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# VALLE GRANDE-BANDELIER NATIONAL PARK

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HEARING  
BEFORE THE  
SUBCOMMITTEE ON PUBLIC LANDS  
OF THE  
COMMITTEE ON  
INTERIOR AND INSULAR AFFAIRS  
UNITED STATES SENATE

EIGHTY-EIGHTH CONGRESS

SECOND SESSION

ON

**S. 1870**

A BILL TO PROVIDE FOR THE ESTABLISHMENT OF THE  
VALLE GRANDE-BANDELIER NATIONAL PARK IN THE  
STATE OF NEW MEXICO, AND FOR OTHER PURPOSES

MAY 29, 1964

Printed for the use of the  
Committee on Interior and Insular Affairs



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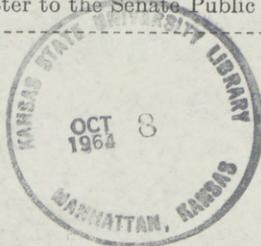
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## VALLE GRANDE-BANDELIER NATIONAL PARK

FRIDAY, MAY 29, 1964

U.S. SENATE,  
SUBCOMMITTEE ON PUBLIC LANDS OF THE  
COMMITTEE ON INTERIOR AND INSULAR AFFAIRS,  
*Washington, D.C.*

The subcommittee met, pursuant to notice, at 10 a.m. in room 3110, New Senate Office Building, Senator Alan Bible presiding.

Present: Senators Bible, Anderson, Hayden, Jordan of Idaho, and Simpson.

Also present: Jerry T. Verkler, staff director; Stewart French, chief counsel; and Roy M. Whitacre, professional staff member.

Senator BIBLE. The subcommittee will come to order.

The Public Lands Subcommittee hearings this morning are called with the full knowledge that this a holiday and that many of the committee members had commitments that would not permit their attendance at this time. However, the four bills we hope to take testimony on this morning are apparently noncontroversial, and I therefore trust that we will be able to complete the record on each during the day.

I know that the holding of this hearing today may well be an imposition on those in attendance since it has been designated as a holiday. Because of the floor situation and the additional announcement starting as of Tuesday we will go in session at 9 o'clock in the morning, I think it is very apparent that we must take every opportunity to clear up our hearings on pending measures.

It is for that reason that I have scheduled hearings at this time.

The bill for consideration, S. 1870, was introduced by Senator Anderson for himself and Senator Mechem, the two Senators from the State of New Mexico. This legislation provides for the establishment of the Valle Grande-Bandelier National Park in the State of New Mexico, and for other purposes.

We will make part of the record at this point the bill, S. 1870, introduced by Senator Anderson, for himself and Mr. Mechem, on July 15, 1963, the bill entitled, "To provide for the establishment of the Valle Grande-Bandelier National Park in the State of New Mexico, and for other purposes."

Mr. Reporter, also include as a part of your record at this point the official report of the Department of Interior recommending enactment of the bill and suggesting a clarifying amendment, dated March 25, 1964.

Also include as a part of the record a report of the Bureau of Budget, dated May 19, 1964.

Also include as a part of the hearing record a letter dated March 20, 1964, from the Department of Agriculture.

Also include as a part of the record a letter from the Atomic Energy Commission, dated March 20, 1964.

(The bill and documents referred to follow :)

[S. 1870, 88th Cong., 1st sess.]

A BILL To provide for the establishment of the Valle Grande-Bandelier National Park in the State of New Mexico, and for other purposes

*Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Secretary of the Interior may, subject to such outstanding rights and easements as he determines are not objectionable, acquire by purchase, gift, or otherwise the following land and improvements thereon, situated in the State of New Mexico, being portions of the Baca location numbered 1.*

NEW MEXICO PRINCIPAL MERIDIAN

Beginning at a monument on the southeast corner of Baca location numbered 1, being also a point on the Sandoval-Los Alamos County line ;

thence northerly along the said county line, being also the east line of Baca location numbered 1, a distance of approximately 5½ miles to a point, said point being approximately 1½ miles north of Pajarito Mountain peak ;

thence generally northwesterly on a ridge summit a distance of 1¼ miles to a point ;

thence generally southwestery up ridge lines to the crest of Cerro Del Medio ;

thence westerly across Valle Jaramillo at approximately the location of bench mark 8646 and southwestery upward along the ridge crest to Redondo Peak ;

thence southwestery along the ridges and spurs a distance of approximately 1.6 miles to the 9,000-foot elevation ;

thence southwestery a distance of approximately 1.75 miles to the north quarter section corner of section 1, township 18 north, range 3 east, said point being on the boundary of the Santa Fe National Forest and on the south boundary of Baca location numbered 1 ;

thence easterly along the south boundary of Baca location numbered 1 a distance of approximately 8.9 miles to the Sandoval-Los Alamos County line, said point being at or near M.P. 1 :

thence easterly along said county line, being also the northwesterly boundary of the Bandelier National Monument, to the point of beginning containing 30,745 acres, more or less, of Baca location numbered 1.

SEC. 2. When title to land described in section 1 is acquired, said land, together with the Bandelier National Monument, shall thereupon become the Valle Grande-Bandelier National Park and shall be administered by the Secretary of the Interior for the benefit and enjoyment of the people in accordance with the Act of August 25, 1916 (39 Stat. 535; 16 U.S.C. 1, et seq.), as amended and supplemented. The Secretary of the Interior shall cause to be published in the Federal Register a map of Valle Grande-Bandelier National Park as established by this Act.

SEC. 3. There are hereby authorized to be appropriated such sums as are necessary to carry out the purposes of this Act, but the sums appropriated for the acquisition of a portion of Baca location numbered 1, and improvements thereon, shall not exceed their appraised value as determined by the Secretary of the Interior through contact appraisals or otherwise.

DEPARTMENT OF THE INTERIOR,  
OFFICE OF THE SECRETARY,  
Washington, D.C., March 25, 1964.

HON. HENRY M. JACKSON,  
*Chairman, Committee on Interior and Insular Affairs,*  
*U.S. Senate, Washington, D.C.*

DEAR SENATOR JACKSON: Your committee has requested a report on S. 1870, a bill to provide for the establishment of the Valle Grande-Bandelier National Park in the State of New Mexico, and for other purposes.

We recommend enactment of the bill and suggest a clarifying amendment.

S. 1870 would authorize the Secretary of the Interior to acquire a tract of approximately 30,745 acres of land in New Mexico that constitutes a portion of the area known as Baca Location No. 1. Upon its acquisition, this tract and the existing Bandelier National Monument would become the Valle Grande-Bandelier National Park. This park would encompass an area of about 60,400 acres of land.

Enactment of this bill would make possible the preservation and interpretation of an area that is unique because of (1) its geology as part of a vast collapsed volcano; (2) its effect on the surrounding geography; and (3) use of this land by prehistoric people.

The dominating feature of the western skyline, as seen from the Bandelier National Monument, is the uplift of the Jemez Mountains. These mountains are the remnants of a great volcano which erupted in the past million years. As seen from a distance, there is little to suggest a volcano in the profile; only by traveling some 15 miles west of Bandelier National Monument into the central valley of the range can the nature of the eruption be visualized. Here is a basin of grassland ringed with forested hills on a scale so large that its extent is difficult to appreciate. This is the Valle Grande, a great valley in one of the largest calderas in the world. Although the Valle Grande now has the superficial characteristics of a volcanic crater, there was no single crater here in the days of the eruption. There was, rather, a vast dome of a mountain which poured from its flanks such a quantity of lava and other materials that its roof finally fell in. The ring of hills around the oval basin are the remnants of the ancient volcano's perimeter which remained elevated after the central area had collapsed. A portion of the collapsed summit of this extinct volcano is included within that part of the Baca Location No. 1 which would be acquired for the Valle Grande-Bandelier National Park. The volcanic activity that was so important in the formation of the Valle Grande also played the chief role in fashioning the Pajarito Plateau, a portion of which will be included in the park. It provided an uplift of land at the caldera and a downslope on which the lavas of the eruption avalanched in fire and smoke. Interspersed between the flows of heavy lavas were other avalanches and showerings of volcanic ash in great depth. When cooled and welded together in a layer of strata, they are called volcanic tuff. In the less than a million years since the volcano subsided, sheer walled canyons 500 feet deep have been cut through these deposits by streams and arroyos. As erosion continued, and portions of the cliffs fell, and as the soil washed from the mesa tops, talus slopes were built up and steep declivities were formed at the base of the cliffs.

This was a favorite building site for the prehistoric people who settled in the area, a portion of which is now preserved as Bandelier National Monument. The mesa tops and valleys were covered with pines and thick growths of juniper, pinion, and oak. Wild plants afforded sources of food, basket materials, and primitive medicines. The soil was suitable for raising corn and game was abundant. Water was available in permanent streams. The soft tuff of the cliff walls was dotted with erosion cavities which were readily enlarged with tools of hard stone, and the fallen blocks of tuff along the talus slopes were easily shaped into building stones. It was here that the talus dwellers of New Mexico hollowed out their homes in the soft tuff and built terraced houses in front of the caves for

great distances along the bases of the cliffs hundreds of years before the first Spanish expedition to the New World. The ruins of many of these cliff dwellings are already preserved in Bandelier National Monument and would become a part of the newly proposed national park.

As proposed in S. 1870, this national park will display a segment of the Jemez Mountains, from caldera to base, where the great volcanic story can be told and where the visitor today can get a fascinating glimpse of prehistoric man's adaptation to this environment.

Section 3 of the bill would authorize the appropriation of funds for acquisition of a portion of Baca Location No. 1, but provides that the funds appropriated shall not exceed the appraised value thereof as determined by the Secretary of the Interior through contract appraisal or otherwise. This section, as presently written, could be construed to require the Secretary to determine the appraised value of the land or interests in land, and improvements to be acquired before Congress could appropriate any amount for such acquisition. Also, if the Secretary should invoke condemnation proceedings to acquire portions of Baca Location No. 1, the court's determination of the appraised value could be at a figure higher than that determined by the Secretary. Accordingly, we recommend that section 3 be amended to read as follows:

"Sec. 3. There are hereby authorized to be appropriated such sums as are necessary to carry out the purposes of this Act, but the sums appropriated may not be used for the acquisition of portions of Baca location numbered 1, and improvements thereon, at a cost in excess of their appraised value as determined by the Secretary of the Interior through contract appraisals or otherwise, or as determined by condemnation proceedings."

