Correspondence – Sierra Club

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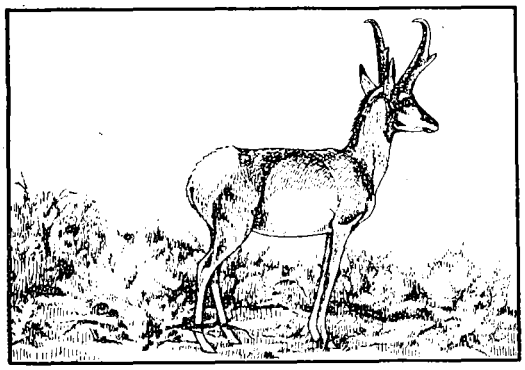

Sierra Club NORTHERN GREAT PLAINS OFFICE
Post Office Box 721, Dubois, Wyoming 82513

19 August 1974

Governor Jimmy Carter
1974 Campaign Chairman
Democratic National Committee
Box 1524
Atlanta, Georgia 30301

Dear Governor Carter:

Mike McCloskey, Executive Director of the Sierra Club, sent this office a copy of your July 16 correspondence with him requesting information on issues of concern to the Sierra Club. We are sending you a copy of a speech I presented in North Dakota which most completely lists our concerns and priorities in the Northern Plains region.

It is our hope that the Democratic Party will consider this issue of energy development in the West when nation and regional platforms are formulated. It is an issue which has serious national ramifications and long-term effects. If you have further questions, please do not hesitate to contact us.

We greatly appreciate your interest.

Sincerely,

Laney Hicks

Ms. Laney Hicks
Northern Plains Representative

THE FUTURE OF ENERGY DEVELOPMENT IN WESTERN STATES

by Ms. Laney Hicks
Northern Plains Representative, Sierra Club

Energy Conference
North Dakota Academy of Science
April 25-27, 1974

The future of energy development in the western states ranks close to the hottest issue at federal, regional, state and local levels. Debates on this topic have a higher Btu value than the resource under discussion and at times I think more potential to generate smoke than either heat or light by simplistic approaches such as national energy demands, jobs, growth and even motherhood.

Certainly I am honored to have the opportunity of addressing your conference as an opening speaker but I must express some uneasiness at the responsibilities that go with that position on the program. I have an hour to spread before you the issues, impacts, arguements, choices and philosophies inherent in the future of energy development in the northern plains. That's enough time to put some people to sleep and to hang myself twice over.

I thought I could start out by saying the issue is clear...we have coal and someone wants it. Maybe that is adequate as a general statement of the problem but it breaks down almost immediately upon inspection. I wish I was one of those talented government bureaucrats who could draw an organizational chart with a pretty little decision coming out at the bottom. Unfortunately my organizational process resembles an energy flow chart with all those feedback systems which tend to make them unintelligable to all except the scientist who constructed it.

Not only are we dealing with measurable costs, benefits, shifts, impacts and so forth, but also immeasurables like social and philosophical structures and the function of language in reporting and selling certain ideas.

The generalized national public debate on energy obscures the decisions being made or ones that are in the process of formulation. It is quite possible to go on making decisions without articulating overt policies or plans and in fact some people seem to prefer that method. Subtle commitments on agency funding and tax structures, for example, can guarantee directions of development which do not flow out of any policy or program. And in order to get any insight into the future of energy development, one has to go behind and beyond the publicity of politicians and special interests. I will try to give an overall

picture as I see it, but it may be more important for me to suggest conflict areas, choices available and question some goals.

The thought occurred to me that there was a potential to make up a speech with nothing but questions which I can't answer. But I have discarded that approach in favor of a middle ground somewhere between the intricacies of small problems and the national cliches about our role to help supply the rest of the nations energy demands. That demand as represented on the traditional graphs is mind boggling in terms of technology, capital investment and cost to the consumer in dollars, his environment, food production and most of the renewable resources in areas of production.

I don't think there are many who would deny that the highly developed society we have today was built with an energy based technology and we all enjoy the benefits derived therefrom -- but as in almost every cycle we appear to be reaching a point of diminishing returns. This is a time of change and resource competition and problems are on the increase. These conflicts need not be considered in a negative sense for very few issues are resolved in an adequate manner where the expression of disagreement was excluded. Different viewpoints are needed but their ultimate value appears with what happens after they are expresses. We can let the strongest and wealthiest view win or we can try to reconcile the views through public involvement. The latter is by far the most difficult.

Assuming the latter approach interests you my strategy is to take a few basic problems and trace their implications, present activities, interrelationships and explore some of the choices available and questions I have that we might all work on together.

As a base let me start by generalizing my perception of the northern plains. The five state area - Wyoming, Montana, North and South Dakota and Nebraska - is basically agriculturally oriented, our air is better than most parts of the country, our rivers are fairly clean and the financial status of the state governments is relatively healthy compared to some states. There is the usual desire to grow...tax base, new industry, etc., but we don't have a situation where we would be bankrupt if growth proceeded at a slow to moderate rate in contrast to the rapid development of energy predictions. The ranch-farm industry, especially the family farmer, is having a struggle and does need assistance and support. In comparison to other areas, we have low populations and for the present resource uses perhaps an optimum population.

This five state area was coasting along rather quietly until a few years ago when the energy industries started leasing coal. Then in the last year or so there has been a series of rapid blows and threats - large power plants, gasification plants, strip mines and water sales. I feel like I have walked straight into that vertical curve of exponential growth...I recoil with a

severe headache and nausea. All of a sudden there are these tremendous development plans, not little dinky projects, but industries that will cost billions of dollars, use a great deal of water, pollute the air and bring in hundreds of thousands of new people.

I think my physical reaction is shared by most of the citizens in the area who are knowledgeable on the potential for industrial development. I start asking myself, now what? What is a proper reaction? Do we have to end up a dirty industrial area? What are the benefits and costs? The questions are endless but at this level they have one thing in common, we are being forced to question, because of the size and kind of development, the basics of our life style, our values and the realities of the future.

As announcements of industrial plants multiply in the press we are faced with a huge gray cloud of prospects that are difficult to comprehend and hard to tie down in terms of real live commitments as opposed to speculation. Without being too idealistic or run the risk of being labeled an environmental zelot (which will probably happen anyway) I think we have an obligation to argue with these promotional stories and philosophies if we are to understand our future and have a say in the direction it takes. I want to argue with several of them today to present some of the choices which are available.

In arguing with these industrial prospects, the basic issues are: air, water, land use, people and coal. With the exception of coal, all the issues are the basics of life and maybe the coal industry feels coal is too.

COAL

I might as well start with coal - it is the object of national, regional and local concern and the factor that will stimulate or retard the status and quality of the other four issues of air, water, people and land use.

In our immediate area a conservative estimate puts existing coal leases - private, state and federal - at between 2 and 3 million acres in Wyoming, Montana and North Dakota. A really precise number is almost impossible to compile as the private leases are not always recorded in county court houses.

Recent testimony by the Department of Interior reveals that under federal leases alone there are 10 billion tons of coal committed in the Northern Plains. (Horton, 1974) This does not include the federal prospecting permits and preference right leases or state and private leases. The figure on committed coal could be two or three times as large if these other numbers were included. Our present annual national coal production is 600 million tons and it is obvious that there is enough coal under lease in our area now to last quite some time.

