above-entitled matter came on for hearing at the hour of 9:30 o'clock a.m., this date, before JOHN R. RAMPTON, JR., Administrative Law Judge.

PANEL MEMBERS:

HENRY ASH, Oil Shale Field Coordinator, Bureau of Land Management, Denver, Colorado.

STEVE UTTER, Bureau of Mines, Denver, Colorado.

HAROLD BOEKER, Bureau of Sport Fisheries and Wildlife, Albuquerque, New Mexico.

JOHN DONNELL, U. S. Geological Survey, Denver, Colorado.

I N D E X

P R O C E E D I N G S

JUDGE RAMPTON: This hearing will come to order. My name is John R. Rampton, Jr. I'm with the Office of Hearings and Appeals of the Department of Interior. I've been asked to conduct this hearing.

Those on the panel with me this morning, proceeding from my left, are Henry Ash --he's the oil shale field coordinator, Department of the Interior; John Donnell, U. S. Geological Survey; Harold Boeker, Bureau of Sport Fisheries and Wildlife; and Steve Utter, Bureau of Mines.

The purpose of this hearing is to receive comments on the Draft Environmental Statement for the proposed prototype oil shale leasing program, pursuant to Section 102(2)(c) of the National Environmental Policy Act of 1969.

In accordance with the provisions of the National Environmental Policy Act of 1969, the Draft Environmental Statement was made available to the council on environmental quality on September 6th, 1972, and a notice of availability published in the Federal Register on September 7, 1972.

The Office of Hearings and Appeals, published a notice of public hearing on the Draft Environmental Statement in the Federal Register on September 7, 1972, scheduling the hearing in Grand Junction for today at 9:30. Those wishing to appear were advised to contact the Director, James M. Day, Office of Hearings and Appeals, in Arlington, Virginia.

An official reporter will make a verbatim transcript of the hearing. All matters spoken while the hearing is in session will be recorded by the Reporter. So that there will be an accurate and complete record of the hearing, it is essential that only one person speak at a time. While the hearing is in session no one will be recognized to speak other than the parties who wish to present a statement.

I'd like to make it clear that this is not an adversary proceeding. The participants presenting their views will not be sworn nor placed under oath. There will be no examination or interrogation of the witnesses except by panel members, and that only for clarification. The participants will be called in the order shown on the list that I have here.

Now, if there is anyone not on this list when we finish with those speakers who have already registered, I will ask for a show if there's anyone who wishes to speak, and I think we'll have plenty of time. I am not going to make a strict limitation of time for each speaker to present their case, however, if it becomes necessary, I will indicate that you're taking too much time and ask that you present what other matters that you may have in written form.

I would like to express two points. The presentation to be relevant and supported by pertinent data. If any comment is directed to the Draft Environmental Statement, refer to the applicable pages of that Statement. And if

information is quoted from technical or scientific journals, or any other publications, please give the name, the author, and the page number and the date on that publication.

At the conclusion of the oral statements the participants may submit written statements. The statements will be marked as Exhibits. I don't wish to receive, however, the written statements if they are duplicates of the statements you make orally.

It would be helpful to the Reporter if we could obtain copies of prepared statements, so when you approach the stand if you have a copy of your prepared statement, would you give it, please, to the Reporter? And if you have an extra copy, she'll, I think, appreciate having those copies when she prepares this transcript.

Written comments from those unable to attend and from those wishing to supplement their oral presentation at the hearing should be received by the Director, Office of Hearings and Appeals, at the address previously stated on or before October 23, 1972, for inclusion into the record.

A transcript of this hearing will be prepared and the Final Environmental Statements will reflect the comments of this hearing, where appropriate. The record will be available for public inspection at the Office of the Oil Shale Coordinator, United States Department of the Interior, Room 700 Interior Building, and the Office of the Director, Office of Appeals

and Hearings, 4015 Wilson Boulevard, Arlington, Virginia. Copies of the transcript may be obtained by making arrangements with the Reporter. Copies of all written statements can be obtained by making appropriate appeal to the Office of Hearings and Appeals.

The Director has asked me to express his personal thanks for the time in this hearing spent by people who have been involved and will become involved and the members of the panel. All of the comments will be carefully considered by the Bureau in accordance with the applicable provisions of the National Environmental Policy Act of 1969.

I would also add that if there's anyone present who has not registered in the lobby or the foyer, would you do so before you leave, please?

We'll call the first participant on the list, the representative of Sun Oil Company of Dallas, Texas.

MR. BUCHWALD: Mr. Chairman, panel, ladies and gentlemen. I am R. W. Buchwald,Jr, Manager of Recovery Research. I came to Grand Junction to comment, for Sun Oil Company, on the Draft Environmental Statement for the proposed prototype oil shale program.

My comments today are, for the most part, a reiteration of the statement our president, Mr. R. E. Foss, made on October the 10th on the Denver hearings.

The three-volume draft has been analyzed by Sun staff personnel who have been working on the oil shale study.

This statement today gives briefly the views and position of Sun management, based upon that analysis.

We request permission to file a more detailed statement, with references to pages, and with suggestions for changes in language, before the record closes in order that the more detailed suggestions be included as a supplement to this statement.

First, we would like to acknowledge the impressive and expensive research that went into preparation of the Draft. The people in Interior whose work and expertise went into compiling the impressive statement certainly are to be complimented.

Secondly, I assure you that Sun Oil Company supports the premise that a prototype program affords the best hope for achieving the goal of providing for the United States this new source of energy in a time frame that is early engough to be of benefit with a commercial technology which will permit the development of private enterprise in a manner which will afford a minimum impact on our environment.

Sun Oil Company recognizes its environmental responsibilities and has no quarrel with the pure environmental conclusions of this Draft Statement. We are actively evaluating our participation in the proposed program.

As a responsible member of many communities in which we operate, Sun Oil Company constantly strives to conduct its

activities with concern for the rights and well-being of others, including its neighbors and all citizens. Our potential participation will be in keeping with our ruling -- not only to comply with all air and water pollution and land use laws and regulations, but also to adopt every reasonable measure for the protection and conservation of air, water, and land resources in the production and processing, and marketing of all of our products.

However, we must point out our serious doubt that the envvironmental impact statement, the true economic perspective when they touch upon prices and rates of return and upon expenditures for investments and operating costs, which will include items for conservation and reasonable land restoration.

For example, in Volume I under the captions "Environmental Impact," there is a discussion which includes statements that: A minimum -sized complex would produce 50,000 barrels a day or possibly as high as 100,000 barrels a day. The capital investment required would be from $250- to $500-million. a rate of return of 10 to 13 percent is anticipated. Calculations are based on an assumed oil price of $3.90 per barrel.

Not only must economic factors be considered, but also be realistic in our considerations. There must be a balancing of such considerations as the revenues from the oil, the rate of shale to be processed, and the extent of land

restoration required. Sun has had a pretty thorough introduction into the problems of recovering oil from tar sands, and we believe that experience is useful here.

On the basis of that experience we have reached these conclusions: A facility capable of recovering 50,000 barrels of oil per day from the shale would be tremendous earth handling operation. Such an operation could be called minimum only in the sense that nothing smaller would have much chance of being considered commercial.

A range of $250 to $50-million is an extremely soft estimate. On the basis of track records, it is safe to say that such estimates of capital requirements usually prove to be on the low side.

As indicated in the Environmental Statement, a 10 to 13 percent rate of return would be acceptable, but investors supplying the $250- to $500-million of capital would need some assurance that such a rate is attainable after allowing for the unforeseen costs associated with developing a new process. It must be remembered that the investors in this prototype program cannot rely upon recoupment out of future plans or leases. The prototype investors have no assurance they will ever get another oil shale track.

No basis is suggested for the assumption of an oil price $3.90. It is not clear from the Environmental Statement what this price is expressed in terms of today's

dollars or future dollars. The oil that will be produced and sold from shale is many years down the road. We are not prepared to guess what the price of oil or the value of oil will be at that point in the future. It is our opinion that the prototype programs would not be commercial unless more revenues are generated for the programs than would be derived from the sale of oil at $3.90 per barrel in terms of today's dollars.

We note that Volume II devotes considerable space to the relation of oil imports to the future of oil shale. There can be no question about there interdependence. Furthermore, for the short term there seems to be no choice than to utilize foreign oil to make up the deficiency between domestic demand and supply.

The danger is in allowing our future dependence on foreign oil to reach unacceptable levels -- certainly not the levels of over 40 percent in 1985 as projected in Volume II. We simply must find the best way to make imports work for the solution of this nation's energy crisis.

We were gratified to find in Volume III a recognition that the lease bonus itself constitutes an undesirable economic burden on the development. While spreading of the bonus over several years will help, the fact remains that capital paid out for bonus still is capital not devoted to developing the prototype programs. I don't know what the Government might

be required to do with this bonus money, but certainly a logical use would be to find a way to plow it back into the shale oil program.

In his connection, Interior's mention of possibly crediting extraordinary environmental costs against royalties against these prototype programs is a step in the right direction. Certainly there are other powers which the Secretary has under existing law, or might obtain under future law, to assure the progress of the needs but very expensive oil shale prototype programs. We believe the welfare of the nation requires it.

Thank you for the opportunity to express Sun Oil Company's views on this important matter. Copies of our statement are on the table at the rear of the auditorium.

JUDGE RAMPTON: Mr. Frank Cooley.

MR. COOLEY: Mr. Chairman, members of the panel, ladies and gentlemen. My name is Frank Cooley. I live in Meeker, Colorado. At the present time I am chairman of the Oil Shale Regional Planning Commission. This Commission is headquartered in the Rifle, Colorado, and comprises the three counties of western Colorado containing the oil shale deposits of the Green River formation -- Mesa County, Garfield County and Rio Blanco County.

The Planning Commission was organized a year ago

to coordinate the efforts of the three counties, to provide a clearing house of information about development in the three counties, and to assist the counties in their planning efforts.

The Oil Shale Regional Commission is charged with the responsibility of one of the four studies taken jointly by industry, the Federal Government, and the State of Colorado, a study into regional development and land use. This work is progressing under the three contractors who are professionally competent and capable of developing information and data necessary for local government to make proper decisions. The study will be completed in 1973.

Each of the counties has a planning commission. In addition, the principal towns of the three counties have active planning commissions. Mesa County has a particularly active and well-staffed city/county planning commission. The resources of the agencies are each limited and the pressures are increasing rapidly as a result of building of Interstate 70 and of the boom in recreation land in Western Colorado. The economies of the three counties have not been dynamic. In recent years the characteristic of towns in Western Colorado is the loss of population.

At this point, let us turn to Genesis I-III-85, and if Ijust may read a paragraph. "The inadequacy of housing during the construction period especially may result in additional detrimental effects. The first effect would be

overcrowing of existing facilities, possibly creating health and safety hazards. Secondly, disproportionately high rents may also occur. This could affect the worker turnover rate. It is also expected that many of the workers, both construction and production, will bring mobile homes into the area. This could result in 'shanty town' type developments; however, the regulations, the planning commission have established will probably avert this development." It was scary there for a minute.

Many of the burdens of an oil shale development will fall upon the local governments. We hoped and still do hope that by coordinating the efforts of the local governments, by study and planning, that we may be ready in some measure to control the development of the land and to control some of the impact and industry on the local environment and our way of life.

While progres is being made, the size of the task, the pressures of time, and the limitations on the ability of local government adequately to protect Western Colorado are now causing us concern. We have real fear that we may not exercise the degree and maturity of effective local control that is essential if we are to have development on the scale planned.

The problem which is of the greatest concern to me is the apparently limited ability and the slow pace of local

government to deal with rapid expansion and development and with the large pressures of people and money that are arising in Western Colorado -- even absent the pressures which would be or are being created by the leasing program. That is to say, we have problems this minute, prior to any oil shale developments that are taxing our abilities and our resources. Specifically, the one impact of which I have greatest fears, and one that is not dealt with at all in the Draft Statement, housing in the area. Today there is safeguards with respect to water pollution, air pollution, and the impact of an extractive industry upon the public domain. There are studies underway on the eco systems, on the bird life -- the hump-backed chub -- and on the fishing in the Piceance Basin. At this particular time the impact which seems most fearsome to me is not the impact on air or water or on the fishing or hunting or wildlife, but the impact on the way of life in these communities. The housing particularly presents to me greater problems than any others facing the people in this generally sparsely populated region. If the corollary of the leasing program is the inevitable importation of 10,000 house trailers, then I fear that the quality of life in this part of the state will be destroyed.

I believe that there has been a tacit assumption on the part of the Interior Department -- and, of course,

this statement on Page 85 -- but the activity of the regional planning commission and the counties would be of sufficient vigor and quality that these problems are being solved on the local level.

I hope that they can be, but there is no assurance of this today. Pressure has been brought on Garfield County, for example, to proceed with the utmost hast to complete the zoning of all of western Garfield County which lies along the Colorado River. After the delay of more than a year, the zoning has not been done but the pressures and the dangers are extreme and the resources are limited. The situation with respect to mobile homes in Uintah County, Utah, where the commissioners got up to a count of 700 and then stopped counting, is an example of the problem. They, of course, have an oil boom going on over there which is independent of the development that is now going on, and each week the problem is bigger.

One of the most unfortunate limitations in the fact that people in this area have been promised an oil shale boom by next month for the past 54 years, and they have become callus to each new increasing wave, just as they are somewhat skeptical of the question of whether the leasing program or the activities of the Colony, for example, will trigger a full-blown industry.

In my judgment the Draft Environmental Impact Statement has been thoughtfully prepared with a great skill and judgment. A tacit assumption has been made that the local governments would be capable adequately of handling the municipal governmental and housing problems associated with such a development. My testimony at this time is that, although we are making great efforts in this direction and are attempting to be ready for the problems, it is not clear now that we will see and that we will have adequate safeguards in time.

The regional planning commission has had the complete cooperation of the Department of the Interior in requests for assistance for guidance as well as for cooperation from each of the major companies active in developing shale. It is also true that the companies most interested in the development of shale have each expressed, usually privately, almost as much concern about the problems of housing and trailer houses as I have expressed here this morning. There are means within reach of the local communities to afford adequate safeguards for the preservation of the local way of life, but there are also handicaps of inertia, of the problem, to cite the outstanding example, of dealing with mobile home developers, salesman, and the land developers.