On the basis of the preliminary cost data available, it appears that acquisition of the portion of the Baca Location No. 1 proposed for inclusion in the park will involve an expenditure of about \$950,000.

Proposed development of the park would consist of construction of about 13 miles of roads and 10 miles of trails, construction of a visitor center and four main shelters, as well as installation of interpretive exhibits, picnic areas, and other visitor-use facilities. It is estimated that approximately \$1,368,500 will be necessary for proper development of that portion of Baca Location No. 1 proposed for inclusion in the park. Annual recurring costs for maintenance and administration of the proposed park, relative to this development, are estimated at \$60,000.

The man-years and cost data statement required by the act of July 25, 1956 (70 Stat. 652; 5 U.S.C. 642a), is enclosed.

The Bureau of the Budget has advised that there is no objection to the presentation of this report from the standpoint of the administration's program.

Sincerely yours,

STEWART L. UDALL,  
*Secretary of the Interior.*

*Subject matter: To establish Valle Grande-Bandelier National Park, N. Mex.*

	19CY	19CY+1	19CY+2	19CY+3	19CY+4
Estimated additional man-years of civilian employment:					
Executive direction: None.					
Substantive:					
Supervisory park ranger		1.0	1.0	1.0	1.0
Supervisory park naturalist			1.0	1.0	1.0
Maintenanceman			1.0	1.0	1.0
Park ranger (seasonal)	1.0	1.0	1.0	1.0	1.0
Park naturalist (seasonal)	1.0	1.0	1.0	1.0	1.0
Maintenanceman (seasonal)			.5	.5	.5
Operator general (seasonal)			.5	.5	.5
Caretaker (seasonal)			.5	.5	.5
Laborer (seasonal)	1.0	1.0	1.0	1.0	1.0
Total, substantive	3.0	4.0	7.5	7.5	7.5
Total, estimated additional man-years of civilian employment	3.0	4.0	7.5	7.5	7.5
Estimated additional expenditures:					
Personal services	\$12,240	\$18,675	\$38,560	\$38,890	\$39,220
All other	803,260	510,325	623,440	243,110	18,780
Total, estimated additional expenditures	815,500	529,000	662,000	282,000	58,000
Estimated obligations:					
Land and property acquisition	950,000				
Development	244,500	655,000	435,500	33,500	
Operations (management, protection, and maintenance)	21,000	29,000	62,000	58,000	58,000
Total, estimated obligations	1,215,500	684,000	497,500	91,500	58,000

EXECUTIVE OFFICE OF THE PRESIDENT,  
BUREAU OF THE BUDGET,  
Washington, D.C., March 19, 1964.

HON. HENRY M. JACKSON,  
Chairman, Committee on Interior and Insular Affairs, U.S. Senate  
New Senate Office Building, Washington, D.C.

DEAR MR. CHAIRMAN: This is in reply to your request for the views of the Bureau of the Budget on S. 1870, a bill to provide for the establishment of the Valle Grande-Bandelier National Park in the State of New Mexico, and for other purposes.

The report which the Secretary of the Interior is submitting describes in some detail the scenic and scientific values of this area and recommends enactment of the bill with a clarifying amendment. In addition, the Atomic Energy Commission expresses no objection to the passage of S. 1870 if amended as set forth in its report.

The Bureau of the Budget would have no objection to the enactment of S. 1870 if amended as suggested by the Secretary of the Interior and the Atomic Energy Commission.

Sincerely yours,

PHILLIP S. HUGHES,  
Assistant Director for Legislative Reference.

DEPARTMENT OF AGRICULTURE,  
Washington, D.C., March 20, 1964.

HON. HENRY M. JACKSON,  
*Chairman, Committee on Interior and Insular Affairs, U.S. Senate*

DEAR MR. CHAIRMAN: In accordance with your request of July 19, 1963, we submit our report on S. 1870, a bill to provide for the establishment of the Valle Grande-Bandelier National Park in the State of New Mexico, and for other purposes.

This Department has no objection to the enactment of S. 1870 but from the relationship to the national forest would prefer a bill along the lines of S. 47.

S. 1810 would authorize the Secretary of the Interior to acquire, subject to such outstanding rights and easements as he determines are not objectionable, 30,745 acres of the Baca location numbered 1. The acres so acquired would be combined with the present Bandelier National Monument and become the Valle Grande-Bandelier National Park to be administered by the Secretary of the Interior. S. 1870 then would not directly affect this Department.

Baca location numbered 1 is an area of some 99,000 acres in northern New Mexico adjoined on three sides by the Santa Fe National Forest. S. 1870 is a modified version of earlier bills, S. 47 (88th Cong.) and S. 3321 (87th Cong.). Under the earlier bills the entire Baca location would have been authorized to be acquired and the little over two-thirds that would not have been made a part of the national park would have been made a part of the national forest.

We reported to your committee in S. 3321 on August 16, 1962. That report explained the reasons we believed the enactment of that bill would have been desirable.

The Bureau of the Budget advises that there is no objection to the presentation of this report from the standpoint of the administration's program.

Sincerely yours,

ORVILLE L. FREEMAN.

ATOMIC ENERGY COMMISSION,  
Washington, D.C., March 20, 1964.

HON. HENRY M. JACKSON,  
*Chairman, Committee on Interior and Insular Affairs,*  
*U.S. Senate.*

DEAR SENATOR JACKSON: By letter dated July 19, 1963, you requested our comments on S. 1870, a bill submitted by Senator Anderson to provide for the establishment of the Valle Grande-Bandelier National Park in the State of New Mexico, and for other purposes.

The bill, which we understand is intended to supersede S. 47, provides, among other things: (1) The Secretary of the Interior is authorized to acquire portions of the real property and improvements thereon known as "Baca location numbered 1," situated in the State of New Mexico. (2) When title to the above-described real property has been acquired by the United States, said land, together with the Bandelier National Monument, would thereupon become the Valle Grande-Bandelier National Park. (3) The park would be administered by the Secretary of the Interior as part of the national park system.

Two tracts of land lying in Los Alamos County and formerly under the administrative control of the Atomic Energy Commission would be incorporated in the Valle Grande-Bandelier National Park by virtue of this proposed legislation. One, a parcel containing approximately 2,882 acres of land and known as the upper Frijoles Canyon tract, was transferred by the AEC to the National Park Service of the Department of the Interior. On May 27, 1963, the President signed Proclamation 3539 (28 F.R. 5407, June 1, 1963) which added the upper Frijoles Canyon tract to the Bandelier National Monument.

Another tract, comprised of certain lands in the southwestern part of Los Alamos County, was transferred by the Commission to the National Park Service on December 9, 1959. Subsequently, these lands were added to the Bandelier National Monument by Presidential Proclamation 3388, June 9, 1961 (26 F.R. 247, Jan. 13, 1963).

Both tracts of land referred to above are so located that certain activities which might be conducted thereon could possibly interfere with the program and operations of the Commission in its adjoining lands. Accordingly, when these lands were added to the Bandelier National Monument by Presidential proclamation, certain limitations on their use were imposed. We recommend the inclusion of

a similar restriction in S. 1870 to apply to all Valle Grande-Bandelier National Park lands lying in Los Alamos County.

This recommendation may be accomplished by adding the following language as a new section 3 and redesignating the present section 3 as section 4:

"Sec. 3. The lands hereby added to the Valle Grande Bandelier National Park which lie in Los Alamos County, New Mexico, shall be subject to the restriction that the activities conducted thereon shall be confined to those which, in the opinion of the Atomic Energy Commission, will not interfere with the program or operations of the Commission on its adjoining lands."

Subject to the above comments, we have no objection to passage of S. 1870.

The Bureau of the Budget has advised that there is no objection to the presentation of this report from the standpoint of the administration's program.

Sincerely yours,

A. R. LUEDECKE, *General Manager.*

Senator BIBLE. The first witness on this bill is the author, Senator Anderson.

#### STATEMENT OF HON. CLINTON P. ANDERSON, A U.S. SENATOR FROM THE STATE OF NEW MEXICO

Senator ANDERSON. Mr. Chairman, this bill arose out of the desire originally on the part of the owners of the Baca location to dispose of it. The owners of the Baca location came to me and said that this was not a good piece of ground from their standpoint because it was from 8,000 to 11,000 feet in elevation and it is a summer range but not a winter range and they had no place to move cattle during the winter season. Therefore when Franklin Bond died this might be a good time to terminate the ownership of the Baca location by the Bond family. It was suggested that a national park might be established there since it did have 99,000 acres of very interesting land.

At that time I had a discussion with the family as to what might be a fair sales price for it. The suggestion was made that it might be purchased for \$1 million. We got into later discussions as the bill progressed and the price rose to a million and a half dollars and finally to \$2 million and then the Forest Service and the Taylor grazing people made a study of it and came up with a combined figure of about \$2½ million, and we were trying to proceed with some sort of a discussion when it became quite evident that there was opposition to the bill and we therefore decided we would send it down.

The original bill included 99,289.37 acres of land. Once that piece of ground was acquired, it is the larger piece of ground, the full square on the map—not just the small green bordered piece but the full square—once that is to be acquired, Baca Location No. 1 so-called, about 35,745 acres of that was to be transferred to the Park Service and some more acreage picked up from the Atomic Energy Commission. This Baca location is surrounded on three sides by national forest and on the fourth side by land of the Atomic Energy Commission, and it has not been very actively worked from a timber standpoint.

Actually the New Mexico Timber Corp. had written me when the first proposals were made, and said it was not possible to acquire it except by condemnation of their timber rights; that the original tract had been owned by the Redondo Development Co. The original sale was the land and one-half of the minerals to George Bond, the uncle of Frankling Bond, and the Redondo Development Corp. retained the timber rights for a period of 99 years.