The Northern Great Plains Resources Program is estimating coal

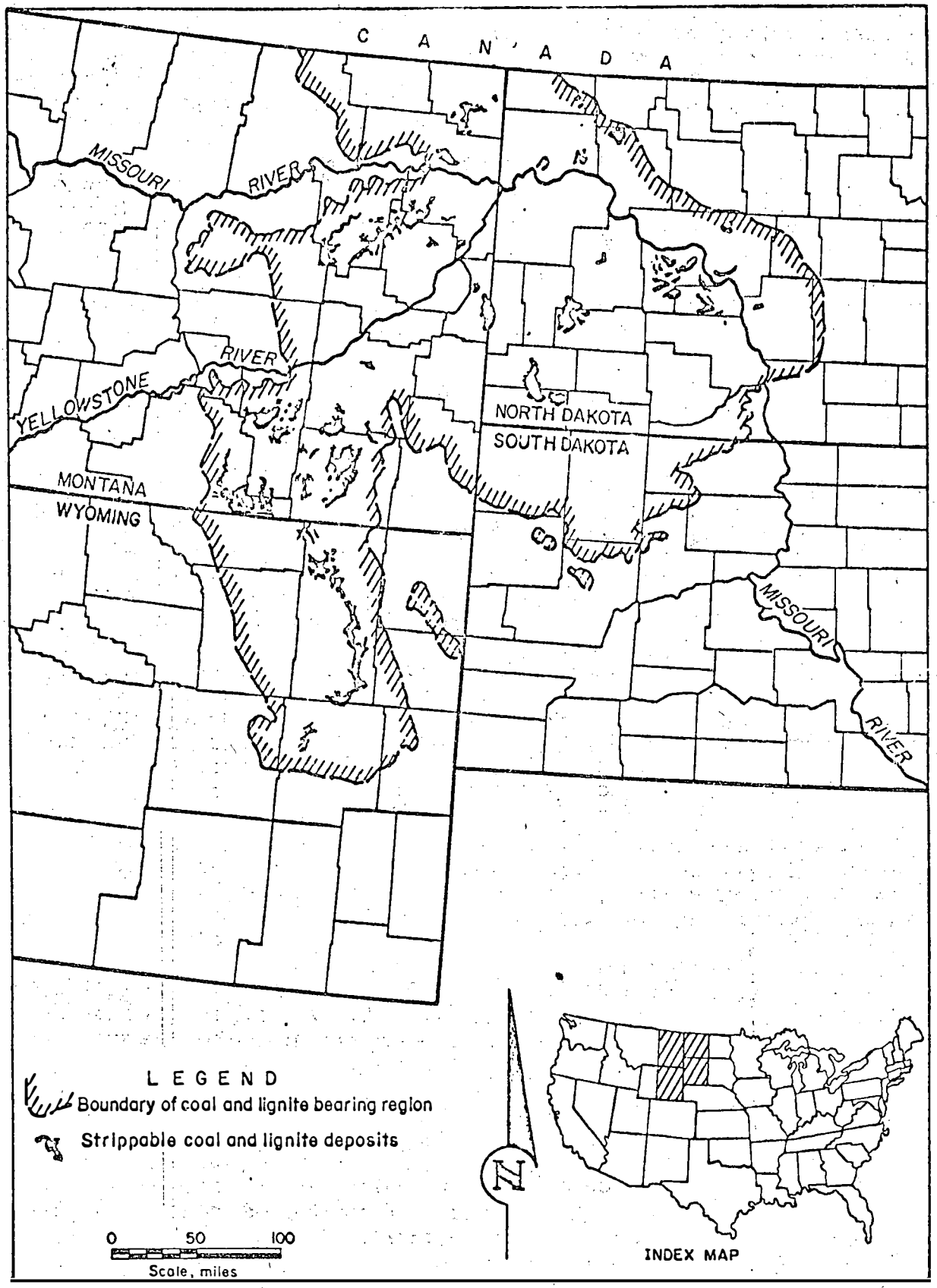

FIGURE 1. – Location of coal and lignite in Upper Missouri River basin.

"Impact of Environmental Policies on Use of Upper Missouri River Basin Coal, Lignite, and Water," Bureau of Mines Preliminary Report 188, March 1972.

production in this region by the year 2000 to be between 400 million tons and one billion tons a year. And a private industry consultant was recently quoted as saying that industry planned to be mining by the year 2000 twice the amount of coal as the highest estimate of the federal study, or two billion tons. The magnitude of this increase is significant when you consider that federal leases in 1970 only produced 7 million tons, and the coal reserves currently under BLM-issued leases were over 1000 times greater than coal production from Federal lands. The BLM claimed in a working staff draft on federal coal leasing, "that on a tonnage basis and at current rates of consumption and production, there is sufficient economically recoverable coal currently under Federal lease to supply this Nation's needs for the next 14 years." (BLM staff draft, 1971) (DP 10-31-73)

However, none of the existing leases has been evaluated on environmental grounds and perhaps it would be better to lease some new lands that had been reviewed environmentally and withdraw the existing leases which could cause detrimental impacts. In Wyoming, for example, it sounds much better to keep mining localized around Gillette than to string it out along a 100 mile strip from Gillette to Douglas. The strippable reserves in a ten mile radius of this town hold 7 billion tons.

Acquisition of western coal has followed an interesting pattern with many of the new lease holders being the international oil companies. The nation's largest energy producers began to acquire interests in the coal industry in the 1960's. Gulf Oil acquired the Pittsburg and Midway Coal Company, the nation's 13th largest coal producer in 1963. Three years later, Continental Oil bought the East's largest coal producer, Consolidation Coal Company. In 1968, Occidental Petroleum acquired Island Creek Coal, the 3rd largest producer, and Standard Oil of Ohio took over Old Ben Coal, now the 10th largest coal company. During this same period, Kennecott Copper acquired Peabody Coal, the largest coal producer and General Dynamics became the 11th largest when it bought Freeman Coal and United Electric Coal. The American Metal Climax Corporation purchased Ayrshire Collieries (Meadowlark Farms in the Central States) making it the 6th largest company. Presently, 11 of the 15 largest coal producers are owned by outside interests and 13 of the 15 companies control more than 60% of annual U.S. coal sales. (EPC, 1974)

In addition to these companies, other oil giants such as Kerr-McGee, Gulf, Sun Oil, Mobil, Atlantic Richfield, Carter Oil, Texaco and Tennaco have either bought coal leases, hold prospecting rights, requested or acquired water rights in the northern great plains. (IRRC, 1973)

The western strippable subbituminous and lignite coals are not the only coals available, nor are they particularly valuable. We have considerable room for choosing alternatives should the states assert some controlling influence.

A strong case can be made for using eastern coal - it has superior heat content, is closer to the market, there are large deposits of low-sulfur coals and there is an established labor force and

RATIO OF DEEP MINE, LOW SULFUR COAL TO STRIPPABLE, LOW SULFUR COAL, BY STATES.

(units in millions of tons, sulfur content 1% or less)

BITUMINOUS COAL	TOTAL RESERVES	DEEP MINE, LOW SULFUR RESERVES	STRIP MINE, LOW SULFUR RESERVES	RATIO, DEEP LOW SULFUR TO STRIP, LOW SULFUR
APPALACHIA				
ALABAMA	13,577.8	2,045.5	33	62 : 1
E. KENTUCKY	29,414.8	21,599.8	532	41 : 1
MARYLAND	1,180.0	0	0	0
OHIO	41,024.0	611.0	0	0
PENNSYLVANIA	57,951.5	1,198.4	0	0
TENNESSEE	1,839.5	159.2	5	32 : 1
VIRGINIA	9,820.0	7,905.0	154	51 : 1
WEST VIRGINIA	102,666.4	46,333.6	1,138	40 : 1
TOTAL	257,474.0	79,852.5	1,862	43 : 1
INTERIOR AND GULF STATES				
ALASKA	21,387.4	20,907.4	480	43 : 1
ARKANSAS	1,615.8	0	3	0
COLORADO	62,415.5	61,915.5	500	123 : 1
ILLINOIS	135,889.2	573.7	0	0
INDIANA	34,841.1	370.5	0	0
IOWA	6,522.5	0	0	0
KANSAS	20,738.0	0	0	0
W. KENTUCKY	36,895.4	0	0	0
MISSOURI	78,760.0	0	0	0
MONTANA	2,104.6	269.4	0	0
NEW MEXICO	10,686.0	10,686.0	0	0
OKLAHOMA	3,302.8	1,022.8	10	102 : 1
TEXAS	7,978.0	0	0	0
UTAH	27,658.0	22,135.4	6	3689 : 1
WASHINGTON	1,571.0	1,571.0	0	0
WYOMING	12,819.0	12,819.0	0	0
TOTAL	465,184.3	132,270.7	999	1322 : 1
TOTAL BITUMINOUS	722,658.3	212,123.2	2,861	74 : 1
SUBBITUMINOUS COAL				
ROCKY MOUNTAINS AND NORTHERN GREAT PLAINS STATES				
ALASKA	71,115.6	67,189.6	3,926	17 : 1
ARIZONA	4,047.0	3,660.0	387	9 : 1
COLORADO	18,229.5	17,753.5	476	37 : 1
MONTANA	132,116.6	127,636.0	3,176	40 : 1
NEW MEXICO	50,735.0	48,261.0	2,474	20 : 1
WASHINGTON	4,193.8	4,058.8	135	30 : 1
WYOMING	107,903.9	94,518.3	13,377	7 : 1
TOTAL	388,341.4	364,390.4	23,951	15 : 1