To summarize and sharpen these remarks, I suggest

the following: No 1. The statement should be amended to define the impacts on housing and upon the communities. It should not wait for the studies now underway.

No. 2. Massive Federal and industrial help in a variety of forms will be necessary to avoid destruction of the quality of western living.

No. 3. Particularly local government is facing a great challenge. I want to add parenthetically at this time, as I read this statement, I was struck with a horrifying thought that someone might think of the State of Colorado would anticipate this. If anything is clear, it's clear that isn't the source of the answer we need from our experience in the last 14 months.

No. 4. And finally, the challenge can be met but not at the present rate, not with the present effort.

Thank you very much. The staff chairman of the planning commission is here and he wishes to make a statement at a later time, this morning.

JUDGE RAMPTON: Thank you, Mr. Cooley.

We have next listed a representative of American Petrofina Company of Texas.

MR. MORAN: Mr. Chairman, members of the panel, ladies and gentlemen. My name if John R. Moran, Jr. I am an attorney practicing in Denver, and I appear here today on

behalf of American Petrofina, Incorporated.

American Petrofina was organized in 1956. It is a publicly held corporation with stock being traded on the American Stock Exchange.

The company is engaged in two principal lines of business: Energy products and petrochemicals and plastics. The energy products division is operated by American Petrofina Company of Texas, which is responsible for exploration and production of crude oil and natural gas and for refining and distributing conventional refined products. American Petrofina markets its products principally under the FINA brand in 24 states, including Colorado, Utah, and Wyoming.

FINA has oil and gas production in the States of Texas, Louisiana, Arkansas, Oklahoma, Kansas, New Mexico, Wyoming, and Colorado.

The company's chemical and plastic division is operated by Cosden Oil & Chemical Company, a wholly-owned subsidary, which manufactures petrochemicals, polystyrene and polyethylene emulsions and which markets under the COSDEN brand. COSDEN also licenses others with respect to certain of its proprietory manufacturing processes.

For some years, American Petrofina has been a leader within the energy fields industry in the installation of facilities at its refineries to effect air and water pollution control. For example, during the early 1950's, at

its Big Spring, Texas, refinery, FINA was probably the first to utilize the treated effluent from a municipal sewage plant as a water source for a refinery operation.

By using air cooling techniques in the refining processing industry, FINA has effectively reduced its process water requirements for its refineries.

Several years ago, acting on its own initiative, and for the purposes of achieving higher air quality, FINA installed the sulpher recovery facilities at its Big Spring and Mount Pleasant, Texas, refineries where the company processes what is known as sour crude.

Since 1968 FINA has installed a system for treating water and removing sulpher, particulate matter, and smoke from the vapor effluent streams from its refineries.

In 1970 FINA developed a secondary use for refinery waste water from its Big Spring, Texas, refinery. By filtering and refining its waste water and pipelining the reclaimed waters from 30 miles, the water is now able to be used in secondary recovery operations to increase the efficiency of oil recovery from oil fields in the area.

Notably, as air and water pollution control technology has developed over the past several years, American Petrofina -- with approximately 8/10ths of one percent of the nation's refining capacity -- has averaged the expenditure of approximately $1-million per year to effect air and water pollution control.

This background and the examples of FINA's efforts with respect to air and water pollution control, and its application of such controls in an area of limited water availability, show a company concerned with the environment and the prevention of waste.

For at least the past ten years, American Petrofina has been interested in the development of synthetic fuels from either or all -- tar sands, coal, or oil shale -- as a means to meet the increased energy demands. It's interest in these fuels, together with an ever increasing awareness of probable energy resource shortages, led the company to retain in 1967 the services of engineering consultants in Denver to assist the company in becoming fully informed of the potentials and the problems in development of an oil shale industry.

Based on the engineering information provided by its consultants and other data developed by the company itself, and including information gathered with other interested companies in an authorized core drilling program in the Piceance Creek Basin as well as the result of an environmental investions in that area funded by FINA, and others, which investigations, by the way, are still continuing -- American Petrofina has concluded that the development of a shale oil industry should commence, and with known and available technology can commence.

The Environmental impact statement before this

panel, particularly Volume II, Pages 8 and certain following pages, substantially document the nation's present and future energy requirements. If one is to believe the forecasts in the Statement, and there is no substantive evidence that they are not true, the nation will be faced with an energy crisis.

In applying for a lease of Federal oil shale acreage, the oil industry -- of which American Petrofina is a member -- is seeking to avert that crises. And if the crises is not apparent, as some may suggest, it is now time while we may yet have time to proceed at a measured pace to develop oil shale as a reliable energy source, but with due consideration to the alternatives, and with an intelligent attitude towards the environment and its protection.

Some argue that the technology for an oil shale industry is not yet available. A review of available literature, and the Impact Statement in particular, would lead one to conclude that the technology is available.

Some admit the existence of a technology, but urge that nothing should be done to develop oil shale because of possible adverse effects upon the environment. The advocates of this view ignore the repeated declarations by the oil shale development particpants that they, too, have a protective attitude toward the environment.

From the testimony presented at Denver -- the Denver hearing on October 10, 1972, and from the viewpoint I express,

it is to be expeected that the participants will do their utmost to use all reasonable and necessary means to assure such protection as is exemplified by the awareness of American Petrofina in the implementation of pollution control technology in its own operations.

Others argue that oil shale development, if it is to proceed at all, should be limited to private lands. That view fails to take into consideration that a substantial portion of the Federal acreage has deposits of high oil shale, has probably less overburden, and, under the proposed leasing trend, could become available to participants capable of undertaking development, but who would otherwise be denied the realization of their capability if they had to acquire private lands.

Significantly, reliance on Federal oil shale lands involves participation by industry and by government toward a common goal and with greater assurances that the interests of all will be protected. These assurances will come by way of stipulations which are to be made a part of the lease agreement if and when the leases are issued; but most important, a condition to even submitting a bid for lease requires that those desiring to participate to submit a plan of development for the prototype or pilot period and for each subsequent stage of development, and these plans will most certainly be scrutinized from all points of view.

Arguments have been presented to the effect that the whole concept of oil shale development is premature, that industry and government are guilty of hasty action, and that before anything else is done further studies should be undertaken. These arguments miss the point. The matter presently before this panel and the public is not a full oil shale development program. What is or should be under consideration is the justification for a prototype program. It is through the prototype program that information will be gathered and evaluated, thus providing the future study urged by some opponents. It will be through the prototype program that the feasibility of a full scale development will be learned, thus avoiding hasty action. It will be through the prototype program that the long-range problems are identified and solutions found.

If industry cannot or does not act to serve the best interests of all, the presence of the Government from the inception of the program, assures the protection of the public's interests. The prototype program has not been conceived to determine what the shale oil is producible because it can be produced. The essential function of the prototype program is to provide us with the knowledge of the most appropriate way to produce shale oil and to provide us with management techniques for the effects of its production.

American Petrofina's here today to support the proposed prototype oil shale leasing program. It recognizes the need for oil shale as an energy resource and reconfirms its own conclusion that the development of this resource must commence. It is cognizant of numerous development problems and their possible effects on the environment. These obstacles notwithstanding, American Petrofina Company is continuing to treat its own capabilities to meet the problems. It affirms its interest in seeing the program through to successful development from which all can benefit.

On behalf of American Petrofina, and in closing, I wish to convey the compliments of American Petrofina to the United States Department of the Interior and its staff on the comprehensiveness of the environmental statement. It reflects what others have said, and I'm not original in those remarks, but it's true. It reflects the expertise of those involved and the concerns we all share as responsible citizens.

Thank you.

JUDGE RAMPTON: Thank you, Mr. Moran.

Mr. Russ Cameron.

MR. CAMERON: Mr. Chairman, panel members. I have a rather lengthy prepared statement which, with your permission, I will submit for the record and paraphrase in my presentation.

JUDGE RAMPTON: All right.

MR. CAMERON: Also, before the deadline for

the submittal of additional comments, we will provide a fully annotated amplification of this statement.

I'm Russell Cameron and I represent Cameron Engineers of Denver. Our organization has long been associated with attempts to develop oil shale. We welcomed this opportunity to present our views on the Portotype Oil Shale leasing program.

The Department is to be commended for its thorough treatment of the environmental consequences of oil shale development. Not only are the impacts of a prototype leasing program detailed, but the statement provides a projection of the environmental effects of a mature oil shale industry at a point many years in the future. Since the purpose of the prototype program is to provide guidance for the ultimate development of the resource, a glimpse at the impacts of largre-scale production is useful, even though difficult to visualize at this point in time.

The need for oil shale is well-documented in that portion of the statement dealing with energy alternatives. However, our own studies of the energy posture of the United States do not lead us to be as optimistic as some sources quoted regarding the potential for domestic oil or our continued access to foreign petroleum on an acceptable term. We, therefore, attach more urgency to the program and the subsequent commitment of the significant levels of shale oil

production than I interpret from the Statement.

I cannot agree, for instance, with the suggestion in the report, Volume II, Page 27, that our "Indicated reserve plus undiscovered resources producible with current economics and technology" total 417-billion barrels. The qualification "once they have been found" contradicts the implication that current economics apply. This figure is pure geological speculation and has little relevance to the period under consideration. The Department's own projections and those of others indicate that we probably will be unable to maintain even current levels of oil production over the next 15 years, and this is what is relevant.

Regarding imports, because of the long lead-time needed to develop any of our large new energy resources, we seem inevitably to turn to imports of oil and gas as the only immediate solution. The statement clearly points out the hazards of this course. It is my personal opinion that we will be denied much of our present access to imported fuels within five years by a combination of economic and political factors. In this regard, the Rocky Mountain area -- Colorado, Utah, Wyoming, and Montana -- has long been an exporter of oil to the rest of the nation. However, oil production, despite increased exploration, has peaked in 1961 at 693,000 barrels a day. It's the largest production figure on record for the states. Today production is about 650,000

barrels a day and is declining. The State of Colorado reached its peak production in 1956 at 160,000 barrels a day, and today production is less than half of that, and most of the decline has come from diminishing production in the Rangely Field. Over the Labor Day holiday there were spot shortages of gasoline in Denver. On October 8th there was an announcement in the Denver Post of a $20-million 80,000 barrel per day products pipeline from Denver to Kansas. Industry sources have already noted that pipeline connections are being made to bring foreign crude to Oklahoma and Kansas refineries; thus, the Rocky Mountain crude oil will soon -- I mean, Rock Mountain area markets will soon be using products produced from crude oil that originate as much as 10,000 miles from the area it serves. You people in Grand Junction will be burning gasoline that originated in Saudi, Arabia.

Another area which is becoming somewhat critical is the source of energy for our electric power and our gas supplies. In Denver the other day I believe there was a young lady who suggested that if we are running out of oil we ought to use electricity -- it was cleaner anyhow. Sort of reminds you of during the French Revolution of a certain lady suggesting if you were out of bread you ought to eat cake.

Oil shale could have a very beneficial impact on our supplies of clean fuels or electricity or gas. Shale oil can be refined into a clean-burning, low-sulpher fuel oil. A

coal product of that operation will be a light naptha that can be converted into a substitute for natural gas. This shale oil can be a factor in the solution of oil shortages, of electricity shortages and gas shortages throughout the nation, and a solution to their environmental problems.

The Department, in its treatment of the environmental factors of oil shale development, we believe have gone a little bit too far in being cautious and being even-handed in some of its assessments. For instance, the implication is given that a change of land use from the primarily agricultural areas, stock grazing, wildlife, and so forth, is bad. It's my contention that changes in land use are not all that bad. Considering that over-grazing and unrestricted access by vehicles has caused severe erosion throughout the oil shale area, a well-controlled oil shale development should bring about a measurable improvement in watershep protection and the ability of these areas to support wildlife.

We also believe that the impact on the local communities can be beneficial. As was pointed out earlier, the economy and much of the region has been declining for some years. The tax base, payrolls, and job opportunities should stimulate those communities.

Let me point out also that the importation of 1-million barrels per day of crude oil from overseas is essentially exporting 48,000 jobs. The report suggests this

million-barrel per-day industry would employ some 48,000 people.

It also suggests that the investment will be as much as $5-billion. That is $5-billion worth of tax base that we also export when we import a million barrels a day. It seems to me overall that the economic affect of shale development is a very powerful factor and must be balanced against any necessary and unavoidable environmental impact.

Health and safety, which was a subject of a rather emotional presentation in Denver the other day -- health and safety should be improved in oil shale plants and mines built to contemporary standards; and in any case, should not be compared to coal mining. The copper industry is more akin. Fatalities in the mining, milling, and smelting of copper for the entire country averaged 21 per year, the years 1967 to 1970. It is completely fallacious in my mind, as suggested in the Environmental Statement, to even suggest that 1,100 deaths would result from oil shale mining by 1985 when an entire industry only has 20 deaths per year, and this industry, by the way, mines and mills or disposes of almost 1-billion tons per year of ore and overburden.

Going on to factors which I'll mention later on, we think it unlikely that shale oil products in the three-state area will exceed the 400- to 500-thousand barrel per day range by 1985. Therefore, the magnitude of the impact would

be only one-half of that estimated in the environmental statement for 1985.

Another point that we take some exception to is the suggestion that an oil shale industry is going to foul up the Colorado River and its tributaries. The salinity increase factor is a very emotional one and we think should be put into its proper perspective. The discharge of low-quality water, whether it be contaminated run-off,waste water from retarding or upgrading plants, or excess mine water into surface streams, will happen. Legally these waters must be controlled. Otherwise there will be no oil shale industry. Actually, any of these low quality-waters will be used for solid waste disposal as was pointed out in the statement.

The other source of contamination that is suggested, that because good water will be removed from the Colorado River high on its drainage, that it's dilution effect on the lower Colorado will cause an increase in salinity at Hoover Dam and below. A report issued in 1971 by the Environmental Protection Agency, United States Environmental Progection Agency's Regions 8 and 9, the mineral quality problem in the Colorado River Basin, summer for 1971. This report shows that 66 percent of the salt load at the Hoover Dam is caused by natural sources, 33 percent by irrigation, and only one percent by existing municipal and industrial uses. The present concentration of salt at Hoover Dam averages 730

milligrams per liter. The increase called by a million-barrel per-day. Oil shale industry is estimated by the Department to range from six to ten milligrams per liter. By contrast, the salinity in the river increases to about 870 milligrams per liter at Imperial Dam below Hoover Dam, and is over 1,100 milligrams per liter as it flows into Mexico. Most of the 400 milligrams-per-liter increase below Hoover Dam is caused by agricultural practices in Arizona and California. Compare this to six to ten milligrams per liter that's suggested to be the maximum increase in salinity that could be called by the shale oil industry.