That was somewhere around 1920. Therefore the timber rights were to be owned by the Redondo Development Corp. until some 2016, as I remember it, or something in that neighborhood. The Redondo Development Co. was then merged with one of the New Mexico timber companies and the Warren Trust & Savings Bank of Warren, Pa., is the mortgage holder and stockholder.

They retained 50 percent of the mineral rights from the shareholders of the Redondo Development and then subsequently, in about 1959, the New Mexico Timber Corp. negotiated the sale of its rights to the Western Planning Corp. and they purchased the plants and equipment of Western Timber Corp. When we discussed what would be a fair price for the timber, the then owner of the timber said he thought that \$9 million would be a fair price.

This seemed like quite a price to me because a short time before supposedly it had been offered for \$500,000. I thought a jump from this low figure to \$9 million in a period of a couple of years was quite a jump. We therefore desired to have appraisals made at that time, but the Forest Service and the Department of Interior made their investigation.

The original purpose was to take the land with the heavy green border, if you will point to that, and give that to the Department of Interior for the park, and transfer the rest of the property to the Forest Service, since as I said, the Forest Service owned all the land around it and they were in a position they thought to administer it successfully, since if a person wanted to cut the timber on the Baca location he would have to be able to get timber from some of the adjoining forest lands and the Forest Service thought they would be able to make a satisfactory deal.

We then discussed what might happen to it, and many interesting things did happen. The board of county commissioners of the county objected to the bill on the grounds of removal of large amounts of taxable value from their county. I then requested the county commissioners to tell me how much tax Baca location No. 1—not just a piece of it but all of it—was paying to the county, and I would be happy to have the committee obtain from the county commissioners that amount or the owner would appear to testify as to how much the taxes now are.

The American National Cattlemen's Association has sent a letter which I will be glad to have put in the record saying they are opposed to the bill because 30,000 acres is currently part of the most valuable land comprising a working cattle range.

I believe that the King Bros. of Stanley, N. Mex., are the operators of that ranch and they have used it to some degree, but the owners of it are the Bond interests of New Mexico, which are a very substantial interest. They have not run very many animals on it, and I think that Gordon Bond, the brother of Frankling Bond, could have testified at that time to their experiences with livestock on that particular piece of property.

It was not encouraging. Therefore, I was not able to understand why the American National Cattlemen's Association was so worried about it. But the best part of the grant from a timber standpoint is the part of it being returned to the Forest Service.

The part being reserved for a park was suggested for one reason and one only, the reason being that it was the largest volcanic crater

probably in the country if not in the world. Subsequently that statement was challenged and I received a letter which confirmed that this was the largest caldera in North America but there were other locations in the world that were as large or larger. Since this meeting was scheduled, I have received from George W. Savage, who lists himself as trustee and who is a real estate man in Albuquerque, a wire saying:

Reference to scheduled hearings on Senate bill 1870 and report on bill to Senator Jackson on March 25, Secretary Udall mentions on basis of preliminary cost data available acquisition cost of land to be about \$950,000. Entire Baca location No. 1 is subject to blanket mortgage and as the mortgagee we respectfully suggest this preliminary cost figure as being unrealistic and too low and even if this entire amount were to be applied on the note we would not feel justified in issuing a partial release on the land in question from the mortgage lien. While the proposed legislation provides for the acquisition costs to be determined by and cannot be in excess of the appraised value as determined by the Secretary through contract appraisals or as determined by condemnation proceedings, in your consideration of this legislation we thought you should be advised as to our thinking so that our rights would not be jeopardized.

Mr. Savage was for many years and I believe still is the representative of the Bond interest which sold the tract of land, supposedly at a price somewhat in excess of \$2 million, and if they are not willing to accept \$950,000 and release that portion of land upon the payment of that much money because they are worried about the security on the balance of it, I don't know how large their mortgage is but it must be a very substantial mortgage.

In other words, a very small amount must have been paid to them, and they must not have as much faith in the timber section as those individuals who thought it might be worth \$9 million.

The Interior Department, as I said, believes that \$950,000 appraisal would stand up on that portion of the land, and I think so, too. I am not trying to say that would acquire the timber rights. There is no desire on my part and insofar as I know on the part of anyone connected with the Forest Service to acquire timber rights on the entire structure. There are very few timber rights on the part that is marked with green on the map because that is the crater

That is the caldera, and I have flown over it, driven over it, ridden over it, or most of it, and I would be greatly surprised if the timber was that important in that particular section.

One interesting factor has also been brought into it. The Plains Electric Generation & Transmission Cooperative, which was started some years ago to tie together REA cooperatives in New Mexico, has sent a wire saying:

We understand you are hearing Senate bill 1870 to set aside 30,745 acres of the Baca location to create the Valle Grand International Park. We would draw attention to the fact that this would destroy thermal development presently underway estimated to be in excess of the California development, thus depriving the State and Federal Governments of badly needed revenues.

Well, there has been the Minnesota Dam for some long time. There has been some hot water and a few hot water baths which have without exception failed, and if there is some geothermal property there, that can be testified to. It certainly has not been developed, even though it has been attempted two or three times. Attempts have been made also to drill for oil in that area, and possibly the committee can obtain from the owners or former owners a statement as to what happened in those particular instances.

I have felt it would be worthwhile to preserve this largest crater on the North American Continent and one of the most interesting ones in the world.

I was glad to have Senator Mechem join me in the bill. We did not feel that this was destructive to the interests of Sandoval County because of the development of a new national park which would take in the area heavily bordered in green plus the little area next to it which is owned by the Atomic Energy Commission plus the Bandelier National Monument where the cliff dwellers formerly lived. That would make it attractive to the tourists.

The little area next to that heavily bordered green area is from the Atomic Energy Commission. When the Atomic Energy Commission went to Los Alamos it was then the site of the business school and the county commissioners, of course, were worried as to the acquisition of some more land because it would take that much off the tax rolls.

The development of Los Alamos with its 13,000, may be 15,000 people, its large plants and industries has been a very satisfactory development for our State, so much so that it was trimmed off of Sandoval County and made a separate county in itself. The Government is now in the process of disposing of it as a Government-owned institution and making it a community like the communities of Oak Ridge and the one in the State of Washington where Hanford is located. As I say this little piece of land which the people in Sandoval County were so worried about, had to worry about furnishing schools for the people, is now the site of the finest school system in our State and it has been a great commercial asset to our State. It has aided in the development of the enormous properties at Albuquerque and elsewhere in the State of New Mexico and has contributed substantially not only to our State, but Mr. Chairman, some of it has gone on into yours.

We therefore feel that the development of a national park will not be destructive to Sandoval County if it is established. I don't want to take the time of the committee because I think the present owner of the land is here to testify. I believe that the people who have talked about geothermal development can testify, and it may be that, through questioning of them, we can develop some of the answers as to the true value of this land and what might result from it.

Some question was raised as to whether the people had been warned at all about this. The hearing which we had on this was held in Santa Fe, N. Mex., on September 17. Representatives of the Bond family were notified.

Senator BIBLE. What year was that?

Senator ANDERSON. 1962. Representatives of the Bond family were notified. I called personally the widow of Franklin Bond. I talked to Gordon Bond who had some interest in this, and Mr. Savage himself was at the meeting and was given every opportunity to make a statement if he wished to do so. At this particular time I tried to let Mr. Dunigan, who is the present owner, know that the meeting was to be held and sent him a message as to when the meeting was to take place.

I think we have done what we can to notify these people that this matter is being considered. I only want to say that if the price is as high as some people think it ought to be, that I would not favor the bill. I would favor putting a ceiling on it of approximately \$950,000 for the acquisition of land, \$1 million for the acquisition of land, and

if the land cannot be acquired at that price, I am perfectly willing to let it wait until another day.

There is a cattle ranch in New Mexico with which I am very familiar and the same family has bought and sold three different times in 50 years. They have sold out at high prices and bought back at low prices, and this land would never have been priced at \$1 million only a few years back. The only reason the Bond family wanted to sell the entire piece of ground was that, in the liquidation of the estate, there was some tax advantage in making complete disposition at one time. It was for that reason that the entire tract was suggested to us, and it was suggested that the National Forest Service become participants in it and help buy the ground the Forest Service wanted.

I talked to Mr. Fredine, who is the district forester at Albuquerque. He is interested in the adjoining forest land. He felt it could be administered by the Department of Agriculture to the profit of the Government.

I think it could be and I think it would be advantageous to all of us if the transaction goes through. New Mexico has, as other Western States, the problems of what to do about watersheds and this is a very important watershed to the Rio Grande River and therefore the State has expressed the desire to see it put under the control of the Forest Service because it is thought a great deal of good would result. The part that I am talking about, however, in the purchase of the land is not involved in that. It is an area that would go to the Park Service, 30,000 acres of land, rather poor land I would believe. It is the old volcanic crater, and in flying over it recently in order to look at the Navajo Dam in New Mexico, I didn't see evidence of a changing character from the first time I saw it about 40 years ago. I believe the bill is a good bill.

I believe my colleague thinks it is a good bill. I believe with the reduced acreage it might profitably be passed.

Senator BIBLE. I thank the senior Senator from New Mexico, and I might say that I have a statement from Senator Mecham wholeheartedly supporting the bill and that will be made a part of the record at this point and then we will ask questions of the senior Senator from New Mexico, Senator Anderson.

(The document referred to follows:)

STATEMENT OF SENATOR E. L. MECHEM, A U.S. SENATOR FROM THE STATE OF NEW MEXICO

I would like to take this opportunity to urge favorable consideration by the Public Lands Subcommittee of S. 1870, a bill to provide for the establishment of the Valle Grande-Bandelier National Park in the State of New Mexico, and for other purposes.

The bill would authorize the Secretary of the Interior to acquire approximately 30,745 acres of land, to be combined with 29,655 acres in the existing Bandelier National Monument.

This acquisition would make possible the preservation and interpretation of one of the largest volcanic calderas in the world. The area became the home of prehistoric people whose way of life was adapted to the unique geological and geographical features of the area. Their environmental adaptation could be dramatically displayed in the proposed park.