RATIO OF DEEP MINE COAL TO STRIPPABLE COAL, BY STATE. (units in millions of tons)

LIGNITE	TOTAL RESERVES	DEEP MINE RESERVES	STRIP MINE RESERVES	RATIO, DEEP MINE TO STRIP MINE RESERVES
ARKANSAS	350.0	325.0	25	13 : 1
MONTANA	87,481.7	83,984.7	3,497	24 : 1
NORTH DAKOTA	350,698.0	348,623.0	2,075	167 : 1
SOUTH DAKOTA	2,031.0	1,871.0	160	12 : 1
TEXAS	6,902.0	5,593.0	1,309	5 : 1
TOTAL	447,467.7	440,401.7	7,066	62 : 1

RATIO OF DEEP MINE, LOW SULFUR COAL TO STRIPPABLE, LOW SULFUR COAL BY STATE.
(units in millions of tons, sulfur content 1% or less)

LIGNITE	TOTAL RESERVES	DEEP MINE LOW SULFUR RESERVES	STRIP MINE LOW SULFUR RESERVES	RATIO, DEEP, LOW SULFUR TO STRIP, LOW SUL. RESERVES
ARKANSAS	350.0	325.0	25	13 : 1
MONTANA	87,481.7	81,399.1	2,957	27 : 1
NORTH DAKOTA	350,698.0	317,438.4	1,678	190 : 1
SOUTH DAKOTA	2,031.0	1,871.0	160	12 : 1
TEXAS	6,902.0	0	625	0
TOTAL	447,462.7	401,033.5	5,445	74 : 1

SUMMARY OF COAL RESERVES OF THE APPALACHIAN STATES, ON JANUARY 1, 1965.

TOTAL	257,474,000,000 tons
DEEP MINE	252,303,000,000 tons
STRIP MINE	5,171,000,000 tons
DEEP MINE, LOW SULFUR	79,852,500,000 tons
STRIP MINE, LOW SULFUR	1,862,000,000 tons
RATIO, DEEP MINE TO STRIP MINE	49 : 1
RATIO, DEEP MINE, LOW SULFUR TO STRIP MINE, LOW SULFUR	43 : 1

SUMMARY OF COAL RESERVES IN THE UNITED STATES, ON JANUARY 1, 1965.

TOTAL	1,558,467,400,000 tons
DEEP MINE	1,513,512,400,000 tons
STRIP MINE	44,955,000,000 tons
DEEP MINE, LOW SULFUR	977,547,100,000 tons
STRIP MINE, LOW SULFUR	32,257,000,000 tons
RATIO, DEEP MINE TO STRIP MINE	34 : 1
RATIO, DEEP MINE, LOW SULFUR TO STRIP MINE, LOW SULFUR	30 : 1

RATIO OF DEEP MINE COAL TO STRIPPABLE COAL, BY STATE. (units in millions of tons)

BITUMINOUS COAL	TOTAL RESERVES	DEEP MINE RESERVES	STRIP MINE RESERVES	RATIO, DEEP MINE TO STRIP MINE RESERVES
APPALACHIA				
ALABAMA	13,577.8	13,443.8	134	100 : 1
E. KENTUCKY	29,414.8	28,633.8	781	37 : 1
MARYLAND	1,180.0	1,159.0	21	55 : 1
OHIO	41,024.0	39,991.0	1,033	39 : 1
PENNSYLVANIA	57,951.5	57,199.5	752	76 : 1
TENNESSEE	1,839.5	1,765.5	74	24 : 1
VIRGINIA	9,820.0	9,562.0	258	37 : 1
WEST VIRGINIA	102,666.4	100,548.4	2,118	47 : 1
TOTAL	257,474.0	252,303.0	5,171	49 : 1
INTERIOR AND GULF STATES				
ALASKA	21,387.4	20,907.4	480	43 : 1
ARKANSAS	1,615.8	1,466.8	149	10 : 1
COLORADO	62,415.5	61,939.5	500	124 : 1
ILLINOIS	135,889.2	132,642.2	3,247	40 : 1
INDIANA	34,841.1	33,745.1	1,096	30 : 1
IOWA	6,522.5	6,342.5	180	35 : 1
KANSAS	20,738.0	20,363.0	375	54 : 1
W. KENTUCKY	36,895.4	35,918.4	977	37 : 1
MISSOURI	78,760.0	77,600.0	1,160	67 : 1
MONTANA	2,104.6	2,104.6	0	0
NEW MEXICO	10,686.0	10,686.0	0	0
OKLAHOMA	3,302.8	3,191.8	111	29 : 1
TEXAS	7,978.0	7,978.0	0	0
UTAH	27,658.0	27,508.0	150	183 : 1
WASHINGTON	1,571.0	1,571.0	0	0
WYOMING	12,819.0	12,819.0	0	0
TOTAL	465,184.3	456,759.3	8,425	54 : 1
TOTAL BITUMINOUS	722,658.3	709,062.3	13,596	52 : 1
SUBBITUMINOUS COAL				
ROCKY MOUNTAINS AND NORTHERN GREAT PLAINS STATES				
ALASKA	71,115.6	67,189.6	3,926	17 : 1
ARIZONA	4,047.0	3,660.0	387	9 : 1
COLORADO	18,229.5	18,229.5	0	0
MONTANA	132,116.6	128,716.6	3,400	38 : 1
NEW MEXICO	50,735.0	48,261.0	2,474	20 : 1
WASHINGTON	4,193.8	4,058.8	135	30 : 1
WYOMING	107,903.9	93,932.9	13,971	7 : 1
TOTAL	388,341.4	364,048.4	24,293	15 : 1

economy in the east that depends on coal production. (Williams, 1974)

Deep mining also has a case. The longwall underground mining methods used in Europe recover 90% of the coal seam. Subsidence is controlled and planned. There are about 40 mines in operation using the longwall method and during their operation period in the U.S. there have been no fatalities. (EPC, 1974)

On the heat value of various coals, I wonder why western coal is attractive at all. The low-sulfur coal of Central Appalachia has four times the energy potential of the present reported strippable reserves of the northern plains and New Mexico.

The projections for coal demands is risky business at best. The Department of Interior in 1972 based their projections for coal using the heat value for bituminous coals. With those figures the accumlative demand for consuming sectors between 1971 and 2000 would be about 30 billion tons. (Dupree, 1972) If the lower heat value of western coal is used the figure jumps to 45 billion tons. (EPC, 1974) The Bureau of Mines has estimated for the northern plains that the strippable reserves in the ground are approximately 68 billion tons. Fifty four billion tons is potentially recoverable and 36 billion tons is considered economically recoverable. It wouldn't take long to use up the coal considered economically recoverable. The high scenario for the Northern Great Plains Resources Program projects the mining of one billion tons a year which would mine the resource in 36 years and the industrial estimate of two billion tons a year would give us 18 years to finish off this easily accessible coal.(BM figures, NGPRP, Mineral Work Group draft, p. 52)

The use of western coal is argued by the American Mining Congress for fuel requirements in the "crunch" period between 1975 and 1980 as they are the most easily strip mined and are the thick seams. (AMC,1974) This sounds like a logical arguement but there are alternatives such as the potential to immediately increase production in the east by expanding mine operations to work three shifts - this doesn't require opening new mines or the associated massive capital investments.