I'd like to comment on another misconception that I hear from place to place. This is the suggestion that this program should not go forward until the completion of all of the various studies that are being conducted that relate to environmental impact. Specifically, the studies that are being sponsored by the State of Colorado, the Federal Government, and industry, the $715,000 four-part study.

I'd like to point out that these studies are to be completed within two years. A lessee who receives a lease under this prototype program must submit his detailed plans three years earlier. So these studies will be completed prior to the time that the detailed plan of the lessee is submitted to approval.

I'd like to finally comment on one other aspect of

oil shale development, especially as is projected in this study. In its treatment of alternatives and of the environmental impact of large-scale production, the Department has presented convincing evidence of the need for an energy input on the order of a million barrels of oil today. My concern is that under present conflicting policies and actions by Government, this target will not be reached. The prototype leasing program, although essential, is only one small step. 20 50,000-barrel-per-day plants, must supply in excess of 5-billion barrels. This is unlikely to be done in the shortened space of 12 years. If it is in the national interest to obtain a million barrels per day of shale oil, and I believe it is, then there must be a national goal to do so. Such a goal should be a part of a national energy policy that provides for the use of secondary energy resources before primary resources are exhausted. To do this by 1985 we must rapidly accelate the time to acquire fundamental, environmental, technical, and economic data. To do this there will need to be a sharing of the risks and the costs by industry and the government.

But this statement is not directly to the subject of this inquiry, it seems to be basic to the development of the use of shale oil. Unless we are prepared to solve the other problems that face oil shale, there is little benefit from an effort to find means to ameliorate environmental

impact.

I'd like to finally conclude by reiterating that this program had adequate safeguards. If the lands for which leases are issued during this program could not be developed in a manner consistent with environmental integrity, no development would occur and no further leases would be issued until environmental protection could be assured. Industry knows these conditions and we believe it is willing to accept them.

We urge the Secretary to proceed with the program as defined in the Draft Statement without delay.

JUDGE RAMPTON: Thank you, Mr. Cameron.

We have next on the list a representative of the Aspen Wilderness Workshop. Is there anyone present in the auditorium who represents the Aspen Wilderness Workshop? Mrs. J. W. Rogers?

MRS. ROGERS: I am representing the Aspen Pitkin County League of Women Voters, and the Grand Junction League of Women Voters.

Because of the difficulties citizens have had in obtaining a copy of the Environmental Impact Statement, and because of the length of the statement, we have had a difficulty in examining it properly in the time that it has been available to us. We request that the comment period for these hearings be extended at least 30 days beyond October 23rd.

We are also particularly concerned about the Western Slope, and in view of the fact that the Draft Environmental Statements admits that the development of an oil shale industry would have a major environmental impact on the regions to be developed, we wonder if the United States should enter into a full-scale oil shale leasing program either a state or national land use plan has been developed. How will the neighboring communities cope, financially with the impact of the sudden increase of population? Also, what will be the impact on the human resources? Have these things really been fully evaluated?

We are also equally concerned about the water resources. We want to know, is the 160,000 acre feet of water projected to be used annually, will that actually be totally consumed? Who will be responsible for overseeing the erosion control facilities, also the salinity control, and other environmental impacts over the long range? And who will be financially responsible for them? Also, does this amount of water include water for the domestic use which will be needed for the tremendous increase in the population growth?

We have noted in the Draft Statement that up to 340 tons of sulpher oxides, 120 tons of nitrous oxides, and 40 tons of fugitive dust and particles will be admitted daily under full operating conditions. We wonder how these daily emissions will affect the quality of the air, particularly

on the Western Slope, and how the developing industry plans to meet the air quality and emission standards which are set by the State of Colorado? Has the total impact on our air from the present and projected power plants in the Four Corners area and in Wyoming and in the oil shale development here, have all of these together been computed?

We urge you to seriously consider all of these factors that we have mentioned, and also to extend the comment period another 30 days so that there may be more citizens' input.

Thank you.

JUDGE RAMPTON: Thank you, Mrs. Rogers. Your request will be considered by the panel and transmitted to the Director.

MRS. ROGERS: Thank you.

JUDGE RAMPTON: We have next from the list a representative of the Board of County Commissioners, Rio Blanco County.

Mr. BRENNAN: Mr. Chairman and members of the panel. I'm Bill Brennan, chairman of the Board of County Commissioners in Rio Blanco County.

The Board of County Commissioners at Rio Blanco County supports the development of the Oil Shale Reserves located in Rio Blanco County. Over the years, the Board has cooperated with all Federal and private projects in working

towards the development of the shale resources. The County has expended over a million dollars in developing a paved road along Piceance Creek along the heart of the shale to aid in this development.

The impact of the development of a shale industry in Western Colorado and the economy of Rio Blanco County would be substantial. As the Draft of the Environmental Statement shows, Rio Blanco County has the highest per capita property tax receipt of the three counties involved. The report also indicates that Rio Blanco County has the lowest unemployment rate in 1970, well below the national average. Both of these figures somewhat distort the actual situation.

The principal taxpayers in Rio Blanco County are the major oil companies involved in the Rangely Oil Field and the Wilson Creek Oil Field. We believe the actual income of the average Rio Blanco County resident is below the national average. The low unemployment rate is due to the large road and bridge crew employed by Rio Blanco County. The decline of agriculture in the United States has not helped matters any, and development of a shale industry in Rio Blanco County would produce a substantial boost in our economy.

The Board is deeply concerned over the environmental aspect of the development of a shale industry in Rio Blanco County. Most of the residents of the county live there because they like the way it is. They like the clean air, clean water,

the small town and rural pace of living. We recognize that we cannot have our cake and eat it, too; however, we feel that the problems of clean air and water can be handled through restrictions and requirements placed in the Federal leases when they are issued.

We also recognize that development of a shale industry will produce an influx of people into our county which will have a direct affect on the manner in which we presently live. We are already seeing changes along these lines as a result of the development of the recreational potentials of the White River Valley.

The Board supports and prefers the development of oil shale by private industry rather than by the Government. The report is misleading in that it implies that the royalty payments by the Government for governmental development of the shale would go to the various counties involved. In fact, a substantial portion of this money would be cut off by the State of Colorado by virtue of a statutorily imposed limit which limits the county share of the royalty payment to $200,000.00. The county would then be expected to maintain the roads, provide the schools, and provide all the other necessary essential government services to the workers who move to the county to develop the shale, without receiving adequate revenue to meet these increased costs. Private developers would, in fact, pay their fair share of taxes

to the county to cover the costs of the needed services and facilities.

The Board of County Commissioners of Rio Blanco County will continue to cooperate with and work with any Federal or private project whose aim is the development of the shale resources by private industry, provided that such development is done in such a way as to reasonably insure that the quality of the air and the water resources of the county will be kept at their present level.

I thank you.

JUDGE RAMPTON: Thank you, Mr. Brennan.

We'll take a short recess. I'll ask that you be back in your seats at ten minutes to eleven.

(Whereupon, a short recess was taken.)

JUDGE RAMPTON: If there's anyone who has not signed the register in the front foyer, will you please do so before you leave?

We'll now have a representative from the Colorado Rivers Council.

MR. SCOTT: Mr. Chairman, my name is Tam Scott, and I'm the executive director of Colorado Rivers Council. And I have a letter here directed to the Department of Interior and but for a typographical faux pas, I would have had copies available for the Reporter and other people, and I would be glad to make them available. If anyone's interested in

receiving copies of this, they should talk to me, Box 1815, Aspen, Colorado, 81611. I'd be glad to send them copies of these draft comments and any other comments of which our organization sees fit to come up with during the next few weeks on this matter of the statement.

So, without any further ado, I'd be glad to read this letter and send you, Madam Reporter, a copy as soon as I can get it.

Gentlemen, thanks for placing us on your public hearing list and sending us the above-mentioned three volume draft statement, which I received at the start of this week.

The following comments are made for and on behalf of the directors of Colorado Rivers Council. I have not had sufficient time to review your statement and these comments with the directors. We will try to do this within the month. Accordingly, for the record, please accept the contents of this letter as draft comments.

By way of background, Colorado Rivers Council is a Colorado non-profit corporation comprised of a membership of about 500 persons from Colorado and elsewhere around the country. Original incorporation papers were filed with the state on September 22, 1972, for Eagle Piney ater Protection Association. This September the directors amended the articles changing the corporate name to Colorado Rivers Council.

CRC is primarily an environmental organization

working for, among other things, the protection of natural, free-flowing rivers in the high country because we feel are vital to the state's economy, and environment, and cultural heritage, and well-being.

For obvious reasons, the proposed oil shale development, with its predicted water resource requirements, and other associated impacts -- poses a serious threat to the water and the environment of the West Slope country, hence our interest in making these comments.

With these thoughts in mind, here are a few observations on the draft statement and our requests to Interior to revise its approach to oil shale.

The first section of comments refers to the restriction of the proposed action and the environmental impact thereof -- that general section in the statement.

Though thick in form and interesting to read, the statement is woefully lacking in specific information and analysis as to predicted water requirements and available supplies for a developing oil shale industry.

First it states that "water resources of the area are complex and varied . . . and requirements for an evolving oil shale industry will change with time," at III-24, Section 3.

Then, rather positively, it states that approximately 25,000 to 40,000 acre feet a year of Colorado River water will be required to develop 250,000 barrels per day under

the prototype leasing program; and anywhere from 80,000 to 160,000 acre feet for the projected development of a million barrel a day industry by 1985, if everything goes according to schedule.

Further, it is stated that major water requirements for surface waters may not be needed over the first 25 years of operations. Yet, elsewhere it is suggested that supply, suitability, and environmental problems associated with the use of ground water from mines, et cetera, may well be insurmountable, and that construction of dams and resevoirs will be necessary to assure a dependable water supply for oil shale. These fleeting, self-contradictory, and never-never-land references to water supplies and needs are somewhat of an insult to our intelligence. The statement utterly fails to provide the reader with sufficient information and technical data adequate for a careful assessment of the environment impact of the proposed action on Colorado water resources. Thus, this section of the Statement fails to comply with the Guidlines of the Council on Environmental Quality and the National Environmental Policy Act.

For instance, the following are a few well-documented factors in the water supply picture of the proposed action that probably should have been issued in the Statement.

Number one, the possible effects of President Nixon's recent proclamation regarding our difficulties in

meeting U. S.-Mexican treaty requirements concerning the delivery of useable Colorado River water, and the basis for the statement that "consumptive use of water for oil shale development could increase the salinity in the Colorado River system by one point four percent; and the steps Interior plans to take to comply with the EPA approved Colorado "water antidegradation statement."

And the complex and ultimate correlation between the many proposed private, municipal, and quasi-governmental state transmountain diversion projects and the salinity problem in the Colorado River, and the realistic availability of water therefrom for projected oil shale needs.

And the correlation between the various proposed high mountain public and private water oil shale diversion/storage problems and the U. S. Government's stream flow reserved court claims for water on U. S. Forest and BLM lands and for oil shale.

And the potential legal/environmental conflicts involved Federal and private oil shale projects in de facto, roadless wilderness areas on U. S. Forest lands, and on potential Federal wild and scenic rivers.

And the possibility that enactment of the Federal water resources council proposed seven percent discount rate for water projects could well prevent the construction of proposed Federal oil shale projects, such as the Yellow Jacket

and West Divide.

And the Rainbow Bridge litigation, which, according to state water experts, could mean the loss to the Upper Basin states of the consumptive use of about 750,000 acre feet of Colorado River water a year, and the financial impossibility of completing the unbuilt Storage Act Projects upon which oil shale apparently depends, such as the West Divide.

And the complexity of the long-expected Indian Water Rights Claims and the impact thereof on the realistic availability of Colorado River water for oil shale.

And the legal, contractual, environmental, and political problems associated with the future construction of Federal oil shale water projects mentioned in the Statement, West Divide and Yellow Jacket, all with the securing of water for oil shale from Ruedi Reservoir, which would mean the drastic lowering thereof.

These are just some of the apparent deficiencies in the water resource section of the Statement which need drastic revision and upgrading, in our opinion, to make it legally viable.

Then, as to irreversible and irretrievable committments of water resources, the letter goes on to say, according to CEQ guidlines, Interior must identify the expense to which oil shale's water resource demands would curtail the range of other public beneficial uses of the natural

environment of the rivers where all the diversions and dams supposedly need to be built. There is absolutely no study or explanation of possible irreversible damage to the recreational and aesthetic resources of these river systems. We question whether or not irretrievable commitments of this sort are justifiable simply in terms of economic benefits.

For as to alternatives and mitigating measures, sections of the Statement consider energy alternative and mitigating measures relative to the oil shale sites themselves. But nowhere is there a study, development, or description of appropriate alternatives to the recommended course of action in connection with damming and diverting the White and Colorado Rivers and their tributaries. In this respect, the Statement also fails to comply with CEQ guidlines and NEPA.

We submit there are crucial alternatives and mitigating measures Interior must consider instead of assuming that conventional water project developments are the answer to the oil shale water supply problem. The South Fork of the White River is a classic example. Various water developers and agencies, including the Federal Government, think a dam is needed on the South Fork for oil shale purposes. Yet, it appears that the oil shale industry -- I should say it appears from the Statement and from general knowledge, that the oil shale industry wants water out of the White and Colorado Rivers much lower down where the mineral/salinity content is

much higher. That's because the oil shale industry didn't need or want clean water, and it certainly doesn't want the blame for worsening the salinity pollution problems on the Colorado River, either. Considering this, perhaps it isn't necessary to innundate the South Fork which happens to be one of the best wild river candidates in the State of Colorado. This is a State where there are no wild or scenic or recreational rivers designated. Storage facilities could be built in the Piceance Basin; pumping facilities could be constructed. The Federal Wild Scenic Rivers Act should be looked at for both its mitigating measures and as water supply protection measures for the oil shale industry. Yet the Statement mentions none of these possibilities.

All of this obviously requires some imaginative thinking, but that's what alternatives and protecting the environment are all about these days. We think it's about time Interior paid some attention to the Federal Wild Scenic Rivers Bill. This a logical approach to mitigation.