I understand that development plans include construction of 13 miles of roads and 10 miles of trails, a visitor center and four main shelters, and other visitor-use facilities.

The proposed park is within convenient traveling distance of the Southwest's most urbanized areas. It is readily accessible from both the north-south and east-west interstate highway networks crossing New Mexico, and transcontinental air and rail service.

The establishment of the park, with its tremendous tourist potential, could mean much to an area needing economic development.

I respectfully urge this subcommittee's favorable action on S. 1870.

Senator BIBLE. I would like to ask a few questions so that I may be properly oriented. The Valle Grande is approximately how many miles from Santa Fe?

Senator ANDERSON. I would think it is 35 or 40 miles. There is a new road that goes through Los Alamos and I would guess it is 35 or 40 miles. It is 50 or 60 from Albuquerque or maybe more.

Senator BIBLE. The map indicates Highway 4 going through a good part of it. Is that a State highway?

Senator ANDERSON. A State road. It is pretty well improved to Los Alamos and to some extent beyond. Earlier in life I did a great deal of driving through the New Mexico mountains. In the last few years, because of the way the Congress operates, I haven't done my share.

Senator BIBLE. Might I ask as to whether or not the Senator has any idea of the annual visitation to Bandelier National Mounment? We can develop that through the Park Service people. I think someone indicated it was a little better than 100,000 a year.

Senator ANDERSON. A little better than 113,000 or something like that but that is a figure that is subject to correction by the Park Service.

Senator BIBLE. We can ask the Park Service people on that. Is there any grazing permitted within the confines of the Bandelier National Mounment or any adverse uses?

Senator ANDERSON. I think the Bandelier Monument is a little like the man who looks at the Grand Canyon and says it would be a bad place to lose a cow. I don't know whether grazing is permitted or not. It would not be the best grazing country in the world.

Senator BIBLE. The only purpose of my question was that we are tying Valle Grande to Bandelier National Monument and we are merging the two and proposing a national park on which there are no adverse uses permitted. In other words, there would be no grazing permitted, as I understand it, with the Valle Grande addition and I just wanted to be sure that the record is very clear that there would be no grazing on any part of the Valle Grande-Bandelier National Park because that is an adverse use to general park purposes.

There is nothing in this bill that permits that.

Senator ANDERSON. I am not certain what the situation is. I have been to Bandelier many times. I have never seen cattle there but that doesn't mean there couldn't be cattle there.

Senator BIBLE. I assume there would be no mining, fishing, or hunting, or are there fishing and hunting?

Senator ANDERSON. We would hope that the sort of arrangement discussed this morning would work out for fishing and hunting. There is good fishing in the Baca location No. 1. There is another area

called the Sandiago which might be developed and have good possibilities.

Senator BIBLE. My understanding is that the land to be acquired is 30,000-plus acres, the larger portion of Baca No. 1 all of which is at one location.

Senator ANDERSON. That is correct.

Senator BIBLE. I have no further questions. Senator Hayden, do you have any questions?

Senator HAYDEN. No questions.

Senator BIBLE. Senator Jordan?

Senator JORDAN. No questions.

Senator BIBLE. Senator Simpson?

Senator SIMPSON. Will there be park officials here?

Senator BIBLE. Yes. We have park officials here prepared to testify. The statement of Senator Mechem has been made a part of the record. I should likewise like to have incorporated in the record at this point the letter which I received during the noon hour from Juan Archibeque, the Sandoval County clerk, transmitting a letter from the chairman and board of county commissioners, the governing board of Sandoval County. I also have a letter from Ernest Miera, a representative in the House of Representatives of the State of New Mexico, in protest to the legislation now pending before us, and it will be made a part of the record at this point. I also have two telegrams that have been received by me that will be made a part of the record at this point.

(The documents referred to follow:)

SANDOVAL COUNTY,  
STATE OF NEW MEXICO,  
*Bernalillo, N. Mex., May 26, 1964.*

HON. ALAN BIBLE,  
*Chairman, Subcommittee on Public Lands,  
Senate Office Building, Washington, D.C.*

DEAR SIR: Enclosed are copies or original letters written by the Board of County Commissioners of Sandoval County and also of our State representative from our county. And I wish to advise you if any correspondence to be answered to them please refer to this mailing address: Juan Archibeque, Sandoval County Clerk, Courthouse, Bernalillo, N. Mex.

Truly yours.

JUAN ARCHIBEQUE,  
*Sandoval County Clerk.*

SANDOVAL COUNTY,  
STATE OF NEW MEXICO,  
*Bernalillo, N. Mex., May 26, 1964.*

HON. ALAN BIBLE,  
*Chairman, Subcommittee on Public Lands,  
Senate Office Building, Washington, D.C.*

DEAR SENATOR: The Board of County Commissioners, Sandoval County, N. Mex., in its capacity as county commissioners and in its ex officio capacity as the board of finance of said county, hereby submits its vigorous protest against the passage of U.S. Senate bill 1870. This bill proposes to create a national park out of portions of all of Baca location No. 1, townships 19 and 20 north, ranges 3, 4, and 5 east, New Mexico principal meridian. The proposed national park will deprive this country of considerable tax revenues.

A factor to be considered in support of this protest is the status of acreage owned and subject to taxation in this county. The official records of this county for 1962 show ownership of lands in Sandoval County, N. Mex., as follows:

	Acres	Percent of total
Total land area in Sandoval County.....	2, 379, 520	100
Indian tribal lands held in trust by U.S. Government for Indians and not subject to State and county taxes.....	488, 000	20
National forest lands owned by the United States and under U.S. Forest Service not subject to State and county taxes.....	324, 000	14
Other Federal lands owned by the U.S. Government and not subject to State and county taxes.....	750, 000	32
Lands of the State of New Mexico not subject to State and county taxes.....	86, 000	4
Privately owned lands subject to State and county taxes.....	723, 000	30

There are 19 Indian pueblos and Indian reservations in the State of New Mexico; 7 of these are in Sandoval County.

As the above shows only 30 percent of all the acreage in Sandoval County is subject to taxation by the State and county. This 30 percent is further reduced by exemptions for ex-servicemen; exemptions for family heads; and exemptions for religious institutions.

The Baca location, if left in private ownership, would continue to be a source of tax revenues from timber and cattle. In addition there are good prospects of increased tax revenues of a substantial amount from the Baca location because it is being seriously proposed to develop certain thermal springs on the land with a plant, the minimum cost of which will be \$10 million.

This revenue would be denied to an already impoverished county by making the Baca location property of the United States.

There are other areas in the Sandia and Jemez Mountains within Sandoval County which could be converted to U.S. property without the resulting loss in tax revenues to the Sandoval County, not to mention the Cochiti Lake Recreation Area recently approved by Congress.

It is emphasized that the people of Sandoval County whom we represent, are greatly opposed to and vigorously object to making the Baca location U.S. property and removing it from the status of private property on the tax rolls.

Respectfully yours,

JOE GABALDON, *Chairman.*  
MELITON LOVATO, *Member.*  
JOSE E. RUIZ, *Member.*  
*County Commissioners.*

STATE OF NEW MEXICO,  
HOUSE OF REPRESENTATIVES,  
*Santa Fe, May 26, 1964.*

HON. ALAN BIBLE,  
*Chairman, Subcommittee on Public Lands,*  
*Senate Office Building, Washington, D.C.*

DEAR SENATOR BIBLE: It is my understanding that a hearing is soon to be held by your committee on S. 1870, concerning the possibility of turning over to the Federal Government park and recreation department part of the Baca location No. 1 situated in Sandoval County, N. Mex., for the purpose of additional recreational areas in the southwest part of our United States.

I would like to let it be known to the members of your honorable committee that many of my constituents have registered a complaint against passage of this bill for the following reasons:

1. Of a total acreage now on the Sandoval County tax rolls of approximately 2,400,000 acres over 1,400,000 acres are owned, or held in trust by the various U.S. Government agencies such as the Forest Service, Indian service, Bureau of Land Management, etc.

2. Close to 90,000 acres of the above-mentioned total acreage is owned by the State of New Mexico.

3. Under the treaties set forth by the U.S. Government concerning Indian lands and reservations in the State of New Mexico almost 40 percent of the pueblos and their designated reservations lie within the boundaries of Sandoval

County, N. Mex. To be more specific of 19 recognized Indian pueblos in the State of New Mexico, 7 of these aforesaid mentioned pueblos are within the Sandoval County boundary lines.

4. Private lands, including the Baca location No. 1, constitute less than 30 percent of our entire acreage for tax deriving purposes. It is, therefore, quite evident that Sandoval County residents would be against the loss of almost 10 percent of tax paying property in this county. Of the above-mentioned 30 percent tax deriving lands it must be remembered that a large portion of these lands are tax exempt due to our veterans' tax exemption program, plus the exemptions granted to religious groups and organizations in our county.

We ask your kindest consideration in helping defeat passage of S. 1870.

Sincerely,

ERNEST MIERA.

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ALBUQUERQUE, N. MEX, *May 26, 1964.*

Senator ALAN BIBLE,  
Senate Office Building,  
Washington, D.C.:

We understand you are hearing Senate bill 1870 to set aside 30,745 acres Baca location to create Valle Grande Bandelier National Park. We would draw attention to the fact that this would destroy geothermal development presently underway estimated to be in excess of California development thus depriving State and Federal Government of badly needed revenues.

PLAINS ELECTRIC GENERATION & TRANSMISSION Co-OP, INC.,  
NORTON DAVIS, *Manager.*

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ALBUQUERQUE, N. MEX., *May 28, 1964.*

SENATE PUBLIC LANDS SUBCOMMITTEE,  
COMMITTEE ON INTERIOR AND INSULAR AFFAIRS,  
U.S. Senate, Washington, D.C.:

Reference to scheduled hearing on Senate bill 1870 in report on bill to Senator Jackson on March 25, Secretary Udall mentions on basis of preliminary cost data available acquisition cost of land to be about \$950,000. Entire Baca location No. 1 is subject to blanket mortgage and as the mortgagee, we respectfully suggest this preliminary cost figure as being unrealistic and too low and even if this entire amount were to be applied on note, would not feel justified in issuing partial release on the land in question from the mortgage lien. While the proposed legislation provides that the acquisition costs will be determined by and cannot be in excess of the appraised value as determined by the Secretary through contract appraisals or as determined by condemnation proceedings, in your consideration of this legislation we thought you should be advised as to our thinking so that our rights would not be jeopardized.