The West Virginia Legislature claims western mines cannot be opened more quickly or with less money than a new deep mine in the east. "The cost and time for ordering, manufacturing and constructing a giant dragline for a Western state can take three years or so and will cost around $20 million. Deep mines in West Virginia have developed in about that same time frame and for about the same expense." (State of West Virginia, 1974) The attractive part of strip mining for a coal company is the small labor force required. (Williams, 1974)

Another aspect to strip mining western coal is the potential to reclaim the land and the impact of mining the aquifers. There is a great deal of debate on this issue. The basic difference appears to be how different groups define reclamation. If it

RANGE OF HEAT, SULFUR AND MOISTURE CONTENT OF VARIOUS RANKS OF COAL

COAL RANKS, HEAT, SULFUR AND MOISTURE CONTENT

	HEAT CONTENT	SULFUR CONTENT	MOISTURE CONTENT
Anthracite	14,000 Btu/pound	0.7% or less	5%
Bituminous	13,100 Btu/pound	Over 4% to 0.7% or less	5%
Subbituminous	9,500 Btu/pound	2% to 0.7% or less	25%
Lignite	6,100 Btu/pound	1.5% to 0.7% or less	40%

COAL RESERVES BASED ON HEAT CONTENT

WESTERN COAL SEAMS

STATE	RANK OF COAL	STRIPPABLE RESERVES X 10^6 TONS	BTU VALUE PER POUND (average)	EQUIVALENT BTU VALUE OF STRIP RESERVES X 10^{12} BTU
Montana	Subbituminous	3,400	8446[1]	58,624
	Lignite	3,497	6934	43,761
Wyoming	Subbituminous	13,971	9014[2]	225,130
New Mexico	Subbituminous	2,474	9500[3]	46,048
North Dakota	Lignite	2,075	6561[4]	26,329
Total		25,417	8091	399,892

CENTRAL APPALACHIAN COAL SEAMS

STATE	RANK OF COAL	LOW SULFUR COAL 1% OR LESS	BTU VALUE PER POUND (average)	EQUIVALENT BTU VALUE OF LOW SULFUR COAL X 10^{12} BTU
West Virginia	Bituminous	47,471	11,500[5]	1,091,833
Virginia	Bituminous	8,058	11,500	185,334
E. Kentucky	Bituminous	22,132	11,500	509,036
Total		77,661[6]	11,500	1,786,203

Table: Environmental Policy Center. Sources: [1] Coal Age, Vol. 78, no. 5, page 121; [2] Bureau of Mines Information Circular 8538; [3] Coal Age, Vol. 78, no. 5, page 126; [4] Bureau of Mines Information Circular 8537; [5] USGS Bulletin 1275; [6] Bureau of Mines Information Circular 8312

means long term objectives and results showing a self-sustaining cover which has been returned to its previous agricultural use, then I have yet to see one. Under the current definition by coal companies there are enthusiastic presentations by mine operators describing their rehab success stories. And some of the companies have carried this a little too far. On a tour of a coal mine in Wyoming, a group was recently told that a plot of 40 acres had been covered with 15 to 20 feet of top soil and spoil material from the adjacent mine and planted with winter wheat. In March, this plot was green with productive growth. When two ranchers went down to examine the plot more carefully they found that it was in fact undisturbed soil which had been planted, and some overburden and soil had been used merely as fill for a dry creek bed. The green growth reflected the natural productivity of the land, but was not indicative at all of the potential for reclamation as it had been presented to the group.

Another time we were taken to a site north of Sheridan, Wyoming, and shown a very green and productive field along the Tongue River. It was represented as reclaimed land, but upon investigation it turned out to be the old location of several mine buildings. The buildings had been torn down and the area planted to grass and forage, but it had never been surface mined. The company was called on it then, but they still take visitors there and infer that they are demonstrating the potential for reclaiming western surface mined lands. This kind of deception does not help the image of coal companies in the west.

We know very little yet about the impacts on ground water, compaction and the time frames to return land to productive uses, outside of industrial plant sites, trailer parks and parking lots. The National Academy of Science study on the Rehabilitation Potential of Western Lands concluded that the variables in the west are so extensive that rehab potential would have to be site specific. (Box, 1973)

In North Dakota about the most that can be said on western reclamation is that attempts so far have been experimental and directed toward shortterm solutions of achieving some kind of ground cover. The objective of obtaining long term re-vegetation for agricultural uses is much further off and at present we may not even have knowledge of the alternatives available toward that goal. (Bond, 1971)

There seems to be a tendency by coal companies to think they are doing us a big favor by spending $100 to $500 a acre for reclamation. I'm not too impressed with their poverty attitude on this. (see chart, page 12)

Not the least of the worries here is the impact of mining on the aquifers and the potential to pollute surface and sub-surface waters with nitrates from the shales which overlie much of the western coal deposits. (WSF 4-1974)

On the legislative level the argument that reclamation and re-

ESTIMATED COSTS IN CENTS PER TON OF COAL FOR REGRADING STRIP-MINED LANDS TO A PLEASING, NATURAL CONTOUR

Assumed tonnage of coal recovered per acre	Estimated costs of reclamation per acre (dollars)				
	$500	$1,000	$1,500	$2,000	$2,500
3,000	.16	.33	.50	.67	.84
4,000	.12	.25	.37	.50	.62
5,000	.10	.20	.30	.40	.50
6,000	.08	.17	.25	.33	.42
7,000	.07	.14	.22	.28	.36
8,000	.06	.12	.19	.25	.31
9,000	.055	.11	.17	.22	.28
10,000	.05	.10	.15	.20	.25
125,000	.004	.008	.01	.016	.02

Tonnage of coal per acre, Gillette, Wyoming **	(dollars) Charge per ton - amount collected per acre for reclamation				
	.05	.10	.15	.20	.25
125,000	$6,300	$12,600	$18,900	$25,200	$31,500

**1M tons/sq.mi.=1,560 tons/acre. Gillette has 80.5M tons/sq.mi.(126,000 tons/acre)

Coal sold at the mine in western states - $1.80/ton

Coal sold at the mine in eastern states - $3.00/ton

These are simple arithemetic tables to show costs per ton of coal to equal a given reclamation cost level, and revenue derived in the Gillette area if different charges are assessed per ton of coal. Eastern coal deposits usually produce between 3,000 and 6,000 tons per acre and western deposits produce much larger amounts per acre. Economics and strict standards should not be a problem for Wyoming when our strippable coal seams are thicker, more accessable and profitable than in other states in the east which manage to survive with strict laws when they have less strippable coal and less profits.

NORTHERN PLAINS OFFICE, SIERRA CLUB, 1973

vegetation will be complex and site specific has been used by those who support weak strip mine legislation to water down legal requirements for post mining land use objectives and standards. Last year the mining industry was accepting the fact that they might have to stop stripping where it is impractical to reclaim. This year they supported substitute legislation which essentially said they were not required to reclaim where it was impractical.

From the topics of other speakers later on in your conference there may be a good case made for gasification in the west. So I feel an obligation to verbalize some other considerations to keep the options open. Assuming that gasification may be one source of future energy, there is a question on what coal should be used and additionally if we shouldn't put the research and investment dollars into in-situ processing over large surface developments.

Some arguments are again made that eastern high-sulfur coal should be used first. To convert low sulfur coal to a synthetic gas or liquid in the name of providing "clean fuels" is to defeat the ultimate purpose of coal conversion: removal of sulfur from the raw material to provide fuels which comply with air quality regulations when burned. (EPC, 1974)

The drawback here from the point of view of the oil companies is that in contrast to the west the ownership of coal in the east is spread among many land owners and companies. Negotiations by oil companies to obtain blocks of coal are more difficult, time consuming and costly for them. What gasification plants might cost us in the west has not been explored completely in terms of taxes, land use, water, increased population and social conflicts. These costs and benefits should be approached and weighed carefully by the state governments and not through promotional studies financed by the developing companies. They have a very natural and understandable bias to look at what will benefit their interests. Montana handles this problem by requiring the deposit of a certain percentage of plant construction costs for the state to do necessary studies...and there is no guarantee by the state that they will approve the plant construction after studies.