We earnestly request Interior consider our negative comments and implement our suggestions for positive alternatives and mitigating measures before finalizing this Statement or any recommended course of action.

And, in final comment, I would like to say that when I have a chance to take up the matter of this Draft with the Directors of the Council, we will be glad to revise these

comments or subtract by way of subtraction or addition and send our revisions to the Hearing Office in Arlington, Virginia, for your consideration.

Thank you for giving me the opportunity to make these observations.

JUDGE RAMPTON: Thank you, Mr. Scott.

The next is the representative of the Colorado Sportsmen's Association.

MR. ALLEN: Thank you, Mr. Chairman. My name is Norman Allen; I'm president of the Colorado Sportsmen's Association.

The Piceance Creek Basin encompasses an area of approximately 805,000 acres, most of which is winter habitat for approximately 24,000 to 35,000 head of deer. One point I'd like to bring out here is the number of deer is governed by the amount of winter range we have. The amount of summer range is adequate for more animals than we have.

This is the largest herd in the United States, if not possibly the entire North American Continent. This herd is 20 percent to 25 percent of the deer population of the State of Colorado. There have in the past been an important source of revenue to the State to the tune of nearly $2-million annually in the sale of hunting licenses alone. In 1969, 40.8-thousand hunters hunted in the basin. Of this, 29.4-thousand were non-residents. If each spent $50.00 for

a hunting license, they would have spent $1,462,500.00 for licenses alone. This would leave 11.4-thousand residents who would spend $7.50 for a hunting license. This would amount to $84,375.00 which, when added to the non-resident fees would amount to a total of $1,546,875.00 spent for licenses alone, not to mention dollars spent on lodging, transportation, et cetera. In some years the total is even higher due to increases in our deer herds.

The Department of the Interior's propsoed open pit mine would create an area of approximately 5,120 acres and would be approximately 1,100 feet or deeper. This would cause complete and total destruction of wildlife habitat life in the area.

To accomplish this, 256-million cubic yards of loose waste would have to be deposited off site. This alone would create a pile of waste that could be laid on an area of 16 square miles to a depth of 30 feet, or, to put it differently, could cover the entire City of Grand Junction to a depth of 30 feet. This is not taking into consideration the waste from the spent shale after processing it. This, too, would require taking more habitat and range away from the deer herds and wildlife.

All waste and residue would have to be deposited off site for the initial years of operation and will require a land fill that would be a definite detriment to the wildlife

habitat. These areas would have to go through a lengthy, time-consuming process of revegetation that has neither proven to be feasible or possible in the arid basin region. This again will reduce the wildlife habitat at least temporarily, but the wildlife cannot wait several years for their feed and habitat to be replaced. Notable decreases in the wildlife over this period will be a must, and I find it hard to believe they will ever be replaced, even if revegetation is accomplished.

Other sources of reduction in wildlife habitat will be the construction of processing plants, roads, and pipeline and utility installations. These will have as great an impact on wildlife as will pick operation and disposal facilities.

A fact not taken into account in the Environmental Impact Statement is that all wildlife will avoid all areas of operation where noise and human pressure exists for about one-half mile to one mile in all directions. This would amount to more loss of wildlife habitat, although the habitat is not directly affected by destruction from mining operations.

From these facts we could calculate the area of wildlife habitat to be lost to be more in the area of 75,000 to 100,000 acres per operating site.

This in turn would call for near total loss of the White River migration herd and leave little if any hope of its ever returning to its present state after mining operations have ceased.

At the present consumption of oil in the United States, it has been estimated that we have only a 15-year supply of oil left. The United States uses 3,517,450,000 barrels of oil per year at the present. If the oil industries can in fact reach its goal of 100,000 barrels per day production from oil shale, it will produce 36,500,000 barrels per year. Over a period of 30 years, as proposed by the oil industries for the prototype leasing program, they will have produced 1,095,000,000 barrels of oil. At the present consumption rate, this would last the United States a mere 1.5 months or 45 days. Is the price we are asking to pay for 45 days of oil worth it? Effected loss to animals, such as mountain lions, elk, peregrine -- endangered species -- and prairie falcons could be up to 20,000 acres per year. For the Department's proposed 30-year program, this amounts to 600,000 acres, subtracted from 805,000 acres, leaves only 205,000 acres for their remaining habitat. From these facts we could assume a complete loss of these animals from the area as they could not withstand this kind of pressure for such a prolonged period of time.

A proposed airstrip would be further encroachment on the habitat and harrassment of wildlife. If complete utilization of the sites are used as proposed, there could be no possible way to have an on-site airstrip. This would result in further loss of wildlife habitat for an off-site airstrip.

If companies can afford to sink millions of dollars into an oil operation, they can surely afford to keep a fleet of vehicles at an airstrip in Rifle or Meeker for transportation to and from site areas.

The Department of Interior's Draft Environmental Impact Statement is totally inadequate in both scope and content. The Department has considered only point five percent of the oil shale area having potential economic interest. The study does not consider the adverse effects of a mature long-range industry, nor does it adequately appraise the potential impact on water resources in the lower Colorado River Basin.

It seems reasonable to consider a long-range program rather than the proposed short-term program for one simple reason. After private companies have spent millions of dollars in the development of oil shale and find it to be a profitable enterprise and wish to continue operations to recover and profit on their investments, it would place the Interior Department in a very difficult -- if not impossible -- position to shut down the industry even if the environmental effects proved to be grossly unacceptable.

I find it hard to believe that the revegetation of backfill areas to a condition that would provide a good wildlife habitat will be "difficult and time-consuming" if not altogether unfeasible.

It is further unreasonable to assume that open pit mines would be completely back filled under any circumstances. Bother overburden and spent shale would have to be stored off site during initial years of operation. Since the shale volume after retorting exceeds the in-place volume before mining, it is impossible to return all such shale waste to the pit area without creating an elevated land surface.

Wherever stored, the spent shale must be permanently shielded from percolating ground and sub-surgace water. Engineering safeguards may be effective during the lifetime of the oil shale plants, but who is to maintain the protection works after the site is abandoned? Unfortunately, these questions were not even raised much less answered.

The goal of no degradation of water quality is patently impossible in an operational sense. Because of consumption of waters to be used in shale retorting, inevitable reductions of the quality of water available for dilution of downstream pollution loadings will occur. This added to the projected 947 milligrams of salt to be injected into the present river load makes aquatic or aquatic-dependent life in the Colorado River impossible. If the oil shale industry can, in fact, achieve its no degradation goal, it will indeed be unique.

The possibility of alternative sources of energy were discussed in the Impact Statement, but at no time was

the possibily of alternative methods of mining or site locations discussed. After considerable research, the Colorado Sportmen's Association feels there are alternative methods and attracts sites available that would be far less destructive to the wildlife and far more beneficial to the environment.

The area between Roan Cliffs and the present State Highway No. 6 is virtually useless as wildlife habitat and winter range. Very few small game animals use this area. This area could be used for both a plant and waste disposal site without many, if any, adverse effects on wildlife or environment.

One or more horizontal shafts in the Anvil Points Experimental Station could be utilized for access into the basin. This would create a situation with little or no specific disturbance to the Piceance Creek area. In this manner, the oil industries could possibly have their oil and the people of Colorado could retain its deer and wildlife for posterity.

JUDGE RAMPTON: Thank you, Mr. Allen.

Our next participant will be Mr. Richard Scales, the Environmental Task Force.

(No response.)

JUDGE RAMPTON: Diane Smith.

MRS. SMITH: Mr. Chairman, members of the panel,

ladies and gentlemen. We are here today to discuss facts and opinions in order to help the government come to a final decision on a matter of national importance.

Sometimes a person will waver back and forth in his thinkong -- deciding a thing one moment, against it the next. All of us need to have the courage to make decisions and to follow through on them. The Department of the Interior has been talking about oil shale since 1918; now, it's trying to act.

Let us today reverse the flow of negative thought and indecision. Let us give thanks for challenges and the opportunity to solve them.

The cry of shortage is heard, in the middle of abundance. There is ample supply of raw material here. Man's part is to mold and shape this raw material into manifestation.

The report places the human being in the same category as that "rare and endangered species, the hum;-back sucker and bony-tail chub fish." Could our priorities be confused? Why should the welfare of the human being be subordinated to these fish? If someone wishes to preserve them, could they explain why it would take the whole Piceance Basin to do it? With all due respect, are you sure a hump-back sucker wants to be preserved? If that's not strange enough, the human being barely gets equal billing with a bitter bush or sagebrush. What is the contribution of these plants to

our world? Better vegetation could and should be growing there. I'd like to hear about the improvements we should make.

The pendulum has swung from bulldozing everything that stood in our way to the threatened stoppage of a needed industry for the sake of a fish or plant. Both ways are extreme. Let us today choose the path of reason.

What I am concerned about is that rare and endangered species, "the homosapiens." What is going to happen to us if we run short of fuel? Have you ever been in a blackout? Can you imagine the confusion when all the lights go out? The elevators stop, the phones are silent, the surgeon's knife stops in mid-air we hope. You think you can drive out of it, but forget it. If you have gas in your car, the traffic lights are stopped and the traffic's in a snarl. If you need gas, the fuel pumps will have stopped working.

Let's look a little further into the future. No warmth-- no jobs. Maybe one of our children will freeze to death in the winter. Colorado winters are long and cold. Maybe the power will fail in a hospital at a critical time for you or a loved one. Maybe the old folks won't make it in the dismal future world of cold and hardship. Somehow these things touch me more than the hump-back sucker and the bitter bush. It could be a dark age -- in more ways than one.

But let us look at the positive side. All around us is oil -- shale, dawsonite, which is a potential source of aluminum, and nahcolite, which is a potential source for cleaning up our environment. Let us explore these potentials instead of wasting time "gloom-dooming" everything. I believe they are God's gift for us to use beneficially. Why aren't we using them?

As the Chairman of Continental Oil said, "If we fail to meet our burgeoning energy requirements, it will not be because the Lord failed to provide us with enough. It will be because we lacked the perception, intelligence and skill to foresee our problems and to move in timely manner to meet them." I don't believe the great number of people who have studied the problem so long lacked the intelligence to solve it.

The report discusses location. Could there be a better piece of land for industry? I've driven with my husband for hundreds of miles through this arid country without seeing anyone or anything. I cannot imagine anything that is intelligently done that will not improve the area.

The report worries about increase in crime. A birth in any town may increase the crime rate or it may produce a future president. This reminds me of the story of the two men tracking rocks. When the first man is asked what he's doing, he answers, "Tracking rocks." When the second man is

asked, he answers, "I'm building a cathedral."

The report worries that if a city is created it will cause increase in crime. Of course it will -- stealing sagebrush is not very profitable. It will also increase the noise, but not necessarily to the level of any of our existing towns. Are we trying to make the projected town so perfect, with so many rules and regulations, that no one will be able to live there? Do any of your towns have these regulations?

A 32-page description of the environment of the Colorado tracks can best be summed up by saying these are areas not inhabited by man and have not even attracted him for any other reason than the development of an energy resource except for a limited number of hunters for a limited number of days. Let us look at hunting.

The report worries about the mule deer. Why are the mule deer so protected most of the year and then left to hunters to kill and wound? An average of 9,000 deers (sic) are killed and as many as 1,500 are left wounded each year. What is the rationale? If we want to protect them, stop hunting. If you want to continue hunting, make an environmental impact study of the hunting season. This is required by the National Environment Policy Act.

In Aspen we have a large herd of elk that comes back to our ranch every year. We also have ducks, deer, rign-tailed foxes and boyotes. WE don't disturb them. Our house doesn't disburb them. They are friendly because we are.

The presence of wildlife depend more on the attitude of the human than on his activity. I can bisualize a herd of deer grazing in sight of an oil shale plant, provided that they don't permit hunting and particularly if some more palatable forage than sagebrush is made available.

I would also like to ask if there is more reason to worry about the accidental release of saline water than of radio active material from the Rio Blanco and Rulison Projects which have Government approval?

Some of us may die in the near future from lack of fuel, lack of power, and from thinking and talking about lack -- lack -- lack. Until it becomes a way of life. What are we so worried about? Here is an industry that can be stopped at any moment, unlike the projected Rio Blanco or Rulison nuclear explosions.

Let us think about what we'll gain from it. The report says production of 100,000 barrels of oil a day would only disturb 1,800 acres. That's 730,000,000 barrels of oil in 20 years for disturbing 1,800 acres. Why say disturbed? Why not think utilize for the benefit of the people? The oil would be worth at least $2-billion.

Where does much of this money go? Through taxation it will build hospitals, schools, churches, playgrounds, and do much to enhance the envirnment. That is, if we don't throw up our hands in despair and say we are not competent

to improve the land. What schools and hospitals are adequately funded in your districts?

Oil experts say that in ten years Saudi Arabia will own 85 percent of the oil in the world unless we develop our own resources. I don't want to find us dependent on a foreign country for energy, do you?

Let's start thinking positively about this area. What we'll gain from it, what we'll give to it, what we'll add to it, and how we'll improve it. That's how we started our country; that's how we became great. We have been given a gift. Let us use it wisely and courageously for the public benefit.

Thank you for your kind attention.

JUDGE RAMPTON: Thank you, Mrs. Smith.

Joan Nice.

MISS NICE: My name is Joan Nice, and I represent the Executive Committee of the Roaring Fork group of the Sierra Club.

In Western Colorado we're worried about water. Under the terms of the Colorado River compact, we've promised more than we can give. And we're worried about public lands. From all we've heard about oil shale in the press and in the income tax statement itself, the proposed leasing program may be more than beneficial to all companies than to people.

Interior's goal for oil shale development was

encouraging initially. They stated that they wanted to provide a new source of energy and provide it, quote,"in a manner that will assure minimum possible impact on the environment." Lately, however, the tone was changed. Now they say that 1,000,000 barrels a day in 1985 justifies a "profound" impact.

That impact could affect us personally on the Western Slope. We are told in the Draft Statement that development on public rather than private lands, quote, "will lead to a better evaluation of the water resources, will document causes and effects, and will enable corrective actions to be taken that will mitigate impact on water resources." Why haven't resources, causes, and effects, and corrective actions already been evaluated since we seem to be on the doorstep of development?