G. W. SAVAGE, *Trustee.*

Senator BIBLE. Our next witness will be the Park Service witness, Mr. Gordon Fredine, the Acting Assistant Director of the National Park Service.

**STATEMENT OF C. GORDON FREDINE, ACTING ASSISTANT DIRECTOR, NATIONAL PARK SERVICE; ACCOMPANIED BY J. F. CARITHERS, NATIONAL PARK SYSTEM STUDIES, NATIONAL PARK SERVICE; AND FRANK E. HARRISON, CHIEF, DIVISION OF LEGISLATION AND REGULATIONS, NATIONAL PARK SERVICE**

Mr. FREDINE. Thank you, Mr. Chairman. May I ask Mr. Harrison and Mr. Carithers to join me here as technical witnesses?

Senator BIBLE. Mr. Harrison and Mr. Carithers, will you join Mr. Fredine at the witness table?

Are you speaking from a prepared statement?

Mr. FREDINE. Yes, sir. We have a prepared statement, Mr. Chairman.

Senator BIBLE. You may proceed in your own manner.

Mr. FREDINE. Mr. Chairman, and members of the committee, I appear before you in support of this proposal to establish Valle Grande-Bandelier National Park in northwestern New Mexico.

Senator BIBLE. Will you give us your responsibility, capacity, or assignment within the National Park Service?

Mr. FREDINE. Yes; I am C. Gordon Fredine, Acting Assistant Director for Cooperative Activities. Mr. Theodore R. Swem is the Assistant Director for Cooperative Activities. He is in the West and unable to be here today. My regular duties are as Chief of the Division of International Affairs in the National Park Service.

Senator ANDERSON. Where was your home originally?

Mr. FREDINE. Minnesota, sir.

I appear before you in behalf of the National Park Service and Department of Interior in support of S. 1870 to establish Valle Grande-Bandelier National Park in northwestern New Mexico. It would unite the Valle Grande area with existing Bandelier National Monument to form a 60,406-acre national park.

We have here an unusual opportunity to obtain for public ownership, a portion of the summit of the volcanic Jemez Range. This inspiring upland area possesses such fine potential for public use that we would be negligent to let it slip away.

Senators Anderson and Mechem are to be commended for their vision in recognizing this opportunity and initiating action through S. 1870 to establish this area as a full-scale national park. The Valle Grande is a great, extinct volcano whose prehistoric explosive eruptions and tremendous collapses created a fascinating and explicit chapter in the development of its landscape. Here are thick beds of volcanic ash—products of this volcano—which blanketed the mountain slopes and, hundreds of thousands of years later, provided a perfect location for the settlements of prehistoric Indians. Here is unspoiled scenery in a mountain setting—grassy valleys, wooded hills, and running streams—situated close to population centers, and perfectly adapted to outdoor recreation. This, then, is an area doubly significant to our country, for its geologic and archeologic values, and for recreation as well.

Senator BIBLE. You state there that it is close to population centers. Will you amplify that and give us the figures?

Mr. FREDINE. Yes, sir; we will be pleased to. Albuquerque, N. Mex., has a population of approximately 250,000 persons.

Senator BIBLE. How far is that from the proposed Valle Grande-Bandelier National Park in round figures?

Mr. FREDINE. Let me go about it this way. Santa Fe is actually 46 miles from Valle Grande and the distance from Santa Fe or from Albuquerque to the park is approximately 85 miles by the most direct route, which is a winding road.

Senator BIBLE. Very well. What is the population of Santa Fe?

Mr. FREDINE. About 45,000.

Senator BIBLE. The population of Los Alamos is in the neighborhood of 15,000. How far is Los Alamos?

Mr. FREDINE. I would guess it is not much farther than 15 miles.

Senator BIBLE. You may have other figures that you want to produce for the record in support of your statement. This is close to

population centers. Are those the three cities you have in mind or are there others?

Mr. FREDINE. Yes, sir, those are the three cities but for the sake of accuracy we would like to submit an accurate statement for this purpose.

I will sketch in the past of this area and show why the time is now ripe to let it fulfill its highest and best function. For more than a century the Baca location No. 1, a square, 100,000-acre tract on the collapsed summit of the Jemez Mountains, has been in private ownership. It has been managed primarily as a summer range for sheep and cattle, and more recently for timber production as well.

Development has been minor, and the land has retained its scenic value. But it has not been available to the public. Meanwhile, much of the surrounding land on the mountain slopes has been dedicated to public ownership and use. The Jemez Forest Reserve, now part of the Santa Fe National Forest, was established in 1905, and since that time has been managed in appropriate and traditional fashion by the Forest Service. Long before the turn of the century, evidence of prehistoric Pueblo Indian occupation in the canyons and on the mesas and mountain slopes was recognized and valued. In 1916, President Wilson established Bandelier National Monument to protect and preserve the most important and significant ruins, lying southeast of Baca location No. 1.

The bill would include the existing national monument, in its entirety, as a part of Valle Grande-Bandelier National Park.

In recent years, increased geologic investigation has given emphasis to the volcanic story of the Jemez Mountains. Now the full story has emerged with some clarity. We know that less than a million years ago catastrophic eruptions of the already existing Jemez volcano disgorged some 50 cubic miles of ash and pumice, blanketing nearly 400 square miles of the surrounding area with deposits up to 1,000 feet thick.

Left unsupported, the mountain summit collapsed into the void below, forming a caldera 12 to 15 miles in diameter. The Valles Caldera is one of the world's largest. Resurgent activity within the volcano squeezed out hills of pasty rhyolite lava within the caldera, and lifted and deformed its floor. One volcanic crater is evident—El Cajete (meaning the tub)—was the source of so-called popcorn pumice and a glass flow that are the most recent products of this volcano. There is no activity today, and only a few hot springs and sulfurous vents are left to remind us of the lingering heat still present beneath the surface. After the caldera was created, and until erosion breached the rim on the south and west in relatively recent times, lakes of various ages and sizes covered the lower parts of the floor. The topograph of the most recent lakes is discernible in the open valleys of the caldera.

Today the rim, the rhyolite hills, and the upthrust pieces of the caldera floor are mostly wooded, and the fossil lake bottoms are the grassy meadows through which small streams meander to join the Jemez River. It is this section of the mountain—the picturesque and geologically significant caldera—that is embraced by the Baca location No. 1. Acquisition of the southeastern portion of this area, a

strategic recreational and inspirational tract, is the key to full public enjoyment of the Jemez Mountains area.

Under the provisions of this bill, enough of the Valles Caldera will be enclosed in the national park to make the geologic story clear. The park will include such significant features as the Caldera's largest lakebed valley (the Valle Grande), part of its rim, the summit of its highest block of upthrust floor (Redondo Peak), and its most recently active crater (El Cajete).

Outside the caldera, the entire drainage of el Rito de los Frijoles, which heads at the southeast rim and is the stream through Bandelier National Monument along which the major prehistoric occupation occurred, would be enclosed within the park. Along its length, Frijoles Canyon is walled by cliffs of ash and pumice blown from the volcano.

S. 1870 provides authorization to acquire the 30,745-acre tract, approximately one-third of Baca location No. 1, which in 1962 the U.S. Forest Service appraised when pending legislation would have authorized Federal acquisition of the entire almost 100,000-acre area.

Senator BIBLE. At that point might I ask a question. Do I understand that the land around Baca location No. 1 is entirely in Federal ownership, either the Santa Fe National Forest or the Atomic Energy Commission?

Mr. FREDINE. Yes, including Bandelier National Monument on the south.

Senator BIBLE. Including Bandelier National Monument on the southeast?

Mr. FREDINE. Correct, sir.

Senator BIBLE. There is no other private owner surrounding this particular area?

Mr. FREDINE. I am quite sure that is correct. It is all Federal.

Senator BIBLE. I am sure the owners will testify, but I assume that whatever rights they have in running cattle are primarily through the Santa Fe National Forest, through the Forest Service; is that right? Is this a home-base ranch that runs its cattle beyond the borders of Baca location No. 1?

Mr. FREDINE. I am not qualified to say definitely. Baca location is a large location, and it is possible that a home location within the total of almost 100,000 acres could support itself, but it is quite likely that some of the grazing operations may be based in the national forest.

Senator BIBLE. Very well. We can develop that through the owners I am sure. You may proceed.

Mr. FREDINE. Our valuation of the land which we furnished to the committee was arrived at by proportionately reducing the original Forest Service figure and adding an estimated value of timber rights and certain improvements. A formal appraisal of this tract may yield higher or lower values. Obviously, negotiations with the owners cannot be considered in advance of authority.

The National Park Service does not plan any intensive development in the new Valle Grande area. Development expenditures for this area of \$1,368,500 over the first 4 years are called for, and annual operations and maintenance costs will be about \$60,000. Overnight

and related accommodations operated by a concessioner are already available in Bandelier National Monument.

We will seek to preserve the significant natural features, to establish camp grounds, picnic areas, interpretive exhibits, and trails for hiking and horseback riding, and to install and improve access and circulation roads and scenic overlook sites. The area's excellent streams will be open to fishing, subject to regulation by the State of New Mexico, and skiing will be an outstanding wintertime attraction.

To sum up, then, the Department of the Interior strongly endorses S. 1870, with one clarifying amendment, as spelled out in this Department's report on the bill.

There is no doubt that the people of our Nation will benefit if the Valle Grande area is dedicated to public ownership. The Valle Grande-Bandelier National Park will display a segment of the Jemez Mountains, from caldera to base, where the great volcanic story can be told, and the cliff and open pueblo ruins of the existing Bandelier National Monument. Here tomorrow's visitors can have a fascinating glimpse of the forces that shaped the earth and of prehistoric man's adaptation to his environment.