Both liquifaction and gasification processes are limited in their application to all ranks of coal. The western subbituminous and lignite coals are suitable for the "Lurgi" gasification method and the Bureau of Mines, "CO_2 Acceptor Method". The Hygas and Bi-Gas methods, being researched by the American Gas Association can use all types of coal as a raw material. (Haber, 1974)

In-situ gasification has support among geologists but naturally not with the surface mining industry. John Wold, a prominent Wyoming Geologist calls to our attention that only 3 per cent of U.S. coal can be surface mined and 97 per cent is in deep reserves. He claims that, "a tract of land 10 miles long and 5 miles wide in the Powder River Basin of Wyoming contains more coal Btu's at a depth of 1,000 to 2,000 feet than all the known oil reserves in the United States." In conclusion, Mr. Wold says, "Underground coal is without peer on the domestic fossil fuel resource ladder. Remote controlled mining and underground gasification will minimize surface pollution and have promise for producing clean fuels. In

particular, certain in-situ gasification and hydrogenation proposals offer exciting cost figures for production of commercial gas." (Wold, 1974)

These are just a few of the current issues, choices and arguments on coal.

AIR

A discussion of the air quality issue was once described as the case of smoke east versus smoke west. Inevitably to talk about air pollution leads to the problems associated with power plants and energy development in the western states. Large coal fired electric plants produce and distribute great quantities of particulates, sulfur, nitrogen oxides and trace elements such as lead, mercury, selenium and molybdemum.

The largest power plants in North Dakota now are in the 250 megawatt size. These are small plants compared to the ones under construction at Colstrip, Montana, and the Jim Bridger plant northeast of Rock Springs, Wyoming. There the size ranges between 1800 and 2000 megawatts. Under present air standards, we would need four plants the size of the Jim Bridger to equal the daily sulfur emissions of New York City form all sources. The North Central Power Study and other Bureau studies report a possibility of several plants near Gillette, Wyoming, to be in the 10,000 megawatt range...one such plant would equal the daily sulfur emissions of New York City and exceed their present particulate emissions from all sources.

The combined plans of four companies to construct power plants in west central North Dakota total 11,500 megawatts. (NDUF 2-21-74) Fargo is downwind, isn't it....

The National Air Standards were not set up to maintain air quality in clean regions -- they protect dirty areas by restricting any further degrading, but in essence they allow clean areas to deteriorate down to their levels before any restrictions become effective.

One of the big promotional points for western coal is its low-sulfur content for pollution control. While the sulfur content in western coal is low, so is the heat value so more will have to be burned for a given output. The federal standards for emission of sulfur dioxide from stationary sources is set at 1.2 pounds per million Btu of heat generated. Western coal, with a sulfur content of 0.7% may actually classify as medium or high sulfur coal when combusted. (EPC, 1974) Montana feels so strongly about the problems of power plants that they are taking the position that, "For at least...five years...Montana people and their government would assent to leasing of coal only if its combustion or conversion will take place near the nation's high energy demand areas." This position would be modified if industrialization is necessary to meet state needs. (State of Montana, April 1974)

In using western coal in the east there are other problems.

EMISSIONS - tons/day

	PARTICULATES	SO_2	NO_x
New York City (all sources)	150	1,077	
Los Angeles (all sources)	110	275	950
Four Corners (6 fossil fuel plants)	220	1,970	1,280
Proposed Plants in the North Central Power Study**			
thirteen 10,000 megawatt plants	2,800	16,900	9,810
five 5,000 megawatt plants	540	3,250	1,890
two 3,000 megawatt plants	129.5	780	452
five 1,000 megawatt plants	108	650	370
TOTALS	3,577.5	20,580	12,530
North Central Power Study** plants at the 53,000 megawatt level.	1,144	6,890	4,001

** Emmissions calculated from Standards of Performance for New Stationary Sources of the Environmental Protection Acency. Published in the Federal Register, August 17, 1971.

EMISSIONS BY MEGAWATT SIZE - tons/day

	PARTICULATES	SO_2	NO_x
10,000 megawatt	216	1,300	755
5,000 megawatt	108	650	378
3,000 megawatt	63.9	390	226
1,000 megawatt	21.6	130	75.5

Charts: Dr. Michael D. Williams
John Muir Institute
Albuquerque, New Mexico
1972

NOTE. Since this chart was made the EPA has changed the method for measuring particulates. All the numbers in the particulate columns would be reduced by half. This change does not reflect stricter standards or reduced emissions.

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While substituting the coal in existing plants -- companies will have to modify boilers and will suffer reduced combustion capacity. Precipitators designed for high efficiency dust removal from high sulfur stack gas will operate at reduced efficiency on low sulfur stack gas. According to a study by EPA, these problems, if they are accepted could increase the utility long run combustion costs by half. (EPA, 1973)

For new plants designed to burn low sulfur coal the problems are not so great. However, even with low sulfur coal it will be a border line case if they will meet the federal standards because new plants are not installing sulfur control equipment. If sulfur controls were installed in addition to burning low sulfur coal the results would be dramatic. (see table on page 17.)

Many of the current arguments on the availibility and feasibility of pollution control are more political in nature than based in any real lack of technology. We have noted a tendency by the companies to claim they are using the best available controls. Without becoming involved in a lengthy description of corporate and industry decision making I think it is fair to say that advancement in pollution control will be assisted more by good regulations than industry initiative. Engineers can design to numbers, they cannot design to a philosophy such as, "the best available technology." (Bartlit, 1973)

One point of contention which is always brought up will be the costs, whether it is air pollution control or something else. It almost seems as if some are suggesting that the quality of our human habitat is a luxury and expendable in the name of growth or national security or jobs or any number of vague generalities. It is not a matter solely of increasing the cost of a product, as though this were an extraneous intrusion, because the cost is there in one form or another, either assumed by business in the beginning operation and production, or downstream enlarged and widened by society.

WATER

The next area of discussion is water. The availability and management of water in the northern plains to support different levels of industrial development is a very sticky topic.

The divergence of opinion on water is very significant -- one group says there's lots of water and the other claims a scarcity. The water abundance theory is promoted by the Bureau of Reclamation. In connection with the North Central Power Study the Bureau claims availability of 1.7 million acre feet and 2.8 million acre feet for coal development in general. (BuRec, 1971) The Bureaus Western Dakota Basins Study and the North Dakota State Water Planners are both preparing plans for large scale diversion from Garrison Reservoir south to lignite fields. Industrial water requests associated with this diversion are in the neighborhood of 700,000 acre feet a year. (MPP 2-6-74)

On the water scarcity side the water chapters of the National

Emissions from the Jim Bridger Plant

	presently planned controls	moderate controls	good controls	Los Angeles regulations
	tons/day	tons/day	tons/day	tons/day
PARTICULATES	12.9	4.3	1.9	.36
SULFUR OXIDES	284.	28.4	5.7	6.
NITROGEN OXIDES	149.	112.	62.	7.

For particulates: moderate controls include baghouses such as are planned for Four Corners. good controls are 99.9% effective baghouses.
For sulfur oxides: moderate controls are 90% effective scrubbers. good controls are 98% effective scrubbers. Both have been used in power plants in England before World War II.
For oxides of nitrogen: moderate controls are alkali scrubbers like those at Lawrence, Kansas which remove 25 to 30%. good controls use lower excess air and alkali scrubbing. These controls have been used on gas and oil fired plants and small scale coal fired plants.

Implications of Emissions of SO_x and NO_x

control level	planned	moderate	good
3 hour average SOx	.26ppm	.026ppm	.005ppm
3 hour average NOx	.20ppm	.15ppm	.083ppm
3 hour average NO_2 *	.08ppm	.06ppm	.033ppm

Plant damage has been observed at concentrations of .05 to .25 ppm of SO_2 and NO_2 together.
* Limited measurements at Four Corners give peak NO_2 concentrations of approximately 40% of the peak NOx concentrations.