I have one very specific question to ask. Volume III, Section 5, Page 63 of the impact statement explains: "All constructive activities exclusive of actual mining activities that may cause the creation of new lakes, drainage of existing poinds, diversion of natural drainages, alteration of stream hydraulics, disturbance of areas of stream beds or degradation of land and water quality, or adversely affecting the environmental integrity of the area are prohibited unless approved in writing by the mining supervisors," unquote. Wouldn't this kind of power be safer in the hands of a

committee that includes industry, government and citizens?

The impact statement does a fairly good job of listing general adverse affects on water. I have to agree that they are profound -- "dams and reservoirs constructed," "natural streamflow depleted," "1.4 percent increase in salinity in sedimentation," "increased population and sanitary water load," "possible effects on ground water quality."

After the problems have been laid before us in only the most general terms, we are given nothing but promises of monitoring and prompt action as soon as the impact becomes apparent.

I can only conclude that Interior is taking hasty action in this matter, that they are conducting a huge experiment on the land, and that where this experiment fails the public stands to suffer.

It's said that we will reap the benefits; that with proper development now our appetites for electrical power in the future will be satisfied. But I think we've been misunderstood. We're looking for ways to control those appetites, to release ourselves from excessive consumption. Therefore, the quick phrase, the energy crisis, is no justification for the development of the Piceance now. If we must be dramatic about it, you might say we've discovered the environmental crisis. Our dedication to the environment at this juncture could make the energy crisis obsolete.

Thank you.

JUDGE RAMPTON: Thank you.

James Smith?

MR. SMITH: Mr. Chairman, members of the panel, ladies and gentlemen. My name is J. H. Smith, Jr. I live in Aspen, Colorado. I've been up there for about 25 years, and for 18 years or so I've been studying and working on the problems of the Piceance Basin.

A discussion of the report means we must look ahead to about 1985 -- 13, say, years from now. By then our population will have expanded to 237-million people, some 28-million new people. Our energy consumption will have increased by a far larger percentage.

Let us agree that we are not going to shift these people out of the country and that we cannot accept more people to live in a given area without the changing of characteristics to some extent.

This means somewhere in the U. S. we are going to build the equivilant of 560 new towns of 50,000 people each. The report indicates that you cannot do this -- accommodate people in these numbers in a new community without downgrading the environment. This is precisely the point that I wish to challenge. We not only can do the job, but we also have to do it. In my opinion much of this report, even though we attempt to cut it down from its presently rapidly accelerating

use, let's say, reflects a defeatism that cannot be accepted if we and succeeding generations are to survive. The report indicates that we have learned nothing and that we cannot or will not improve our future performance. It indicates that if we are allowed to build a new town we will do no better than duplicate the noise, the smog, the smells, the visual tracks, the traffic tie ups of our present cities.

I do not believe this is so. Thanks to many great people -- Fairfield Osborn, Louis Bromfield, Rachel Carson, Margaret Sanger, and others who for a half-century have been warning us about our disregard for the sensitivity of the limitations of our natural resources -- we have learned a lot. These people did not say, "Stop everything." They said, "Act intelligently." This is our responsibility today.

Thanks to other great people -- Buckminster Fuller, Doxiades, Niemeyer, Solari, and others, we have probed new methods of providing shelter for man and there is no reason to believe we cannot get on with further development.

Thanks to great land developers we have seen new towns created which optimize the interaction of man and nature. I think of Tapiola in Finland, Brazilia in Brazil, and Columbia here in our U. S. A. The creators of these communities were responsible for major changes in the concept of land-use planning, yet today they would say they were only on the threshold of what can be done to fit man into

nature or to have nature enhance man, whichever way you wish to look at it.

In the same time frame, from now till 1985 this country's potential labor force will increase by some 20-million and boys, well-educated, physically fit, and ready to meet a challenge if we don't present them with a picture of defeatism and despair.

Today about 58 percent of our 209-million people are urban. At least 58 percent of the up-coming 2-million will be urban -- the urban environment is the choice of those who have a choice; is a necessity for all of those who haven't the resources to live elsewhere. So approximately 12-million will be added to payrolls in urban areas unless we do something now it will be mainly in today's urban sprawl.

How can we fail to meetthe challenge to create new, properly designed towns? The economists are saying we cannot afford to do it because of dollars. The new ecologists saying we cannot do it because it will disturb the mule deer and the wild horses, and will mow down some greasewood and sagebrush.

I cannot believe that our values have become this distorted. We have a Highway Trust Fund with an income of several billion dollars a year, and about a 4-billion dollar surplus in the bank, just to build 70-mile-an-hour highways. We have a multi-billion dollar space program. We spend

seberal billions of dollars a years on cosmetics and candies. Yet we say we cannot tackle the job of creating communities which provide our citizens with a livable environment.

On the ecology side, I cannot believe that anyone can seriously say that 10,000 acres of sagebrush is important. The recommended treatment for sagebrush in modern range management includes railing, ripping, rolling, scraping, scrubing, mowing,flooding, burning -- if you get the picture. It's a water thief, and its presence, in my opinion, is an indication of neglect of the land. If it's importance as browse for animals, it is only so as a last resort. However, I'd be glad to talk to any sage enthusiast, and maybe I'll learn something new. I would like to know why BLM's income from this type of land is four cents an acre per year.

More seriously, I believe that those who testify on matters of national importance such as this must be more than emotional and indicate what they are doing, not just proposing, to avoid the dangers or to bring about the improvements they forecast.

So the burden on me is to indicate why I believe this can be done well. Almost 20 years ago it became apparent to a number of people, including myself, that if oil shale were as important as the Government said it was, then the matter of land use planning for industry, and particularly for the new population, was being neglected. Cornell University

was consulted, and due largely to the generosity and enthusiasm of the Department ofCity Planning, the Cornell professors and graduate students led by Professor Edmondson, the area was studied and a community was planned.

Almost 40 people with a great variety of expertise worked on this. They didn't throw up their hands in despair. Here is what they said in their final report of 1958. "Unbridled by the usual restrictions of an existing pattern and the incorrigable mistakes of lack of planning in the past, it is clearly our duty to design the country's most modern city. It must be so planned that it will enhance the land rather than become a blot on the countryside." "The site is both a stimulation to the imagination and a challenge to the capability to the planners."

This group spent over 5,000 mandays in the field and on the job, far more than all the witnesses at these hearings have spent in the Piceance Basin. They were not defeated. They looked at this as a great opportunity to demonstrate man's increasing competence.

Shortly after this the University of Denver, through its Research Institutes made a study in depth of the economic significance of the forthcoming industry. This made it clear that the funding -- the financing -- of a "most modern city" was possible because of the dollars that would be generated by the industry and which could be used to do the job properly.

Only one thing was lacking; the largest land owner and the influential authority in the area were not participating in the studies and plans.

So, in January, 1964, letters were addressed to these authorities by a group of long-time residents and land owners in Garfield County. I quote in part: "This association, which includes members who have worked for many years on the planning of a suitable community for the industry, urges that the Federal Government, as the major land owner in the area, give attention to a program for the orderly development of a community which will be required to support the shale industry.

"Much Federal and private money is being spent today to irradicate slums and rebuild areas which were hastily or unwisely planned. In this instance the opportunity to plan well in advance exists and should be taken. Rarely is there a chance to design and build a residential and industrial center from scratch, using the great theoretical knowledge that has been accumulated, without being inhibited by existing structures, utilities, et cetera."

I continue to quote: "A handful of private owners however, cannot do this without knowledge of the plans of the largest owner, the Federal Government -- or without aid and advice from Government agencies in their normal course of duty. Many problems go beyond municipal, county, and state boundaries," as Mr. Cooley mentioned earlier. "The location

of the intercontinental highway and other communication and transportation systems, the general development of the river basin, the pollution of air and water, et cetera, are examples. Of particular importance is the quantity and quality of water, and it must be noted that despite many statements in water policy and water legislation that sufficient supplies will be kept available for the development, the supply is, in fact, constantly being committed elsewhere.

I continue to quote: "We would like to emphasize that we are not seeking any special aid -- this project will not develop unless it proves its own economic feasibility -- but we would like to know what the activity of the various branches of the Federal Government will be, and we will be glad to apprise them of our plan.

"Finally, on the matter of community development, one need only look at some of the ravaged hillsides in Colorado to get some idea of what could happen in an area where the mining will be indefinitely more intense and longer-lasting. On the other hand, it takes little imagination what could be done with this magnificent topography around the oil shale lands, given time to prepare. Elsewhere most of our existing urban centers are being redone at great expense; here the most modern concepts of a community can be applied from scratch to develop in Colorado a show place comparable to the greatest of recent urban projects. It is

believed that our thinking should be geared to a new dimension, because this venture cannot be successful without being very big and, therefore,it is able to accept the challenge of breaking traditional Topsy-like growth and ultimate decay of the Colorado mining town."

I continue to quote: "With this in mind, several of our associates have been concerned in preparing a phased development plan for the area, and the recent applications for land by various industrial companies has led us to accelerate this effort. We seek no funds but do solicit the continued interest of your office and the appropriate agencies of the State. We will use our best efforts to expedite the arrival of a shale industry and to provide its personnel with an environment which the state can be proud."

These letters, written eight years ago, received no reply. They were to the Secretary of Interior and to the Governor of Colorado. Two years later, however, because of availability of Housing Act Funds, it was possible for a team of faculty members of the University of Colorado to undertake a study of the Western Mountain Region of Colorado, including the significance of oil shale. Since then the counties involved have moved ahead with planning. A regional organization has been set up. And again Mr. Cooley has discussed that already. In the last two years at least 40 studies have been made by individuals and organizations on oil shale and its

implications. In addition, and fortunately, some people have done hard, practical work to test out processes of production, revegetation, et cetera.

However, despite warnings in the above-mentioned letters eight years ago and from more expert people, such as Northcutt Ely of Washington, six years ago, the Federal Government and the State have done little to assure the quality and quantity of water needed to unlock this national resource. I stress quality now, as I always have, because quantity of water is meaningless unless you know it is usable. The water now being delivered to Los Angeles, San Diego, Mexico, from the Colorado River by contract is below the Public Health Standards now today without any industry on the Western Slope. The salinity occurs, however, beyond the borders of the State of Colorado. Our highest quality water is being diverted from high altitudes, western water sheds, to the eastern slope to raise the standard of their water as well as increase the quantity. Where is the environmental impact statement that justifies this? What Interior s report says is that we should quietly sit by and let someone else degrade our water by diversion. I suggest that we stop diversion in order to permit a reasonable amount of national interest industry on this slope.

I use the term national interest industry intentionally. We are not now talking of an industry of local importance.

If oil shale is useful at all, it will have country-wide benefits. It goes to the heart of our seriour balance of payments proglem. A deficit from energy alone which will amount to as much as $25-billion a year in 1985. It goes to the heart of our posture in the world scene. Can we supply ourselves, or are we to wait in line at the door of some of the new major producing countries? It goes to the heart of our future life style. How much are we going to have to cut our per capita energy consumption? 10 per cent or 20 percent probably would do us some good. 30 percent might cause real hardship. What will we pay for crude oil? $5.00, %6.00, $7.00?

This is a very serious problem. I offer my answer. Get on with a definitive prototype program at once and see what actually happens with one or more large plants. You can always stop a shovel in mid-air or mid-shale. It is not like Rulison or Rio Blanco which threaten us because you cannot stop radioactivity once started. Pay attention to all of these reports and warnings that have been issued. Be alert and apply our vast accumulated knowledge to the problems already foreseen and be willing to face unforeseen problems while we now have the time to solve them.

If we do not have the courage to do this now -- and by we I don't mean the Department of Interior alone; I mean the full force of the Government -- the Federal Government

should stop talking and theorizing about oil shale as a national asset. It should retract the recent statement that there are 80-billion barrels oil available in "them thar mountains" and let the Piceance Basin seek its own destiny in non-federal activities.

Thank you very much for your patience and attention.

JUDGE RAMPTON: Thank you, Mr. Smith.

It's now twelve o'clock. The purpose of this hearing is to obtain information on the -- and comments on the environmental Impact Statement, and it's also for your convenience. And therefore, I propose at this time to ask those present whether or not they would like to continue through the lunch hour and possibly be through by one o'clock since we have about six or seven participants, or come back at one o'clock. All in favor of the first -- would I get a show of hands of continuing through the lunch hour? All right, let's take the second. I believe the first proposition is carried, and we will take a ten-minute recess and then come back at ten minutes after twelve and continue this hearing to its conclusion.

(Whereupon, a short recess was taken.)

JUDGE RAMPTON: The hearing will come to order. Resume your seats, please.

The next participant I have on my list is Mr. Fischer, Colorado River Water Conservation District.

MR. FISCHER: Mr. Chairman, members of the panel, ladies and gentlemen. My name is Roland Fischer, secretary-engineer, The Colorado River Water Conservation District in Glenwood Springs, Colorado. The District is the primary western Colorado water policy body, including all of 12 and parts of three more counties. Its area is 29,000 square miles, encompassing the principal headquarters of the Colorado River. The 15-member Board of Directors is appointed by the respective Boards of County Commissioners.

Mr. Chairman, to further identify the District, included are two maps, one showing directors and their counties, and the other showing ranges.

These comments have been prepared by me and general counsel, Mr. Kenneth Balcomb of the firm of Delany & Balcomb of Glenwood Springs, Colorado. They are staff comments to the extent that they have not been specifically approved by the Board, although the Board has directed that comments or testimony be presented at this meeting. The Board will meet October 17, 1972, Mr. Chairman for its Fourth Regular Quarterly meeting of 1972, and after that meeting additional, more detailed comments will be presented.

Because the three volumes of the Draft Environmental Statement for the proposed prototype oil shale leasing programs run to many hundreds of pages and the material is both voluminous and comprehensive, I at this time ask for an extension of the

time in which to submit the District's additional comments. You have spoken to the point. I request an extension to November 30th.

In addition to the large volume of material in the Draft Statement itself, a fairly large volume of additional material must be reviewed for our additional comments. However, I would at this time like to make these preliminary comments, and unless specifically cited all references are to Volume I of the Draft Environmental Statement for the proposed prototype oil shale leasing program.

Concerning water supply, Page II-20, there's references to the Colorado River Basin Project Hearings, quote, "Hearings before the Subcommittee on Irrigation and Reclamation of the Committee on Interior and Insular Affairs, House of Representatives, 90th Congress, 2nd Session, on HR 3300 and S 1004, January 30, 1968 to February 2, 1968." This document is identified as Serial 90-5.