We respectfully urge prompt, favorable action on S. 1870 by this committee and the Congress.

Thank you.

Senator BIBLE. Thank you for your statement, Mr. Fredine. Can you check out my recollection as to the annual visitation of the Bandelier National Monument?

Mr. FREDINE. Yes.

Senator BIBLE. How many people visited there in 1963?

Mr. FREDINE. In 1963 it was 113,000.

Senator BIBLE. 113,000?

Mr. FREDINE. And we anticipate that by about 1970 this will increase to around 150,000 for Bandelier alone.

Senator BIBLE. When was Bandelier first created?

Mr. FREDINE. I believe it was in 1916 by President Wilson.

Senator BIBLE. Are there any adverse uses within the Bandelier National Monument that will pose a problem if this is merged and made a national park rather than a national monument? I have in mind grazing. I have in mind mining. I have in mind timbering. I have in mind hunting. I have in mind fishing.

Mr. FREDINE. There is no grazing, no mining, no timbering. There is fishing, but there is no hunting. There are no adverse uses in the usual sense of the word.

Senator BIBLE. So if the two were merged this would follow exactly a pure national park concept?

Mr. FREDINE. That is correct.

Senator BIBLE. Senator Anderson.

Senator ANDERSON. No questions. I was going to ask the same questions you have. There never has been grazing in Bandelier National Monument. It would not be the most ideal grazing spot in the world, would it?

Mr. FREDINE. It is a very rough and rugged area with the sharp canyons penetrating from the rim of the old volcano down to the Rio Grande River.

Senator BIBLE. Senator Hayden, any questions?

Senator HAYDEN. No questions.

Senator BIBLE. Senator Jordan?

Senator JORDAN. Yes. On page 4 of your statement you refer in the last paragraph to an appraisal which was made in 1962 by the Forest Service for the entire tract of 100,000 acres.

What was the amount of that appraisal?

Mr. FREDINE. May I refer to my notes here for a moment. My information is that the soil value, not including timber values, was within the range from \$2,100,000 to \$2,250,000 for the entire area.

Senator JORDAN. Then you go on to say "our valuation to the committee was arrived at by proportionately reducing the original Forest Service figures." Because you are only talking of about a third of it now; is that correct?

Mr. FREDINE. A little less than a third.

Senator JORDAN. And adding an estimated value of timber right and of certain improvements.

Mr. FREDINE. That is correct.

Senator JORDAN. That is the way you get it, taking about a third of the area and adding timber and improvement, you come up with your estimate of something like \$1 million.

Mr. FREDINE. That is correct, sir.

Senator JORDAN. That wasn't clear to me. Now on your next page at the top of the page you mention a development expenditure for the area of \$1,368,500 over the first 4 years. What are you going to spend that money for?

Mr. FREDINE. We have a statement here, a schedule of developments that we would be glad to give to the recorder, and I can list these for you orally now. If you want just the basic figures, I can break them down this way at the outset, and then I will be glad to answer any details. The total cost of buildings and utilities that would be developed would amount to \$438,500.

The total roads and trails that would be developed would cost \$930,000. These two figures together make the total of \$1,368,500.

Senator JORDAN. Will you put the detail in the record at this point?

Mr. FREDINE. We will be very pleased to do that.

(The document referred to follows:)

*Jemez or Valle Grande National Park (proposed)*

DEVELOPMENT SCHEDULES

	1st year	2d year	3d year	4th year	5th year	Future years	Total
ROADS AND TRAILS							
Park roads:							
Valle Grande-Valle Jaramillo, 8½ miles at \$50,000 per mile	\$120,000	\$390,000					\$510,000
Valle Grande-El Cajete, 3 miles at \$80,000 per mile			\$240,000				240,000
Picnic area roads, 1 mile at \$50,000	20,000	15,000	15,000				50,000
District headquarters circulation roads, 1 mile at \$50,000	50,000						50,000
Obliteration of dirt roads, 30 miles at \$1,000 per mile		15,000	15,000				30,000
Trails:							
Redondo Peak, 4 miles at \$5,000 per mile		20,000					20,000
Pajarito Ridge Overlook, 5 miles at \$5,000 per mile			25,000				25,000
Banco Bonito Nature Trail, 1 mile at \$5,000				\$5,000			5,000
<b>Total</b>	<b>190,000</b>	<b>440,000</b>	<b>295,000</b>	<b>5,000</b>			<b>930,000</b>
BUILDINGS AND UTILITIES							
Valle Grande Overlook:							
Exhibit shelter and exhibits (exhibits, \$7,500)	17,500						17,500
Comfort station	11,000						11,000
Sewer and water	20,000						20,000
District headquarters:							
Visitor center-office and exhibits (exhibits, \$15,000)		65,000					65,000
Utility building		20,000					20,000
Residences, 3		40,000	20,000				60,000
Seasonal quarters (8-unit)			100,000				100,000
Utilities: water and sewer, power and radio		85,000					85,000
Redondo Peak: Shelter, exhibits, pit toilets (exhibits, \$4,500)			15,000				15,000
Pajarito Ridge: Shelter, exhibits, pit toilets (exhibits, \$4,500)				15,000			15,000
El Cajete: Shelter, exhibits, pit toilets (exhibits, \$3,000)				12,500			12,500
Picnic areas, El Cajete, Valle Grande Overlook, Cerro Pinon (30 tables, total)	4,000	3,000	3,000				10,000
Miscellaneous: Signs	2,000	2,000	2,500	1,000			7,500
<b>Total, buildings and utilities</b>	<b>54,500</b>	<b>215,000</b>	<b>140,500</b>	<b>28,500</b>			<b>438,500</b>
<b>Total, roads and trails</b>	<b>190,000</b>	<b>440,000</b>	<b>295,000</b>	<b>5,000</b>			<b>930,000</b>
<b>Total, construction</b>	<b>244,500</b>	<b>655,000</b>	<b>435,500</b>	<b>33,500</b>			<b>1,368,500</b>

Senator BIBLE. I would ask one question at this point, Mr. Fredine. Have you projected an annual visitation when you combine Bandelier and Valle Grande and make it a national park rather than a national monument? As I understand it, you had 113,000 visiting Bandelier National Monument in 1963. You project that to reach a figure of 150,000 in Bandelier alone in the next several years. Now when you put the two together and make your national park, do you have any forecast as to the projected visitation.

Mr. FREDINE. I will be glad to make one.

Senator BIBLE. You quite often do this?

Mr. FREDINE. Yes.

Senator BIBLE. In substantiating and in making a presentation, a justification for a national park, and I think it is well that you do it, because it does indicate to my mind at least that this somewhat offsets some of the tax losses. I think there are tax losses in these problems, but very often they are offset by increased tourism.

I am wondering if you have any projections in the next say 5 years from now or however you work out in combining the two.

Mr. FREDINE. I can say this. Taking into consideration what we are quite confident will be the increase in travel by the American public, adding to this the increasing attractiveness of this area due to the addition of the Valle Grande and the development there of camping grounds and opening the area to fishing and the attractions that are inherent in this addition to Bandelier National Monument to make a national park, we could anticipate within the next 10 years that the total visitation would approximate 250,000 a year.

Senator BIBLE. Thank you. The Senator from Wyoming.

Senator SIMPSON. Mr. Fredine, I notice, though I didn't have the benefit of all your statement, that you say the National Park Service did not plan any extensive development in the Frijoles Grande National Area. Is that the one in green?

Mr. FREDINE. Surrounded by the dark green border; yes, sir. We anticipate building roads to the principal overlook and attraction areas, campgrounds, picnic areas, a small visitors center and shelters for interpretive exhibits and matters of that kind. The complete record of the developments have been made a part of the record.

Senator SIMPSON. This has been under the jurisdiction of the Forest Service for the most part adjacent to the privately owned land, has it not?

Mr. FREDINE. I don't think I quite understand your question but the Forest Service has not had jurisdiction over Baca location No. 1.

Senator BIBLE. His question was surrounding it.

Mr. FREDINE. Surrounding it yes. With the exception of the holdings of the Atomic Energy Commission on the east side of Baca location No. 1 and north and east of Bandelier, the Santa Fe National Forest surrounds Baca location on the north, on the west, and on the south.

Senator SIMPSON. Your proposal is to take 30-some thousand acres in the southeast portion of the privately owned land.

Mr. FREDINE. That is correct.

Senator SIMPSON. Why is it needed for park purposes?

Mr. FREDINE. Well, there are several ways to answer this. I would say that it is needed because of the growing demands of the people of the United States for adequate recreational opportunities, and the growing awareness of the importance of preserving intact and preserving the integrity of certain outstanding national scenic areas of our country.

Senator SIMPSON. Couldn't you do that with a scenic easement?

Mr. FREDINE. I presume that as far as the scenic qualities are concerned, this is so.

However, a scenic easement would not necessarily permit people to enter the area of private land and to enjoy it to the full extent that they could if it became a national park.

Senator SIMPSON. I don't think I will agree with you on that statement, but by the same token you made it. Wouldn't this land south of the sought for area be just as valuable to us as the one that is now already under Government control south of the area? Wouldn't that be as good for park purposes as this smaller area that you visualize in the southeast corner of the privately owned land?

Mr. FREDINE. We do not think so. The statement shows that one of the prime reasons for adding this 30,000-plus acres to the park is to include this very unusual crater and the formations that are associated with it.

Senator SIMPSON. It is not going to leave there, and couldn't the scenic easement do it just as well as to be taking private property which would take it off the tax rolls in the county? From the letter I read, a very substantial portion of the tax property of that area would be taken off the tax rolls.

Mr. FREDINE. Well, we believe that the scenic easement would also have to protect the basic integrity of the area, prevent erosion, prevent overgrazing, and prevent destruction from other manmade causes.

This could possibly be true, with the one exception that I mentioned before, that possibly people would not have the opportunity to enjoy it on the ground as they would if it were public property.