Plume Opacity

control level	light transmitted through plume at 25 miles (downwind)	light transmitted through plume at 50 miles (downwind)
planned	1.1%	0.38%
moderate	52%	50%
good	82%	84%

These plume opacities are for a person looking through the plume at plume level toward a distant object. Looking up or downwind into the plume will decrease the visibility to a greater extent. For the average observer at least 5% transmission is needed to see an object beyond the plume. Thus with present controls the plume would be opaque. With moderate controls the situation is much better while with good controls it is fairly good.

These calculations assume dispersion given by the HEW workbook by Bruce Turner with neutral stability and relatively high wind speeds ~ 6 meters per second (13.4 miles per hour). They also assume conversion of sulfur oxides to sulfates at the rate of 6% per hour (these rates are considered appropriate for conditions expected in the Mojave Desert during the daytime.) The particulate absorption and scattering is based on the size distribution released from a 99% precipitator with scattering and absorption assumed equal. Because of the uncertainty as to conversion rates, no conversion of NOx to nitrates was assumed.

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Academy of Science study on Rehabilitation Potential of Western Coal Lands, say, "The shortage of water is a major factor in planning for future development of coal reserves in the American West. Although we conclude that enough water is available for mining and rehabilitation at most sites, not enough water exists for large scale conversion of coal to other energy forms (e.g. gasification or steam electric power.) The potential environmental and social impacts of the use of this water for large scale energy conversion projects would exceed by far the anticipated impact of mining alone. We recommend that alternate locations be considered for energy conversion facilities and that adequate evaluations be made of the options (including rehabilitation) for the various local uses of the available water." (Box, 1973) The USGS authors of the Academy water chapters also say there is a problem of information on basic hydrologic conditions and quantitative data on surface water quality and mining impacts on the surface and sub-surface water.

The state of Montana was concerned enough on water availibility and uses to pass a three year moratorium on water use applications. They are not willing to accept further allocations without substantial evaluation. A key feature of the moratorium act is that, "future municipal water needs, flow requirements to maintain the productivity of aquatic life, and projected irrigation needs will all be measured, reserved and accorded preference over the industrial demands which may be submitted in the interim." (State of Montana, April 1974) I feel it is good that the state of Montana is looking out for future agricultural needs now that the Bureau of Reclamation has changed their priorities from agriculture to industry demands. (BG 5-27-73)

Agriculture in the Yellowstone River Basin of Wyoming and Montana is using 2,400,000 acre feet of water a year to irrigate 1,400,000 acres of land. There are an additional 2,300,000 acres suitable for irrigation in the Basin. (MRBC Framework Study, vol 1,6) According to some agricultural interests the industrial diversion of millions of acre feet of water would critically threaten the efficiencies of present pumping and diversion facilities and would eliminate any further development of irrigable lands.

It is difficult to assess just how much commitment energy companies have in the water resources -- they will buy up options at a rapid rate but it is said to be just an insurance type action. Interest expressed so far in terms of options, applications and requests in the Yellowstone River Basin is at the 2.7 to 3.3 million acre feet per year level.

The draft report of the NGPRP Water Work Group shows that for the most probable rate or level of development, "the depletions which can be expected to result from coal development are a relatively minor part of the overall projected depletions above the 1970 level of development." Though the draft is not too clear it appears that 7.5 million acre feet is the most current estimate for depletions and this includes coal development. By inference, I gather this estimate was based in figures which did not consider instream needs, that is, "the minimum amounts of water required in a stream (seasonally) to maintain essentially the existing aquatic resources

INDUSTRIAL WATER APPROPRIATIONS, REQUESTS AND OPTIONS IN THE YELLOWSTONE BASIN
in acre feet/year

RIVER	COMPANY	APPROPRIATION FILED	BU REC OPTIONS	BU REC REQUESTS	TOTAL (Rivers)
Powder	Utah Internat'l	80,375			
	Reynolds	36,000			
	Unknown(Moorhead)			220,000	
					336,375
Tongue	Montana Power	4,175			
	Norsworthy & Reger	223,000			
					225,175
Big Horn Yellowtail and Boysen Reservoirs	Exxon		50,000		
	Peabody Coal		80,000		
	Gulf Oil		75,000		
	Shell Oil		48,000		
	Westmoreland		30,000		
	Kerr-McGee		50,000		
	Reynolds		50,000		
	CIG		30,000		
	Amax (Ayshire)		30,000	90,000	
	Panhandle Eastern		30,000		
	Norsworthy Reger		50,000	10,000	
	Cardinal Petro.		50,000	92,000*	
	Sun Oil		35,000	35,000	
	Wold-Jenkins		50,000	50,000	
	Mobil Oil		50,000		
	Conoco (Consol)			530,000	
	Montana Power			50,000	
	Atlantic Richfield			50,000	
	Pacific Power & Light			30,000	
	Northern Natural Gas			20,000	
	(Unknown)			308,000	
					2,193,000
Yellowstone River	Tenneco (Intake)	80,650			
	Montana Power at Billings	289,600			
	Montana Power at Forsyth	181,000			
	Basin Electric	36,200			
	Hunt Oil	144,800**			
	Getty Oil	92,000			
					824,250
GRAND TOTAL YELLOWSTONE BASIN		1,167,800	708,000	1,485,000	3,360,800

*Intermountain Resources
**approx. 6,000 a.f. irrigation
table source, Northern Plains Resource Council

associated with wildlife and shoreline habitat." Depending on the flow rates imposed to maintain certain instream needs, "the amount of water available for storage or for new use is reduced in the magnitude of 30 to 60 percent for any one selected storage volume and location.."

In determining water availability the Water Work Group agreed that their figures would be based on certain instream needs. I'm not certain this was followed in some tables, but they do say, "Total new water availability in the Yellowstone Basin would be under 2 million acre-feet annually if the recommended instream flows are satisfied. If the recommended instream flows are disregarded but certain arbitrary minimum flows are maintained, about 3 million acre feet could be available annually. These amounts will require construction of new storage reservoirs. Without new storage, only 1 million acre-feet could be available annually in the Yellowstone Basin, and instream flow recommendations might not be fully satisfied." Below the Yellowstone Basin, the Missouri main-stem reservoirs are said capable of yielding at least 2 million acre feet for industrial use. The Western Dakota tributaries have little to contribute, maybe 30,000 to 50,000 acre feet. And the Green River, headwaters of the Colorado River might supply 100,000 to 300,000 acre feet a year.

Of the 16 million acre feet annually entering the head of Garrison Reservoir, about half stems from the Yellowstone River. If industries consume large quantities up stream the reservoir will suffer and so will North Dakota plans for water uses in the lignite fields. Large drawdown at the reservoir would adversely effect fisheries and recreation which were big selling points for Garrison dam in 1954. A twenty five foot drawdown would produce mudflats between 20 and 50 miles long. (BG 3-19-74)

To top off all the confusion is a little legal matter of who owns how much water and who can sell it. The states claim certain rights and the Bureau of Reclamation and the Corps of Engineers have a dispute on jurisdiction and the Indians may have the final word.

PEOPLE

A fourth area of discussion will be the people, the local rural economy and the new people associated with industrial and energy development. Projected employment increases associated with coal development vary. The NGPRP estimates run between 500,000 and 870,000 by the year 2000. The lower projection, the base scenario of NGPRP includes 6 power plants and 3 mines. The higher figure is supposed to represent the extensive development scenario with 42 gasification plants, 11 power plants and 48 mines. (NGPRP, Socio-Economic Work Group, Mineral Work Group)

Distributed over the five state area these increases might not seem too great; however, the major impact will be felt in the small communities where gasification or power plant sites are located. Each gasification plant will employ 800 to 1,500 people and power plants between 500 and 800. Including the supporting community a gasification plant would mean 8,000 to 12,000 people and a power

plant a little less. (BuRec, April 1972)

During the plant construction period the work force is greatly expanded. As an example, "Montana Power Companies project at Colstrip will draw up to 1,800 workers this summer, but the massive steam generating plants and new coal shovels will not be added to the tax rolls until after the construction is completed - after workers have left and the school crunch has ended." (BG 3-17-74) Long term employment may be less than half the construction crew numbers.