Page II-20 of the text includes the statement, quote, "This assumes that the Upper Colorado River Basin states are to supply one-half of the Mexican Treaty obligation, or 750,000 acre feet a year." However, in Serial 905, then Secretary of Interior Udall testified at Page 700, quote, "Also influencing our judgment is the uncertainty as to whether the Upper Basin is obligated to meet any of the Mexican Treaty water deficiencies."

At this time, to my knowledge, neither the State of Colorado or the Upper Basin states have acknowledged any obligation to the Mexican Treaty, and we request the above reference to an Upper Basin Treaty obligation be stricken from the final report.

Also in Serial 905 we find Mr. Aspinall's comments on water supply, Pages 748 and 749. The list of depletions on authorized Federal projects and possible depletions totals 2,992,000 acre feet per year. Certainly some of these depletions would be for projects that include oil shale water.

But Table 2 of Volume I at Page II-21 shows Colorado's total allocated share as 2,976,000 acre feet of water annually, and quote, "total water that could be made available for depletion for oil shale development" as 159,000 acre feet annually. The water supply figures shown in Volume I may not accurately reflect the water supply picture and the basic data upon which they are calculated should be discussed.

Of the 159,000 acre feet shown available for depletion oil shale development in Colorado, 147,000 acre feet would appear to come from Green Mountain and Ruedi Reservoirs and the West Divide Project. I estimate that perhaps 70,000 acre feet of that would come from the two reservoirs. At this point in time there is no certainty as to the availability of oil shale water from those two reservoirs. This is not to imply that it will or will not

be available, but pending questions surrounding them must be resolved.

Mr. Chairman, the Secretary of the Interior has been contacted on this question, and we would expect to meet with him -- with his staff in the very near future. The State Engineer of Colorado is also involved.

There is no mention of the requirement in PL 90-537 that the West Divide and the four other western Colorado projects in that bill must deliver water at the same time as the Central Arizona Project. Central Arizona is under construction. West Divide is not. If an oil shale industry is to rely upon the West Divide project, we urge the final report include specific language that West Divide must deliver water simultaneous with the Central Arizona project.

Concerning water and availability, some calculations by this District show a difference as to the amount of water available to the State of Colorado from the Upper Colorado River Basin water resources. The difference may not appear to be great -- it's about 120,000 acre feet a year; that is, 2,976,000 acre feet in the Draft Report versus 2,856,000 calculated by this District. But the differences do compound.

Reservoir evaporation assignable to Colorado is realistically 200,000 acre feet a year, not 342,000 acre feet as shown on Page II-21. Additionally, the Glen Canyon operating criteria promulgated by the Secretary of Interior

in 1970 may be placing an unjustified burden upon Upper Basin Water resources, and a re-evaluation of water resources in the Draft report may be in order.

The Draft Statement on Page II-20 estimated 5.8 million acre feet per year available to the Upper Basin. This figure may not be realistic. Using the virgin flow of the Colorado River for the period 1922 to 1970 and the present operation criteria as promulgated by the Secretary of Interior, the amount of water available to the Upper Basin may probably be more nearly 5,570,000 acre feet per year.

The Draft Environmental Statement implicitly does not take into consideration other possible uses of Colorado's compact allocated share of Colorado River Basin water. Many of these other uses have been decreed. This is not to imply that oil shale will not be the dominant or even sole user of Colorado's remaining share of Colorado River water; however, these other uses have apparently not been considered even though they are decreed, and some accommodation of these decrees is going to have to be reached.

It is uncertain from the Draft Statement how much water would be required to support an oil shale industry and how much water is available. For instance, Table 2 on Page II-21 implies 159,000 acre feet a year if Colorado resources are to be commited to an oil shale industry. From the Table this appears to be all of Colorado's remaining water.

On Page 7-5 under the heading "Irreversible and Irretrievable Commitment of Resources," Paragraph c, we find the statement "From 80,000 to 125,000 acre feet per year of surface or underground water could be used to support the water requirements for a one-million barrel per day industry, and supporting population. Part of this water would be diverted from Colorado, White and Green Rivers, and would not be available for other as yet unspecified water needs," close quote. The facts are many of these other water needs are specified and they are decreed in the State Courts. The United States itself has claimed 200,000 acre feet of water for oil shale purposes in the Division 5 water court and the Draft Statement does not mention the government claim.

The Deoartment of Interior Bureau of Reclamation recently released for comment two proposed reports dealing with the proposed Yellow Jacket Project in the Yampa and White -- the Yampa is a tributary of the Green -- River Basins. The reports are the proposed Draft Environmental Statement, Yellow Jacket Project, Colorado, and the proposed Yellow Jacket Project, Colorado feasibility report. The Project would develop approximately 101,580 acre feet of water annually. Approximately 71,500 acre feet of this would be for industrial use in the development of the oil shale and coal and for municipal and domestic uses of the population -- the population increases expected to accompany industrial

development. And it is not clear from the Draft Statement if the 71,500 acre feet of Yellow Jacket water has been considered or not.

Further, I'd like to suggest that the Draft Statement does not clearly set out the difference between anticipated diversion and consumption requirements, and this difference must be clarified.

Concerning dissolved solids, in directing itself to the subject of salinity or concerning salinity or dissolved solids, the report appears to direct itself only to the concentrating defects of the diversions of fairly hight quality water from the surface streams to an oil shale industry. But it's unclear from the report what the effect on surface water salinity will be as a result of sewage plant effluent from the increased population and from other salt-loading sources.

The emphasis in this report, as in nearly every Federal Environmental Statement dealing with the Colorado River Basin is on the effect of increased salinity of Hoover Dam or some other point in the Lower Basin. I suggest that in the final environmental draft statement there be included a quote from the Bureau of Reclamation document Colorado River Water Quality Improvement Program, 1972. The statement to be included appears in the Forward on Page ii. It is as follows, quote: "The objective of the program is to maintain salinity concentrations at or below levels presently found

in the lower main stem of the Colorado River. In implementing this objective, the salinity problem will be treated as a basis-wide problem, recognizing that salinity levels may rise until control measures are made effective while the Upper Basin continues to develop its compact apportioned waters."

Mr. Chairman, thank you for the opportunity to comment.

JUDGE RAMPTON: Thank you, Mr. Fischer.

Doctor Gerald Wood.

DOCTOR WOOD: I am Dr. Gerald P. Wood, director of the Air Pollution Control Division of the Colorado Department of Health. I am responsible for the implementation of the plans and regulations developed by the Air Pollution Control Commission of the State of Colorado under the Colorado Air Pollution Control Act of 1970, and Chapter 66, Article 31, of the Statutes of State of Colorado.

I wish at this time to place in evidence the approved Air Quality Implementation Plan for the State of Colorado. This large blue book here (indicating). This was submitted on January 26th, 1972, by Governor Love to, and accepted by, the Federal Environmental Protection Agency with legislative recommendations which have no relation to the body of the plan. This document obviously not available to the planners of the Department of the Interior.

The Air Pollution Control Commission's regulation No. 3, which is that concerning permits to construct and operate new machinery under the authority of Chapter 66-31-12 of the Colorado Air Pollution Control Act states in part, under Paragraph IID and IIIG, the Division can only issue such permits to construct or operatre machinery that will not conflict with Federal, State, or local emission control regulations or ambient air quality standards.

The Commission has expressed the opinion that they will not knowingly allow any machinery to open up under a varience from standards of emission or ambience air quality.

The Division does not see the type of attention to detail in the environmental statement, and it expresses surprise that, in a statement of this magnitude, requiring a great deal of intergovernmental exchange, they have not been consulted. The Division was required to buy its copy of the statement and it believes that this type of disregard of normal planning mechanisms can lead to grave misunderstanding of the intentions and policies of the Department of Health and the Air Pollution Control Commission. There is a grave danger of negation of the valuable services rendered in preparation of this statement and requirement of duplication at considerable expense to the taxpayer, whose pocket is not bottomless.

The economics of labor being what they are, it is

certain that the most modern machines controlled by machines will have to be used and this means small work forces of highly skilled and educated men, apart from the relatively small amount of roughlabor that can be locally supplied. Until the whole region is opened up it is doubtful if there will a great difference in the life style of the area.

The proposed refinery would have to consider a totally enclosed and aspirated system of material handling and, the retorting operation inclusive, would have to be prepared to use filtration of the quality of the systems used in the new collectors at the Four Corners power plant, such as Venturi scrubbers at 40-60" pressure drop, or if equivilant.

We have noted that in the non-designated areas of States, the ambient air quality standard for particulate is 45 micromilligrams per cubin meter; and, therefore, in this area a ground level concentration increment of 15 micromilligrams would be too much. The degree of control for several plants are in the valley is at the limit of modern technology.

I have a further statement prepared by the Air Pollution Control yesterday, Your Honor.

JUDGE RAMPTON: Yes. That was to be delivered by Mr. Kirkpatrick?

DR. WOOD: Yes, it was.

JUDGE RAMPTON: He's not present, so you will give that statement?

DR. WOOD: Yes.

JUDGE RAMPTON: All right, proceed.

DR. WOOD: The Colorado Air Pollution Control Commission has asked me to render its statement which follows:

1. The Commission staff is in the process of developing plans and strategies for hydrocarbon control that will involve new regulations.

2. The specific regulations for oil shale and coal gasification processes to control their emissions are under research at this time, and this matter will be considered at the appropriate time.

3. The Commission is aware of the Governor's charge that industry must meet the standards of emission and air quality which are current at the time of construction of these plants, and the Commission will take the necessary steps to support this charge.

4. The Commission draws the attention of the Department of the Interior to the National Environmental Act, Section 102, which requires review of environmental statements with appropriate state and local agencies. We received no such statement and would appreciate liaison in future statements.

6. The Commission thanks the Department for the opportunity to make their position clear, even at this date.

JUDGE RAMPTON: Thank you, Dr. Wood.

DR. WOOD: Any questions?

JUDGE RAMPTON: None.

DR. WOOD: Thank you.

JUDGE RAMPTON: Mr. Ron Gitchell of the Meeker, Colorado, Council.

MR. GITCHELL: Mr. Chairman, members of the panel, ladies and gentlemen. I'm Ron Gitchell from Meeker, Colorado. I'm a member of the executive board of the Big Country Headqaters RC&D. I'm a member of the Meeker Chamber of Commerce, the Meeker Town Planning Commission, and a duly elected councilman for the town. I'm also a professional engineer. Both the Meeker Town Council and the Chamber of Commerce have asked me to deliver before this hearing our hurriedly gathered comments regarding the Draft Environmental Statement.

First, neither the Meeker Town Council nor the Meeker Chamber of Commerce were aware of the availability of the hearing until Monday, October 2nd. I was not able to obtain a copy of the Draft until Monday of this week, October 9th. And herein lays our joint complaint: Meeker is going to be one of the major hubs of activity in the currently proposed oil shale development project.

In all three volumes, under the heading of Comments Requested, we find listed such units as The Colorado Open Space Council, Sierra Club, Wilderness Society, Izaak Walton

League, Friends of the Earth, and such oil companies as Phelps, Shell, Superior, Cameron, Sun, Western, Union --just to name a few. But we find no mention of requesting comments from Meeker or Rangley -- towns who are to feel a direct immediate impact from any activity concerning the development of oil shale. For the Friends of the Earth or the Sierra Club's comments to be sought out or considered more important than that of the Towns of Meeker and Rangely, both of which sit right in the middle of all this development, is just beyond our comprehension. When the Federal Government ignores local government and when private organizations seem to take precedence over local government, you will find us, the elected local officials, becoming more irate than we already are over federal intervention into our local affairs. To make matters worse, the Council noted that the list of Comments Requested doesn't even include the Rio Blanco County Commissioners or the Rio Blanco County Planning Commission while better than 80 percent of the best oil shale lays inside Rio Blanco County.

Now, I just breezed through the engineering portions of the documentation. Suffice it to say that the oil shale industry is more qualified to support or reject the engineering aspects of the Draft Environmental Statement.

We, the officials and businessmen of Meeker, feel that private industry must be allowed to develop this unique resource called oil shale. If they don't, we feel that the

Federal Government will create another AMTRAK and start digging away without regard to us or our local environment. That is to say, if we don't, Congress will, for this nation's energy crisis is the reality of today. We simply do not have enough energy for this nation to continue to run on, and the deficit, like the national debt, grows larger every day.

I've said it before, and I'd like to emphasize it again today. 8-million people live in Los Angeles County; less than 5-thousand live in Rio Blanco County. Rio Blanco County has only one Congressman in Washington; Los Angeles County has 17. The City of Los Angeles has more people in it than we have in the entire State of Colorado. This is where the balance of power lays in any struggle over our resources. Nation-wide we're outnumbered by better than 200-thousand to one.

Some people and groups will tell us that we cannot allow the development of oil shale, but the responsible rightly conclude that this development is imminent and that we must proceed. But we are going to keep an eye upon our environment to make sure the impact is an minimal as today's technology will allow. And we'll all have to keep updating this technology as we go along.

One of the areas of major concern is the disposal of the spent shale. Some weeks ago some of us had the privilege

of touring the Colony Oil Shale Pilot Plant in Parachute Creek. There we stood upon the spent shale revegetation test plots and reeled at the conclusion that spent shale is highly toxic. And that some of these toxic components are significantly water-soluble. The leaching of these soluble components is a viable major problem in both site location for the spent shale and in revegetation.

We personally witnessed the Forestry Service revegetation test plots as almost utterly bare, crusted with white surface slats, leached from the spent shale beneath. This project concluded that without considerable care, natural revegetation and surface rehabitation does not occur. This land would then be irretrievable to future generations.

I see no sense in kidding ourselves. The current direction of this nation demands the development of the oil shale resource. Revegetation is one of the most major problems facing the industry and us, the residents. For long after industry has left Piceance, we'll be left with the spent shale tailings. We feel that some long-range method must be made to guarantee to us that the revegetation left behind after the industry is gone is monitored until it is satisfactorily proven that nature has reclaimed the dump sites and that the natural cycle of revegetation has taken over, if this ever actually occurs.

This is a problem that must be worried about at the

beginning and not left to our great-grandchildren to resolve just because they may have the great technology that we do not possess today. True, we're looking at the termination of a project that may well last 150 years. But if we don't worry about the problems today, our grandchildren may find the problem too monumental to solve in the future. The ultimate protection of the environment of Piceance in the year 2122 must start with us here today. These problems outlined cannot be hand-me-downs to future generations. We are victims of that philosophy ourselves.