Senator SIMPSON. Have you made any investigation to determine what the acquisition of this land would do to the county tax base?

Mr. FREDINE. We have some general information on the amount of taxes that has been paid by the Baca Land Co., but we cannot state with accuracy what the present tax picture is because our data are a few years old.

Senator SIMPSON. Have you any idea—I just want to get this information in the record—do you have any idea how many jobs would be lost because of the acquisition?

Mr. FREDINE. No. I can tell you how many jobs would be added.

Senator SIMPSON. You are aware that this county is in a distressed area and comes under the ARA, are you not?

Mr. FREDINE. I understand this is correct.

Senator SIMPSON. Doesn't it seem rather peculiar that you would take land off the tax rolls of a county which is under the designation as a distressed area, and reduce it further into a distressed area?

Mr. FREDINE. Senator Simpson, we recognize that people who now occupy this 30,000 acres may be displaced.

However, we would create job opportunities not only through employment in the area itself, but in the construction of more than \$1¼

million worth of developments there during the next 4 years, and of course the revenues that would be brought or the cash expenditures that would be made in the area by people visiting the new national park we believe would more than offset such losses.

Senator SIMPSON. Even if the county goes out of existence?

Mr. FREDINE. I can't anticipate that the county will go out of existence.

Senator SIMPSON. I think that is all, Mr. Chairman.

Senator ANDERSON. Could you furnish the statement showing what Bond paid for Baca location No. 1 in taxes a few years ago?

Mr. FREDINE. Yes. We probably have these data here if you would like to hear them.

Senator BIBLE. I think it is a perfectly proper part of the development of our hearing, and I am particularly interested in knowing the valuation. Certainly they are really public records, because you have to record the deeds and the deeds have to carry stamps which show that the purchasers paid for it, and I think this would be helpful to the committee.

Preliminary to that, I wish you would tell me what the population of Sandoval County is. I don't think we have that in the record.

Mr. FREDINE. I am sorry, sir, I do not have the county population figures, but we shall provide this for the record.

Senator BIBLE. I wish you would supply that for the record. Is Los Alamos within Sandoval County?

Mr. CARITHERS. I think that is Los Alamos County.

Senator BIBLE. Supply it for the record. I am under the impression that Sandoval County has something in the neighborhood of 2,500 or 3,500 people.

Senator ANDERSON. No, it is more than that.

Senator BIBLE. Would it be considerably more than that? Well, anything not much more than that. Anyway supply it for the record so we know its population.

Mr. FREDINE. We shall provide the 1960 census data.

(The information requested is as follows:)

DEPARTMENT OF THE INTERIOR,  
NATIONAL PARK SERVICE,  
Washington, D.C., June 9, 1964.

HON. ALAN BIBLE,

*Chairman, Subcommittee on Public Lands, Committee on Interior and Insular Affairs, U.S. Senate, Washington, D.C.*

DEAR SENATOR BIBLE: Reference is made to the hearing conducted by your subcommittee May 29, 1964, on S. 1870, the bill to authorize establishment of Valle Grande-Bandelier National Park in New Mexico.

During the hearing, the subcommittee requested supplementary information regarding the proposed park's proximity to roads and highways and to nearby centers of population.

Accompanying this letter is a map showing the proposed park, its access via State Route 4, and the mileage to the nearest principal highways and communities. The distance figures are approximate road miles from the proposed park entrance on State Route 4 at the Sandoval-Los Alamos County line.

It should be noted that U.S. 66, a famous and well-traveled transcontinental highway, coincides with a new, controlled-access superhighway, Interstate 40, in the vicinity of Albuquerque, some 105 miles to the south of Valle Grande-Bandelier. Interstate 40 spans the continent, running from Barstow, Calif., to Greensboro, N.C. At both ends, it links with other interstate routes which carry traffic to the coasts.

Another superhighway, Interstate 25 (north-south), passes through Albuquerque also, and through Santa Fe, some 56 miles east of the proposed parksite. Populations of the three municipalities, of the counties containing each, and of Sandoval County, which contains most of Baca location No. 1, follow: (All are from the 1960 U.S. census.)

City	Population	County	Population
Albuquerque (105 miles) -----	201,189	Bernalillo.....	262,199
Santa Fe (46 miles) -----	34,676	Santa Fe.....	44,970
Los Alamos (15 miles) -----	12,584	Los Alamos.....	13,037
		Sandoval.....	14,201

We believe this complete the information requested regarding the Valle Grande-Bandelier National Park proposal. If there is anything further we can furnish, please call on us.

Sincerely yours,

JACKSON E. PRICE,  
*Acting Director.*

Senator BIBLE. Now will you respond to the question of Senator Anderson?

Mr. FREDINE. Yes, our information is that a total of \$2,712.88 was paid in State and county taxes by the owners of the Baca location No. 1 in 1960.

Senator SIMPSON. Would you give that again, sir?

Mr. FREDINE. A total of \$2,712.88 was paid in State and county taxes by the owners of the Baca location No. 1 in 1960.

Senator ANDERSON. You are taking about a third of that ground.

Mr. FREDINE. Yes. Assuming the portion which is intended for acquisition to the park is taxed at the same rate, State and county taxes would be approximately \$830 on the area under consideration.

Senator BIBLE. Might I ask one supplementary question at that point? Do you have any record of the number of cattle that the Baca location No. 1 carried in 1960, what the carrying capacity was?

Mr. FREDINE. The information we have, sir, is that the grazing permit or lease on the total area was for a minimum of 2,000 head and a maximum of 4,000 head. I cannot tell you exactly how many cattle have been run on the area.

Senator BIBLE. But they had permitted rights ranging between 2,000 and 4,000?

Mr. FREDINE. That is correct.

Senator BIBLE. For Baca location No. 1?

Mr. FREDINE. Right.

Senator BIBLE. Was that entirely for cattle? Do they run sheep in this area?

Mr. FREDINE. I cannot be sure, but I believe it was entirely for cattle.

Senator BIBLE. Entirely a cattle spread?

Mr. FREDINE. Perhaps with horse stock pertaining to the cattle operation.

Senator SIMPSON. I am interested in your figure about the \$2,700 and then the sudden reduction by what you are going to acquire to \$800.

How did you arrive at that?

Mr. FREDINE. I would have to do a little arithmetic, sir, but \$830 is a little less than one-third of \$2,712.

Senator SIMPSON. Is the land all of the same nature in this area?

Mr. FREDINE. It is of the same general character.

Senator SIMPSON. Is Baca No. 1 of greater or less value than the outer perimeter?

Mr. FREDINE. There would be differences in value. The Valle Grande portion itself contains more grassland than the other portions of Baca location.

Senator SIMPSON. I understood that some of it is totally unyielding and that it is an area that is no good at all according to some testimony I have heard.

Mr. FREDINE. There are some areas in the Baca location No. 1 that are over 11,000 feet in elevation, and very rocky and very rough, so I am very certain that there is a goodly portion of the total that is not of high value.

Senator SIMPSON. Are there any improvements on this, Mr. Fredine?

Mr. FREDINE. Yes, there are some improvements.

Senator SIMPSON. Have you taken that into consideration in arriving at this one-third business?

Mr. FREDINE. Yes, sir. I will be glad to give you what our figures are on the existing values. We estimate that the total value of improvements is \$93,000.

Senator BIBLE. That figure represents what, \$93,000 of improvements.

Mr. FREDINE. Buildings, dwellings, corrals, stock, tank, fences, cottages, and an eight-room lodge.

Senator BIBLE. Located where?

Mr. FREDINE. They are within the Valle Grande portion.

Senator BIBLE. Within the portion proposed to be taken?

Mr. FREDINE. Yes, sir.

Senator SIMPSON. I take it then you disagree with the estimate of the mortgagee with respect to the valuation of this property?

Mr. FREDINE. The only information we have about that estimate is that which Senator Anderson gave us orally today.

Senator SIMPSON. That is all I have.

Mr. FREDINE. And we were not aware of it before. They would not seem to agree.

Senator BIBLE. Further questions of the Park Service witness?

Thank you very much, gentlemen. Your testimony has been very well given.

Mr. FREDINE. Thank you, sir.

Senator BIBLE. Our next witness will be James P. Dunigan, of Abilene, Tex., accompanied by Mr. Ken Boren, reservoir engineer.

Gentlemen, do you have prepared statements?

Mr. DUNIGAN. Yes, sir, and they have been given to the staff.

Senator BIBLE. Thank you very much. Just be seated there, make yourselves comfortable and relaxed. Mr. Dunigan, you appear first on this roster of witnesses so will you proceed? We have your full statement in front of us.

First identify yourself.

STATEMENT OF JAMES P. DUNIGAN, ABILENE, TEX.; ACCOMPANIED  
BY KEN BOREN, RESERVOIR ENGINEER

Mr. DUNIGAN. Mr. Chairman, members of the committee, I am inexperienced at testifying.

Senator BIBLE. Don't feel at all nervous. We want you to be relaxed. Why don't you read the testimony. I notice the length of it. It is about 19 pages long but you have a story to tell.

Mr. DUNIGAN. I would like to tell it.

Senator BIBLE. We are going to hear you through. If there are areas that are completely repetitious we might ask you to omit part of it, but you read right from the start and we will see how we get along that way.

Mr. DUNIGAN. I thank the chairman.

My name is James P. Dunigan.

Senator BIBLE. Before you start, let's see if we can't get these mikes adjusted so we can hear you. I can hardly hear you.

Mr. DUNIGAN. My name is James P. Dunigan and I appear as representative of the owners of the Baca location No. 1, located in Sandoval and Rio Arriba Counties, N. Mex. This ranch consists of 99,289 acres and is owned one-half by Dunigan Tool & Supply Co., which is a family and employee-owned corporation, and by a partnership known as Baca Land & Cattle Co., which consists of James P. Dunigan, J. B. Harrell, Jr., W. S. Gullahorn, F. M. Harrell, George Thompson III, and my son Mike Dunigan. With the exception of my son and George Thompson III, the other partners are employees of mine.