Impacts on existing communities and life styles should be carefully evaluated. New populations take up ranch and farm land for sub-divisions. The traditional rural interests of a community will shift to the needs of an urban society. New residents search for areas to recreate and the taxes may increase to support increased services.

Theoretically, new residents should pay their own way, but the lag in assessment and benefits given for industrial development usually mean that revenues don't keep up with the sudden demand for increased services. Sometimes they never do catch up. The burden in this situation rests more on the established residents than the new comer.

To avoid these problems, the states and their governors must play a leading role for advanced planning and funding before the population increases occur. The companies causing the population increases should pay for this planning but they should not do the studies. Too often in the past a company has spent money to broadcast to the local populace what a wonderful bag-of-goodies industrial development will bring instead of awaiting the nitty-gritty of state and community analysis.

One aspect of the population issue in energy development that has been given little consideration or respect is the social costs to one group in adjusting to new patterns whether it is the incoming workers or the local population. The popular study approach is to lump this whole issue under the title of socio-economic impacts, but this can result in a rather partial coverage. It is much easier to measure the flow of dollars and traditional cost-benefit studies, that is, the economic side.

The sociological side is much more illusive and does not lend itself to precise measurement or attention. In addition, I feel, there is a general unconscious feeling that the protection and valuing of life styles is a real dingy point-of-view...it promotes local values over development dollars. (That's like being against motherhood.) And perhaps this financial bias is heightened in a society where so much emphasis and decision making rests with a few financial concerns that reside outside our area.

I'm not talking about the desirability of everyone making a decent living and benefiting from our advanced technology but rather in the case of energy development the powerful influence of large energy industries over the rural economies. For anyone interested in this

concentration of power, I suggest a Senate document that came out last year titled, "Disclosure of Corporate Ownership"

One of the basic conflicts in the small rural communities now is in the value system and goals of the resident rural population and the incoming construction workers. On the one hand the ranchers associate themselves with long term commitments and roots with the land where change is slow and deliberate. The new comers on the other hand have adapted to life styles to accomodate uncertainty and rapid change. Not only are the ranchers thrown into a situation where they must interact with many people who have different standards but they must also try to deal with monied industries whose behavior is amoral and profit oriented on a rather large scale. Certainly the rural interests are also profit oriented but (outside national lobbies) it is on an individual or community basis. How does a rancher protect himself when approached by a whole battery of big business tactics -- high paid lawyers, public relations men, survey crews and so on? Single ranchers or even state farm and ranch organizations don't have the financial resources to compete legally with these energy companies. Nor is it fair to use the public image approach where assumed mass demands and a tradition of might-makes-right is applied as a guilt label to those who are in the way of energy development because they choose to live and produce on the land.

Maybe the burden here falls on the states. Your State Planner, Jack Neckels appears to be approaching concern for this conflict. Commenting on the states recently funded feasibility study on gasification and electric generation, he said, "We'll be looking carefully at how major lignite development with its heavy water usage, will affect the agrecultural and tourist industry. Little would be gained if existing jobs in agriculture or tourism were traded for new jobs in gasification plants." (MPP 3-6-74)

Montana is also assuming a role to support and defend their agricultural interests, at least in public statements.

There are other social changes which large companies and big money produce:

1. Local families and owners can become appendages of national and multinational conglomerates.
2. Rather than absentee-owned firms disregarding a community's welfare, a large local corporation may utterly dominate the town simply by flexing its economic and political muscles.
3. The impact of a corporation on a community can be reflected by such factors as civic welfare, political sway, industrial pollution, local taxes, corporate philanthropy, local investment and racial discrimination...and whether the source of the impact stems from absentee-run corporations or a local corporation, the damage to the community is often quite similar.
4. Acquisitions by absentee owners can also reduce the use of and potential additional use of local professional services...most of the acquired firms shift away from local accountants and lawyers toward the accounting and legal services of the parent firm.
5. In corporate philanthropy the infusion of private funds

leads to some community benefits...and equally clearly, there are benefits to the donors: gifts can reduce federal, state and local estate taxes, thereby limiting public revenue; the donor may retain control over the disbursement of funds; the firm reaps invaluable publicity over its community concern and corporate policies can be indirectly promoted.

6. A firm can take more out of a community through tax underpayment than it returns although publicity over its generosity convinces communities they are net beneficiaries.

7. And finally, a dominant local corporation will often deploy their political power to pollute without challenge. (Green, 1973)

I'm not listing these problems to elicit negative reactions to industrial development. Rather my point is that they need analysis now -- both economic and social -- prior to development if we are to advance over the mistakes and problems of other areas. It is so easy to talk of mechanical and technological progress while failing to progress beyond the socio-economic mistakes of previous generations.

LAND USE

Perhaps the worst can-of-worms will be the issues and conflicts in land use planning. By definition it falls to those who work in this field to draw together community objectives, assess land use values, discover development trends and then try to plan for all of them. It is almost an impossible job.

Anyone in this role can probably use all the help we can give... consider for example how primitive communication is between state agencies and between the states and the federal government. If we add onto that the indistinct goals and aspirations of the agricultural community and the secrecy of corporate industries we have made the land use planner something that might exist in theory and not in reality. But there are some real live planners with us this morning and I am glad they have the burden of confronting the specific planning and management issues in the roundtable discussion which follows.

In relation to energy development in our area there are several different philosophical approaches to planning -- what I call nibble planning, momentum planning and environmental planning. These different approaches influence basic assumptions and the direction of decision making processes.

The nibble theory in corporate and government planning runs something like this...the resource is coal, there's lots of it and we can control, influence and profit from its development. Energy companies begin with applications to lease coal, buying water options and surface ownership. Government agencies react to these activities by leasing the coal and water and initiating studies. Everyone here is more or less operating in his own sphere. A view of the total picture is not part of this planning pattern except as each special interest views its own goals. In the northern plains energy companies have managed to nibble off large chunks of our non-renewable resources.

Momentum planning differs from nibble planning in that it deals

with directions rather than individual actions, but both patterns compliment each other. After establishing goals the energy interests work on expanding the need for their products to keep the momentum moving and dependancy centered on existing technology and fuels. They call it stock holder or public demand. Government agencies have a long history of momentum planning by finding projects that keep agencies in business and by expanding funding commitments in established programs. A good example of this is the North Central Power Study -- a Bureau of Reclamation study undertaken with a special interest group for the stated purpose, "to promote the coordinated development of electric power supply in the North Central United States." This study became politically to hot and is now termed "dead." But its purpose was clear...it focussed attention to the exclusion of other interests on western resources and promoted the coal and utility industry as well as the Bureau of Reclamation.

Environmental planning is just beginning and there are few good examples yet probably because very often there has not been the chance to start at the base of an issue. So, caught in the middle of actions and in order to shift the planning process in a different direction the most common behavior for an environmental planner in the beginning resembles someone throwing sand in the machine. It goes something like this...slow down, wait a minute, things are out of balance here. Shouldn't we look at a total picture. There is a developed economy here which is valuable and productive and maybe we don't want to be the utility dump for the east or lose our rural values for urban blight. Let's look at the choices available.

In terms of decision making the first two planning methods look at a resource and start planning to minimize impacts on the other resources. They are subject to political pressure and tend to be single issue oriented. The last method looks at the existing situation and tries to measure how much coal development might be compatible while maintaining other resource uses. Planning decisions could be quite different depending on which end you start work...a whole different perspective and set of issues will be addressed.

Total environmental planning can be inserted at any level of development should the interested parties decide to change the direction we are being taken by nibble and momentum planning. It means slowing or even stopping in some cases the decision making process while adjusting the planning process. But all too often the attempts to shift the planning focus arouses unpleasant responses from the special interests.