Many of us seem to be terror-stricken at the quantities of water mentioned within the Draft Environmental Statement as being necessary for the production of oil shale. These quantities almost equal all the water that flows through the Town of Meeker in the WhiteRiver on an annual basis. That is a lot of water. Between the Eastern Slope and oil shale, there's not going to be much water left.

Now, there are statements within the Draft that would, and do, generally tend to lead the reader to conclude that the area really isn't worth much. Phrases like "semi-wilderness" and quote "The slopes and many upland areas commonly expose bare rock cliffs, and ledges with little or no soil development. Other gently sloping upland areas contain this poorly developed soil." And, "Locally playa lake areas are covered by a salt pan where no vegetation grows.

And, "On the higher ground of the Roan Plateau in Colorado and Utah there are restricted areas of Douglas Fir and aspen forrest growth." And still further, "For the most part, however, the terrain within the oil shale basins offers a gently rolling hill or flat plain view that has attracted little attention aesthetically," unquote.

These statements are misleading. The hunters and visitors that I've escorted into the Piceance Basin have expressed the awe at the aesthetic beauty of the region. And a big city slicker from Los Angeles, like me, thinks the Piceance Basin is pretty close to heaven when you compare it with skyscrapers, wall-to-wall houses, concrete canyons, smog, and people pollution. The only reason the Basin hasn't attracted any aesthetic appreciation is that there is no major thoroughfare within the Basin itself. It's off the beaten track -- or it used to be, until oil shale.

Further on in the Draft I ran across a statement, "However, there is some hunting of deer, antelope, and game birds within the oil shale region itself." The fact is that the Piceance Basin is habitat for the largest migratory herd of mule deer in the entire United States. Last year alone some 5,500 deer were harvested by hunters from this region. The only reason the figure wasn't larger is a lack of knowledge by out-of-state hunters on the quantities of deer harbored in the Basin during the season.

More specifically, in Volume I, Chapter II, on Pages 75 and 76, under the heading of Wildlife and Fish Resources, we find no mention of the fish resource within the locale. I hope this is just an error that will be corrected in the final draft. There may not be an over abundance of fish within the Basin, but some of the hearwaters sport the very best game fishing in the western world.

Our hunting and fishing are a viable industry to us that we do not want to lose. We can put all our monetary eggs in the one basket of oil shale. Oil shale is here today and will be gone in the future of tomorrow. We must have a diversified economic base from which to operate our communities. If we don't, Meeker and Rangely will become ghost towns when the oil shale boom is over. We don't want this to happen. And, as elected officials, we cannot allow this to happen.

And we're going to have to have Federal and state help and the help of the oil shale industry in order to prevent this future occurrence. The first act of prevention should be to make sure that our deer herd and other wildlife, fish, and agricultural resources, remain in tact, wherever possible. For these are the things we are going to have to rely upon for our communities' economic base when the oil shale is gone.

One of the saddest things that is going to occur

is that the projected open pit mining takes place right in the heart of Game Management Unit No. 22, right in the middle of the mule deer herd. This, unfortunately, is one of the few areas where the shale lays so close to the surface that any other method of mining is totally impractical.

On the lighter side, in Volume I, I found the statement, "Some of the country's better ski areas are located near Snowmass, Aspen, and Vail." I seriously question the phrase "Some of the country's better ski areas." Our far eastern and European friends regard this area as one of the best ski areas in the world.

Up to now I've been trying to make the point that rather than try and sell oil shale production, the Draft Environmental Statement should address itself to facts rather than indulge in misleading semantics by trying to paint a bleak picture of the oil shale terrain.

Now, according to the Draft, there are no historic sites listed for Rio Blanco County in the National Register of Historic Places. True, but the statement is again misleading. The Rio Blanco County Historical Society is rather an infant group which is about to incorporate. There are many sites of historical value within Rio Blanco County, and we are discovering more each year. We've just finished the first major project of compiling a book of Rio Blanco History. There is already sufficient information to write a second

volume. All this activity has led to an awakening of the historical places and sites within our County that went unnoticed up to the writing of this first book. Just because the historical sites aren't listed yet is no sign that they don't exist.

It just boggles my mind that the production of 1-million barrels a day of oil from shale will cause such drastic irreversible consequences upon the nice, quiet town of Meeker, Colorado.

In my reading I found a very interesting statement to the effect that the surface disturbance from underground "room and pillar" mining can be identical to that of open pit mining, providing that the oil shale is not put back into the hole. In total, according to the Draft, some 50-thousand acres will be affected in the overall effort to produce 1-million barrels of oil from shale each day. Add to this 20-thousand irretrievable acres for urban development and 10-thousand acres for utilities -- soon we see upwards of 80-thousand acres affected by this project. And this does not take into account the development of oil shale on the 1-million acres of private oil shale lands.

The impact of people pollution, according to the Draft, is just going to be phenomenal. 30-thousand temporary employees by 1977; 47-thousand employees by 1980. And Meeker's water system is now at maximum utilization and with the sewer

facilities not too far behind. We've no tax base to stand the cost of updating and increasing these capacities, to meet the needs of an expanding population that the Draft Environmental Statement predicts will be upon us starting this coming spring.

This is not to mention that we already have a critical housing shortage in Rio Blanco County to start with. Housing is our most important and immediate problem. So I ask the oil shale industry, when you are in Washington, signing these lease agreements, why don't you send representatives of the oil shale industry over to HUD to start action on obtaining some housing start grants for the area? All these workers are going to need houses, and we'd best get started on the task this very coming spring as soon as the weather permits. If we don't, we can never expect to meet the needs of the people associated with the development of the industry.

Rather than go on point by point, I can sum up the remainder of our comments in the Draft this way. Throughout the documentation we find a magnificent job of inventorying all the problems and impact that we're going to see for the next 12 or 13 years. But there is sadly lacking any mention of solutions to all these problems.

Both the Federal Government and the oil shale industry are going to have to pitch in and hald us, in local government. We need an immediate fund for a paid professional

staff for both the town and the Planning Commission, and this is over and above the effort that is being conducted. We have a nice town, and we'd like to keep it that way. But we have insufficient funds and are unable to float sufficient bond issues to meet the demands the Environmental Statement indicates is about to impact upon us. We have plenty of homeowrk to do right in our own backyard, and we'd better get busy.

Many people are going to start arriving in our area next spring. What good is a town without adequate water and sewage facilities? What good is an oil shale industry if the workers haven't any place to live or are forced to drive long distances? What about schools for the kids or sufficient police protection? With the coming of this influx of people, the only way to stay on top of the crime problem is to hire more policemen for the force before the actual increase in the population. But again, we don't have the tax base to support the increased police staff.

This Draft Environmental Statement is telling us that we, in Rio Blanco County, are facing irreversible, irretrievable affects upon all our resources. That we are facing mandatory organization which is the direct result of the development of the oil shale program. The Draft defined the problems and problem areas for us in rural Meeker and Rangely, and we need men to find solutions before they become

a reality, to solve the problem before it becomes actual fact, and this will result in tremendous saving to everyone concerned. To let the problem get out of hand only results in increased taxes, and increased taxes mean increased rentals, increased house payments, and a corresponding demand by the employees of the oil shale industry for an increase in wages to cover the increased local taxes.

From what I have read, I conclude that the production costs of oil from shale is already quite marginal, and that a simple 25-cent an hour raise in pay could well wipe out the economic feasibility of competitive production. So, it's a game of ultimate cooperation that we're all going to have to play, and it's the only game in town.

I've done my best to cover all three volumes in as much detail as this week would permit. I'd like to make a personal observation; that is, that the title of the Draft is incorrect -- it should be entitled, "Draft Environmental Statement for the Proposed Portotype of Frankenstein's Monster." The Department of Interior must be congratulated. This is indeed a detailed and one of the best Draft Environmental Statements I have ever read, and I've read quite a few. And I assure you, it is without a doubt the horror story of our century. And I am personally very grateful for this therapeutic shock value which it had upon our heretofore quiet community.

A question for thought: What would happen to the

consumption of petroleum products by automobiles if we put the top speed from 70 to 50 miles per hour?

I thank you for the opportunity to present our views.

JUDGE RAMPTON: Next is Nyla Kladder of the Audubon Society.

MS. KLADDER: Mr. Chairman, panel members. I'm Nyla Kladder, president of the Audubon Society of Western Colorado.

There are three points we would like to have considered in the decision as to whether or not to proceed at this time with the proposed plan.

Number one, is there a need at present for the oil from these reserves?

Number two, would the problems created by the sudden increase in population in these areas offset any economic benefits to the communities involved.

Number three, how much actual damage will be done to the environment by these plans?

With regard to Item one, is there a need now for the oil from these reserves? We think that a national energy policy should be established in order to better clarify the relationship between needs, demand, production and reserves of various types of energy. Perhaps these reserves could better be used for the production of chemicals. There should be more research into other sources of energy, such as solar

power, tidal, nuclear, geothermal, fusion, et cetera. Let's not jump into the development of such an environmentally damaging industry until better recovery methods are developed and environmental problems are more fully investigated.

Number two, will the economic benefits be offset by the problems created for the local communities? Will the added source of income to these communities and businessmen be offset by the need for new roads, new schools, additional utility lines, electricity, housing, domestic water and water treatment plants, sewage disposal plants, additional law enforcement problems, et cetera? A sudden influx of population would hamper orderly, high-quality planning and development. When this temporary population has moved on, who is left to pay for this?

And, Number three, which we view as the most important, what is the possible damage to the environment in these areas? Not only would the above-mentioned influx of people cause many economic problems, but it could cause considerable damage to the environment and consequently to wildlife. In the Piceance Basin the development of a community with related facilities would not only take up desirable habitat for game animals, but much of the wildlife does not tolerate close association with man.

From reports I have read, it is my understanding that the volume of spent shale rock would be as much as two

point five times that of the solid rock with this residue being a highly alkaline black dust. The percentage of ore is calculated at 13 percent and waste at 87 percent. This creates a sizable problem in disposal. One source calculated that by 1968 (sic) the six prototype productions could be producing 1,125,000 tons of waste per day, requiring 1,160,000 acres per year -- over a 20-year period it might require 23,200 acres.

Apparently the results of experiments on reestablishing vegetation on these tailings have not been encouraging -- requiring much water and fertilizer to promote growth, and tender loving care after it is established. Many of our native species will not even tolerate the tailings, notably Mountain Mahogany and good deer forage.

I have read of one proposal to fill in dry canyons with the waste, compacting it with heavy equipment to only 130 percent of its original volume. This would require dams below the oil shale terraces to prevent rain from leaching salt into rivers. The water from these dams theoretically can be pumped upstream to be recycled to the plants. But when this operation is over, who will see that the ground cover gets the tender loving care it needs, and who will be responsible for maintenance of the dams and recycling of water? Probably the same people who are trying to figure out how to pay the taxes to cover the other improvements made.

We do not say oil shale development should not be, but we think many of these problems should be more thoroughly investigated and further development for the present should be done by companies on their privately-owned properties until such time as the recovery of oil from shale is greater, until there has been time for the development of a national energy policy, and until the environmental problems are resolved. When the answers have been found, then lease out the public land. But they should be leased at a competitive price and not given away.

That's all of my statement, but I do have another one to read.

JUDGE RAMPTON: Yes.

MS. KLADDER: This is the statement of Doctor Ira J. Kowal. He is a cardiologist in private practice in Englewood, Colorado, a member of the Arapahoe Medical Society, and co-chairman of it Environmental Committee.

"As a private citizen, I have all too many misgivings about numerous aspects of oil shale development in Colorado. However, my role today is to express, as a concerned physician, my medical society's feelings about specific medical problems that we foresee and which we feel have not been adequately worked out to date.

"It will come as no surprise to this committee, I'm sure, that there is a 'crisis' in medical care delivery at

the present time; furthermore, this crisis has never been more evident than in rural America, and even that much more evident in the part of Colorado that may become the site of oil shale development and production.

"Citizens of Colorado, the United States, and the world have all witnessed the plight of the people in Eagle Valley, a place not dissimilar in many ways to Rifle and Meeker -- in their inability to obtain and keep a physician in their community.

"A recent study in The New England Journal of Medicine, March 16, 1972, one of the most esteemed medical publications in the entire world, estimated that 133 primary physicians such as internists and pediatricians are necessary to care for a population of 100,000 people, irrespective of the need for mental, obstetrical, and dental needs, and excluding considerations for routine physical examinations. This study went on to show that only 59 physicians are currently available per 100,000 people throughout the United States as it is.

"Current estimates of an influx to Rifle, Colorado, alone, without consideration of other localities, of 9,500 new people would suggest the need for approximately 13 new primary physicians in order to deliver adequate primary health care. Once again, to the Rifle area alone. While no figures are available, one can easily be assured that secondary expertise in the way of surgeons, gynecologists, orthopedic surgeons, and

other specialty areas will also, to some degree, be a necessary concommitant. Yet currently there are only three physicians in Rifle, none of whom is a pediatrician.

"We ask the following questions and believe that answers are necessary and almost mandatory before a large project such as oil shale development production can be permitted:

"1. Is there a plan to meet the need for adequate primary and secondary medical care?

"2. Will this plan stand review by knowledgeable experts?

"3. Where, and how, will additional hospital facilities be built in an already over extended and troubled situation as currently exists in Rifle alone, to say nothing of other similar communities?

"4. How can physicians be expected to set up practices in an area as impermanent as this 10-year project would evidently become?

"5. Can we condone such a project without the above-mentioned prerequisites being met?

"In a time when health care delivery has reached crisis proportions, largely because of a shortage of physicians, and allied health personnel, we are now confronted by a massive inroad on an already over-taxes medical community. No viable solution to this problem has been suggested by the developers, and past experience dictates that a solution must be advanced

to avert a potential medical catastrophe."

Thank you.

JUDGE RAMPTON: Thank you.

Our next is Bob Chancellor.

MR. CHANCELLOR: Ladies and gentlemen. My name is Bob Chancellor. Although I headquarter in Denver, geologic work carries me often to the Western Slope. I am a vice president of Rio Blanco Natural Gas Company, but I'm speaking here as an individual.

My company made detailed formal comments in Denver earlier this week concerning the Draft Environmental Impact Statement on oil shale. Denver is where things are done formally. My personal opinion is that what went wrong with this whole business the Interior Department is proposing to do regarding the much-needed oil shale came about by having things a little too formal. As we used to say in the Navy, "Things can't be this fouled up by accident; someone had to plan it this way." I don't say this is all the fault of the Interior Department.

There is a sensible way to go about having the mineral wealth of Western Colorado help solve the nation's energy problems. That way is in having every useful project go forward without conflict from any other. The challenge of the nation's energy shortage cannot abide bleeding hearts or cheap politics. We must roll up our sleeves and develop

a system of priorities.

The gist of my company's remarks in Denver concerning oil shale was that we couldn't understand why the Department of Interior hadn't ever let us know they wanted to start mining oil shale on a block of land within which our company owns 40 percent of the oil and gas leases and in an area where a number of us smaller independents have been actively engaged in the search for natural gas, and oil. Those of us that have had the frustrating experience over many years of drilling for gas in Western Colorado and running into thick pay zones with a lot of gas reserves but too tight to give it up know that the gas is unquestionably here. A whole bunch of gas. The experts tell us that there's enough gas in the Rocky Mountains to double the nation's reserves.

Every now and then we have run into some excellent gas producibility, but too often we have been stymied by little or no market for the gas. Those things are all changing. Now, just when we are on the verge of solving our producing and marketing problems, what happens? The Interior Department comes out with a thousand-page document, printed on 50 different typewriters, and all spluiced together in obvious haste. That document tells us directly and by inference oil shale is the only answer to all the energy problems, and that if we producers of natural gas and oil get in their way, they'll run us over. At the same time, they list enough uncertainties and enough

possible changes in the environment connected with oil shale to scare any reasonable man out of his senses.

One of the ways of getting natural gas out of the ground is by nuclear stimulation. There have been a lot of opinions on the environmental impact of drilling nuclear and conventional wells and nuclear wells for gas. Some of these opinions apparently have made certain of the Interior Department executives real nervous. It is strange that they are nervous since all the government's scientific agencies who have worked on this project think it is progressing safely and properly in a careful series of steps.

Compared to the minor environmental impact of conventional or nuclear stimulation for gas, the proposed oil shale program could be -- understand, I did say could be -- something else again. With oil shale maybe we're going to eventually relandscape Western Colorado -- make it like your front lawn. That is, after maybe we've torn it up, filled it in, smoothed it out, and maybe raised the salinity of the Colorado River, and maybe allocated all the water on the Western Slope to oil shale extraction for an unknown period.

Don't get me wrong. There's lots of maybe's here. It could be that in the national interest this is necessary and desirable. In the meantime, I think decision-makers in the Interior Department should get back with their oil shale promoting buddies and decide to keep us poor boys in the game.

After all, we have been and are producing much-needed natural gas and producing it out of something other than a pilot plant.

Heaven knows, on the Western Slope we love oil shale. Dreams of the coming oil shale bonanza have been Mom and apple pie to us. Those dreams have also sold a lot of newspapers. Maybe those dreams are going to come true -- millions -- billions -- trillions.

But don't let's put all of our eggs in that oil shale basket. Don't let's kill off a gas search that's coming on strong and that Government experts say could be at least half as big as the oil shale might become; a gas search that involves a lot of less trouble for all concerned, including elk, deer, grouse, rabbits, juniper, native grasses, and last but not least, the human beings on the Western Slope. Human beings who want to make a living without any drastic changes in the countryside unless those changes are really necessary. Let's get oil shale started on private lands where we can develop some economic parameters for leasing public lands and eliminate any possibility of Teapot Dome claims.

While we're at it, let's bring some of these suburban Denver so-called environmentalists to some of the places out on the Western Slope where we're drilling for gas and working on oil shale. Out where the jack rabbits carry their lunch boxes. Let's leave them out there for a few weeks to interrelate with the alkali dust and sagebrush and

the rattlesnakes. Let's help them to some true sense of comparative values so that reasonable approaches can be taken to the extraction of the hydrocarbons in Western Colorado.

There are a lot of men in Grand Junction who have fought the hard fight in Western Colorado, searching for oil and natural gas and working on oil shale. I didn't see any of their names mentioned as being consulted by the Interior Department executives. And I'm going to believe that what happened, they got the cart before the horse. We should have had and then written the Environmental Impact Statement.

JUDGE RAMPTON: Thank you.

Our next witness is Pat Halligan.

MR. HALLIGAN: First I think it would be appropriate to commend the Department of the Interior for the high quality work that went into the preparation of the Impact Statement which is under consideration here today. The question before us is a hard, tough one, and decisions that will ultimately be reached will not please everyone. The Department has, however, done a good job in alerting us to some of the problems and prospects associated with oil shale development.

Without question, the development of oil shale will have an impact on the physical environment of Western Colorado. But the impact on the economic fiber will be just as strongly felt. This impact will not be restricted to a relatively small portion of the State of Colorado either for it will be felt

throughout this nation. We may have to carry the burden of our actions here for a long time, so it is imperative that whatever decisions are made must be right. The stakes are too high for them to be otherwise.

Western Colorado is in the fortunate or unfortunate position, depending on your point of view, of being the location of some of the richest deposits of this mineral in the world. However, Western Colorado is fortunate to be in the location of some of the most beautiful and properus and natural environment to be found anywhere. I am not here to advocate nor to condemn the processing of oil shale. But the question of whether or not industrial development of the magnitude of projected in the Impact Statement is compatible in this atmosphere must be answered.

Further, the question of whether the national good will be served best by exploiting the resources or whether the nation would be better served by leaving the area intact must, too, be dealt with.

If the decision is made to proceed with the oil shale leasing program -- or with private development, for that matter -- the problems already facing city and county governments in this area will be compounded. This is my concern as a professional planner, and I would introduce myself here now. I'm Pat Halligan, H-a-l-l-i-g-a-n, director of the Oil Planning Commission. I am one who has had the

good fortune to be employed by three of the counties that will feel the impact and burdens of development the most. Housing, transportation, recreation, water resources and quality, and education are just a few of the areas about which elected officials are expected to make sound decisions. Taxpayers expect a high quality delivery of service from government, and yet delivery of service at the local level is constrained by the financial resources available.

Therefore, if the leasing program does proceed, then it seems to me that the Federal Government has an obligation to consider this as a kind of impacted area and one which should have a high priority as far as assistance for various planning and construction grants is concerned.

With the influx of people into this region that oil shale development would bring, the governmental institutions here will need help. We will need help from both Federal and State agencies, but not the mind-boggling, frustratingly bureaucratic red-tape-bound kind we have been subject to in the past. We have had enough of that, and it has served no other purpose than to fractionalize and dilute the efforts of all concerned with the development of Western Colorado.

Rather, aid in the form being provided for example, by the cooperative efforts of the State, the Department of the Interior, and the oil industry is the kind of enlightened help that is and will be the most beneficial to this area.

Industry certainly has a role to play here as well because your employees must be adequately provided for if you expect top performance from them. If the leasing program does not proceed, you still present us with the prospect of developing your private holdings, and the impact on the area will be just as great as will your obligations.

This has not been intended as a whining cry for help to anyone, but rather a statement of fact, that if you -- State, Federal, industry -- are going to be part of the problem, you had better be prepared to be part of the solution. Do not expect miracles from elected officials who don't have the financial wherewithal to make immediate decisions regarding inflated demand for services as a result of the occurrence of heavy industrial development unless you are willing to help pay the cost.

JUDGE RAMPTON: Thank you, Mr. Halligan.

This completes the list of witnesses or participants, or those who have pre-registered. We passed up two because no one responded when I called their name. I will now call them again. Is there anyone here who represents the Aspen Wilderness Workshop? (No response.)

JUDGE RAMPTON: Anyone from the Environmental Task Force, Aspen, Colorado? (No response.)

JUDGE RAMPTON: Is there anyone who has not registered who wishes to make a statement at this time?

Would you step forward? State your name and who you are associated with, please?

MR. ROADIFER: Members of the panel. My name is Jack Roadifer, R-o-a-d-i-f-e-r. I do not represent any group or organization or company, but simply myself.

I'm appearing here today because I'm a concerned resident of Western Colorado, and I think more residents of Western Colorado should be concerned about this program that is being studied.

I would like first of all to say that I share the opinions expressed earlier today, that the availability of the Environmental Impact Statement and the time allowed is not sufficient for the average citizen who does not have the time to sit down with some other people involved in the company, perhaps, to make an evaluation of this kind of a volume -- a three-volume statement of this sort. A week or ten days allowed for that is simply not enough time.

However, in looking over this particular Volume III of this Statement in which I looked at the most, I feel that I would like to direct a few remarks to that part of the statement. And having a Ph.D in geology, I think I am somewhat qualified to remark on some of the statements that are in that document.

First of all, I think that there are many uncertainties that still exist in this program as outlined, particularly in

regard to some things that I think are very important parts of the program. That is availability of water. Several places in the section dealing with impact on water in Volume III there are statements made to the effect that it really isn't known where the water will come from. Whether or not the water that is saline that may be recovered from the de-watering process of open pit mine, for example -- it's not known if this can be used in the process to help dispose of spent shale, or whether it can be used in other parts of the process.

It seems to me things like this should be investigated further before this kind of full-scale program is developed.

It also is stated in the same section that there simply isn't enough data available at the present time to predict the amounts or types of material that may be leached from this spent shale by ground water. It seems to me this is another thing that should be investigated further before any kind of a full-scale program is developed.

There are other inadequacies I think that exist in the Statement as far as the water program -- the waterpart of the program is concerned. I further don't think that a realistic evaluation has been made of the problem of disposing of this spent shale. We see in the impact statement several plans and discussions of disposing of the spent shale in several canyons in the area, particularly dealing with the

one tract designated as Tract CA, the three or four canyons east of the Douglas Pass road, which supposedly would be filled in with this spent material. And we all know that this material is going to be very errodible. And I don't think this has adequately been discussed in the Impact Statement, of how this problem is going to be dealt with or this spent shale is going to end up eventually.

I think it doesn't take too much imagination to visualize this 60,000 tons per day of shale that has to be disposed of from one 50-thousand barrels site ending up in the White River, the Colorado River -- eventually perhaps, to another monument to an engineer, Lake Powell.

In the 30-year period we're talking about, 484 cubic yards of processes shale. Those figures simply don't mean much to me. They just boggle my imagination. I can't appreciate the amount of material involved there, frankly. I wonder if anybody else can.

In addition to that, we're talking about 256 cubic yards of overburden removed from this particular site if the open pit operation is used. Another figure that doesn't mean much unless we're used to talking about Federal deficits of Federal budgets. I can't appreciate such figures.

We all know we're talking here about steep gradings in these canyons. The streams -- these are dry canyons, admittedly except after a rain, of course. But the water that

does come down these canyons after the occasional heavy rain comes down these canyons with a pretty steep gradient and I think it's going to be pretty difficult to hold the materials in the canyons.

We're also talking here about perhaps a 20-to 30 year period before revegetation becomes effective. Revegetation has been accomplished on small tracts of spent shale materials. Perhaps it can be accomplished on large tracts. We are looking at fuel material that is simply miles long. But I don't think this has been fully evaluated, either.

Another part of the Impact Statement dealing with the impact on air. The statement is made that 57 to 85 tons per day of sulpher, 21 tons per day of nitrogen dioxide and perhaps 40 tons per day of dust may be admitted from each mining surface complex. Well, this is only one side. If we have a full-scale development, we're talking about maybe 10 sites. We can multiply the numbers by ten.

It further says that the impact investigation on emissions has yet to be established. Well, for a person who lives here in Western Colorado, I think these are things that we should certainly be wondering about, at least. What impact is all this air pollution going to have? What impact from the silt and stuff getting into the river is going to have? And I don't think the questions have been answered very satisfactorily.

I further think that strip mining or open pit mining, whichever term is preferred, should be discouraged in spite of the scenic vista that might be created by such an operation. We all know from experience in the other parts of the country, in Appalachia, particularly, that strip mining creates an area that is very difficult to revegetate, very difficult to bring back to any kind of a situation even approximately what it was before. We're talking about an arid region where it is even more difficult.

Well, in effect, I could sum up by saying that I think if an oil shale program of this magnitude is developed that I hope that very strict controls are exercised over this program, and I hope that there's authority available to somebody to shut down an operation that does not control emissions, that does not comply with the standards that are set up. But we all know how difficult it is to stop something like this that gets started. Such as the Four Corners power plant where we were assured before that started that there wouldn't be any significant air pollution. A person becomes a little bit suspicious of the assurance after a while.

We were also assured that there wouldn't be any significant effects from uranium plant tailings, but now we don't know whether there are or not.

Perhaps a prototype program of this type is the only way to evaluate the factors. Perhaps there's no other

way of telling what the effects will be of some of the things until a prototype program is started. But once a program like this is started with the ensuing jobs -- the people are brought in and the money is brought in and so forth -- it's very difficult to end a program like that regardless of the effects from it.

Thank you.

JUDGE RAMPTON: Thank you, Mr. Roadifer.

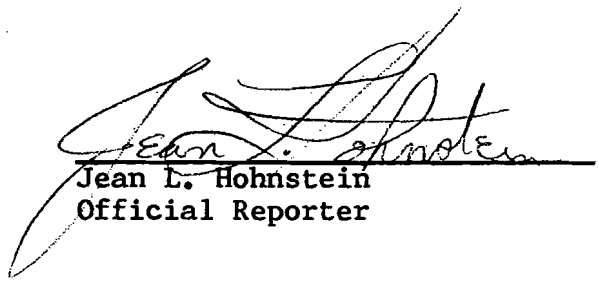
Is there anyone else who has a statement? If there is none, then I'd like to thank you again for myself and for the panel for your courtesy, for your attentiveness, and for the time and effort you put in to prepare these statements.

And I declare this session closed.

(Whereupon, at 1:30 o'clock p.m., the hearing in the above-entitled matter was adjourned.)

REPORTER'S CERTIFICATE

This is to certify that the attached proceedings before the Department of the Interior in the matter of: DRAFT ENVIRONMENTAL STATEMENT FOR THE PROTOTYPE OIL SHALE LEASING PROGRAM, at Grand Junction, Colorado, Friday, October 13, 1972, was held as herein appears, and that this is the original transcript thereof for the file of the Department.



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Official Reporter

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