For example, a fear of this shift was reflected by Carl Bagge, President of the National Coal Association when he testified in Washington on the future of coal leasing in the northern plains. He claimed that scare tactics were being used, "by those committed to stop coal development by any means without regard to current reality." He said, "Such an effort must be recognized for what it is and dealt with accordingly"...whatever that means. But maybe it doesn't matter for I am amused to find that in the very next sentence he does exactly what he accused the environmentalists of doing...he threatens a crisis. These were his words, "For if in our concern for the

environment we permit ourselves to forstall the type of coal growth that is needed to insure American energy self-sufficiency, we will in fact bring America again to the point of energy crisis. If this occurs, the rational utilization of the coal resource in tandem with the minimization of the environmental costs concerned with coal development will be ignored and the nation will inevitably face extreme economic, social and political consequences."

Aside from the crisis threat, Mr. Bagge, in this statement assumes his industry represents "rational utilization" of the resource and he exhibits support for momentum type planning as opposed to environmental planning by taking the view of minimizing impacts instead of respecting existing uses and working around them.

I think the Coal Association President underestimates or does not understand the intricacies involved in the changes coal industries could bring to us or perhaps he does not want to face the more unpleasant, as well as the pleasant aspects. He says. "Fortunately, the problems of growth are infinitely easier to solve and much more desirable than those connected with stagnation or decline. Given good will on the part of all concerned and the willingness to cooperate, the growth of the Northern Great Plains area can be a model for future industrialization throughout the United States." That sounds like a motherhood picture where everyone lives happily everafter in dreamy bliss. But it is deceiving. Good or bad will have no place here but instead there should be thorough analysis, evaluation and questioning of the whole picture.

The National Coal Association should not be the one to define what is rational development in the northern plains. These definitions should rest with the citizens of the area, their state governments and perhaps a regional plan. To claim that we don't know or can't predict what will happen is a cop-out for industry, for the states and the federal government. It may be considered naive by some, but our elected officials and agencies are supposed to be looking out for our interests and not just reacting to the most immediate pressure.

The states might consider adopting policies for the future which would incorporate the many existing land uses and agricultural production. Coal development would have to fit into that plan as a working partner. The danger of adopting state energy policies without or before the policies for other interests means that energy will dominate the decisions and the other uses will have a continuous disadvantage of ongoing adaptation. If the state feels they don't have the background or resources at this time to make this overall planning program, they can follow Montana's lead in supporting coal export, opposing new coal leases and new power and gasification plants until they have an acceptable plan.

The Governor of Wyoming is using a different approach and in my opinion it is one which will not give a meaningful role to the citizens of the state. Governor Hathaway has set up a task force comprised of the heads of the state agencies for the Powder River Basin. The task force will have a 53 member advisory council.

In the Governor's words, "the Task Force is not another study group. It should serve as a catalyst for developing an action plan for the Powder River Basin." (GNR 4-4-74)

This vague assignment has made implicit decisions for Wyoming citizens. First, it assumes that the state has the knowledge on impacts and has evaluated them to the point where agency reactions will be adequate. This is a different position from Montana which felt that they did not have sufficient evaluation of the conflicts involved in the mine mouth utilization of coal to permit new development.

Second, Wyoming has in essence decided on a reacting role to energy development instead of a state plan which protects existing uses while incorporating compatible coal uses.

Third, it means the citizens will be in an adjusting role instead of a managing role, a decided advantage to industry.

Finally, the size of the advisory group is almost humerous. It will cost the local citizen members their time and money while industry participation is something they are paid to do by the companies. Meetings of the advisory group will be unmanagable because of its size. And their obscure role "as catalyst for developing an action plan" is vague and unrealistic without long range industrial plan disclosures and the lack of state policy. Wyoming state environmental laws are still regulatory and not planning in nature.

NATIONAL ACTIVITY

In the midst of all these discussions on energy and coal needs in the northern plains, we have activity on the national level which could sweep aside state controls on coal development. One is called Project Independence with a goal of self-sufficiency by 1980. The National Coal Association supports this plan naturally because the main goal of the project would be to quickly commit us as a nation to use coal especially through rapid development of synthetic fuel plants. Secretary of Commerce Frederick B. Dent is circulating a plan to subsidize new synthetic-fuel industries at a cost of $98 billion over 14 years with 68 plants to produce synthetic oil and gas by 1982. Secretary Dent certainly has talent in "thinking big." But he modestly acknowledges that the manpower and material problems to do this would need severe marshalling of resources. (WSJ 3-7-74)

Outside the many hearings in Washington D.C. on energy futures there hasn't been much chance for the general public to express their preferences on energy development. If you belong to a group with sufficient funds to research and present testimony you may have been heard. But we might look at who has the money to promote certain goals? Is there a special interest with funding to promote solar energy? Do the farm and ranch organizations feel sufficiently concerned to question coal development in addition to their regular legislative job of promoting rural interests? Some like the Farmers Union are. The Bureau of Reclamation has quietly shifted its priorities from agriculture to industrial water supplies. Is this

just to preserve the agency or part of the whole momentum planning toward coal development in the west?

Another potential for sweeping aside state interests is a bill that would require each state to designate a certain number of plant sites for energy facilities adequate to meet regional and national needs. What is an adequate supply?

Again a few narrow interests are attempting to place a coal development priority over the other local economies. For private corporations to use tax breaks and unrestricted profits (collected, as usual, by increased costs to the consumers) to develop public resources they expect to control and exploit for profit is just a little too much. I don't think the popular choices being talked about in Project Independence and related proposals represent much more than a reaction to the organized pressures of those interests who have the money to promote their version of the future and promote in the process their profits through supporting studies and public relations campaigns. Other choices are available that would probably cost about the same in terms of dollars given the interest and commitment toward development but they would not degrade the human environment and quality of life.

CONCLUSION

The future of energy development in the western states is interrelated with national policies and the financial interests of nultinational corporations. Coal is only one of many energy fuels and while it appears to be the most abundant of the fossil fuels, its extraction and use is damaging and expensive to the renewable energy cycles on which life depends. Contrary to the accusation that environmentalists want us to go back to a cave-man life style, it is the rapid depletion of our non-renewable resources that will commit us toward that end.

"We are still expanding our rate of consumption of gross energy, but since we are feeding a higher and higher percentage back into the energy seeking process, we are decreasing our percentage of net energy production." (Odum, 1973) Economic inflation works on a similar pattern because we are paying more and more while getting less real output per units of money circulated.

Calculations of our fossil fuel reserves are traditionally based on the gross reserves to imply that growth can continue. It might be more accurate to make the growth estimates in terms of net reserves. "Suppose for every 10 units of some quality of oil shale proposed as an energy source there were required 9 units of energy to mine, process, concentrate, transport, and meet environmental requirements. Such a reserve would deliver 1/10 as much net energy and last 1/10 as long as was calculated." (Odum, 1973)

Biologically there are natural systems which can be observed in both a growth state and a steady state. But our present day industrialists and economists have been trained during the period of rapid growth and their jobs, professions, and research models are built around this limited perception. So many economic studies today are superfluous because they do not incorporate the whole energy system and in addition they stretch the dollar like a rubber band or inflate it like a balloon.

Howard T. Odum, a leading biologist, has put it quite clearly, "The pattern of urban concentration and the policies of economic growth simulation that were necessary and successful in energy growth competition periods are soon to shift. There will be a premium against the use of pump priming characteristics since there will be no more umpumped energy to prime. What did work before will no longer work and the opposite becomes the pattern that is economically successful. All this makes sense and is commonplace to those who study various kinds of ecosystems, but the economic advisors will be sorely pressed and lose some confidence until they learn about the steady state and its criteria for economic success. Countries with great costly investments in concentrated economic activity, excessive transportation customs, and subsidies to industrial expansion will have severe stresses." (Odum, 1973)

The northern plains is under growth stress now -- will we go steady state or exponential growth state?

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