I am appearing today on behalf of the owners of the Baca location No. 1 to oppose the acquisition of approximately 30,745 acres of our ranch to create the Valle Grande-Bandelier National Park, under S. 1870. I propose to give the reasons why I feel that it is not in the best interest of either the owners of the ranch, the State of New Mexico, the citizens of Sandoval and Rio Arriba Counties, or the taxpayers in this country to take this prime ranchland and one of the finest geothermal prospects in the United States out of private ownership and place it in the public domain.

The first time I saw the Baca location in October 1962, I knew that it was indeed a unique piece of land and the most exciting and challenging prospect that I had ever encountered in my business career. After studying all the aspects of this land for several months, I was finally able to purchase it from the Bond Estate in early January 1963. This land had been in the Bond family since 1918 and had supplied summer grazing for approximately 6 months out of the year for the cattle and sheep from their several ranches at the lower elevations. The Baca location has always been recognized as one of the finest summer ranges in the United States and it is without peer for grazing land in New Mexico.

I become so intrigued with the prospects of this land that my purchase of it was actually made at considerable sacrifice to my other business interests. The prospect and challenge of working at improving this ranch and the satisfactions to be derived from this were the con-

trolling factors in the acquisition. I am hopeful that it is the place where I will be able to live the rest of my life, rear my family, and work at this vast project that can never be completed in a lifetime. These desires are shared by each of my partners and associates.

When we first purchased this ranch, we naturally gave study to all of the possibilities of its development. We considered not only the ranching, farming, and geothermal potentials, but we also retained a firm of consultants to study the entire acreage with a view of obtaining recommendations as to its value and as to what was the highest use to which it could be placed. This study included the possibility of use for recreation, homesites, ski villages, a retirement project, and many, many others. Our study indicated many opportunities for profitable ventures if we cared to pursue them, but as we grew to know and love this place more, the prospect of commercial ventures became less and less appealing to the point that we have firmly abandoned any thought of use for this land other than the following:

First, we hope to develop the potential of our geothermal reservoir with the view of building generating plants to serve the growing economy of New Mexico, and in fact to be able to furnish power to the four-State grid system with its center in northwest New Mexico near Shiprock—with connecting laterals to Arizona, Utah, Colorado, and New Mexico. Our ranch is less than 18 air miles from a major leg of this grid system.

Senator SIMPSON. May I interrupt, Mr. Chairman?

Senator BIBLE. The Senator from Wyoming.

Senator SIMPSON. This geothermal utilization for power is nothing new, is it? It is being done in California now, isn't it?

Mr. DUNIGAN. It is being done, Senator Simpson, in California in the northern portion. It is preparing to be done in the southern Salton Sea area in California, and has been done since the turn of the century in Italy, and since 1952 or 1953 in New Zealand.

Senator SIMPSON. Is there any cheaper form of power known?

Mr. DUNIGAN. It is the cheapest.

Well, hydro could conceivably be cheaper than geothermal, but it is certainly cheaper than any of the fossil fuels that are used to supply most of the power in this country.

Senator SIMPSON. How do you know if you have any or not? Are we going to have any testimony with respect to that?

Mr. DUNIGAN. Yes, sir. I have Mr. Boren, who I presume plans to present some testimony both as to our expenditures, and geothermal prospects.

Senator SIMPSON. Don't let me interrupt further. Go right ahead.

Mr. DUNIGAN. Second, we hope to develop the ranching potential to its maximum.

And I might point out, because I refer to it a number of times, that this is the area immediately adjacent but south of this highway, and in this forest access road along this area off of the highway and not overlooking or in any way impairing the grandeur of Valle Grande.

Senator BIBLE. For all practical purposes, you are the owner of Baca location No. 1, isn't that right?

Mr. DUNIGAN. Yes, sir.

Senator BIBLE. Either in your capacity as a member of the corporation or as a part of a partnership?

Mr. DUNIGAN. That is correct. I am president of Dunigan Tool & Supply Co., and principal and managing partner of Baca Land Cattle Co.

Senator BIBLE. But you are almost Baca Land & Cattle Corp.?

Mr. DUNIGAN. That is correct. I have partners and a board of directors, but I speak for them at this time.

Senator BIBLE. What is your ownership? Are you a 90-percent owner, 80-percent owner, 75 percent?

Mr. DUNIGAN. No, sir. I own personally and in trust of the corporation probably close to 50 percent, and of the partnership in the neighborhood of 70 percent.

Senator BIBLE. So you have a majority stock interest all the way through, don't you?

Mr. DUNIGAN. Well, I don't have actual stock control of Dunigan Tool & Supply Co. It is a family corporation; yes, sir.

Senator BIBLE. I understand, but as far as this operation is concerned here, once you make a decision, you don't have to rely on whether or not the stockholders particularly agree with you.

Mr. DUNIGAN. Well, no, that is not correct, sir.

Senator BIBLE. I mean you consult them.

Mr. DUNIGAN. Yes.

Senator BIBLE. But I mean if it comes down to a vote, you have the vote.

Mr. DUNIGAN. Well, the way we have done it since half of this ownership is by Dunigan Tool and one-half is by Baca Land & Cattle Co., which I do own the major interest of, we have picked a member to represent Dunigan Tool & Supply Co. to give some diversity of interest in their partnership dealings. I represent the partnership portion and I have an uncle, Eddie Dunigan, who represents the corporation.

Senator BIBLE. Thank you.

Mr. DUNIGAN. Third, there is a portion of this land known as the Dome Road area, which would be ideally suited to the development of both permanent and seasonal homesites and recreational facilities for the public. We have studied and are seriously considering putting this plan into action. The Dome Road is south of Highway No. 4, and is thus separated from most of the ranch and cattle operations. This is a very logical location for development purposes in that it would not interfere with our cattle and geothermal plans. This area is outside of the caldera and is therefore not considered to be the prime geothermal prospect. The Dome Road area is only a relatively few miles from Los Alamos proper, and there has been a great deal of interest shown by people of this community for possible homesites and recreational facilities in our ranch area. I wish to clarify that the area under consideration is off the highway and not overlooking the Valle Grande. This area is within the 30,745 proposed acres to be acquired by the Park Service for inclusion in the national park.

We feel very strongly that nothing should mar the beauty of the Valle Grande, and we have concluded once and for all that nothing should be built that would in any way detract from the grandeur and natural beauty of the Valle Grande. If profit were our only motive, I can assure you that we could already have disposed of substantial tracts of lands in the Valle at figures exceeding the cost of

acquisition set out in a letter of March 25, in which the Interior Department recommends approval of this bill.

At the time it was announced that a group of Texans had bought the Baca location, rumors and speculations were rampant as to our motives and plans. I wish to take this opportunity to set one phase of these conjectures straight while before your committee. It was suggested by people who had never talked with any of the owners that we were possibly buying this land with a view to speculation and ultimate resale to the Government because under previous bills it had been considered for purchase by the Parks Service and the Forest Service. We never contemplated for one moment attempting to sell this land to the Government at any price, inflated or otherwise. No one associated with the owners of this ranch has ever been involved in any land speculation, subdivision, promotion, or any real estate business. We still feel the same, and we hope that efforts to secure any portion of this ranch will soon be dropped so that we may get on with the business of running the ranch and steam development with its attendant contribution to the development of Sandoval and Rio Arriba Counties and New Mexico in general.

I think further evidence of our desires of permanency in connection with the Valle Grande, and in particular the area under consideration in this bill, is the fact that during the past summer we have expended \$217,036 on this portion of the ranch alone.

Senator BIBLE. That is the area in the dark green?

Mr. DUNIGAN. That is correct, sir.

Senator BIBLE. You are saying you actually expended \$217,036 on that part of the property?

Mr. DUNIGAN. That is correct.

Included in this figure are expenditures for homes and a lodge headquarters and other improvements for our operation. We plan, in addition to our objectives of ranching and geothermal development, the use of our facilities for the recreation and enjoyment of our employees. We have 125 people working directly for the owners of this ranch.

Senator BIBLE. Those working now at and about Baca location No. 1 aren't connected with your Texas operations?

Mr. DUNIGAN. No. These are employees of Dunigan Tool & Supply Co., and the partners who are involved in Baca Land & Cattle Co. I will explain the setup on the ranch.

Senator BIBLE. All right. None of these are in New Mexico?

Mr. DUNIGAN. None of these are in New Mexico.

Senator BIBLE. All right.

Mr. DUNIGAN. Well, there are number of them living in New Mexico but not anywhere near this large percentage of people.

Each of the owners, these are the partners and many of the associates in the corporation, has plans to develop homes on the ranch and in time to be able to live permanently at the ranch and to raise their families in this tremendous country.

My 11-year-old son has lived all of his life in the city, leading the normal urban life. He spent last summer at the ranch and I am delighted to say that he learned to work for the first time and loved it. As much as I would have enjoyed having him go with me every day on my rounds, I found him drawn to the cowboys. He rode with them, ate with them, and I am sure learned what it means to work. It was

one of the most gratifying experiences of my life, and he has thought of little else but to finish this school year so he could get back on the ranch.

Last summer when I told him of the introduction of this bill to acquire the heart of the ranch, he was quite honestly inconsolable. He couldn't understand that it was possible for you to have to give up something you own even if you were not agreeable to selling it. It was impossible for me to explain this to a child.

I may be somewhat childlike myself, but frankly I cannot understand it, either, in this instance. I am in no way challenging the Government's right of eminent domain and I would never suggest that it does not have these rights in matters of national defense, water conservation, highway construction, and other essential Government functions. I also acknowledge that there is need for public recreation areas and I am in full accord with the development of these areas. Some of the most beautiful and scenic lands in this country immediately surround this ranch. On three sides we are bounded by the Santa Fe National Forest containing 1,250,000 acres. Adjoining us also is the Bandelier National Monument containing approximately 30,000 acres. Los Alamos County, with its ski runs and beautifully forested lands, contains 70,800 acres.

The Santa Clara Indian Reservation, with public camping and recreational facilities, also adjoins the Baca location. The national forests adjoining us have some of the finest streams and camp areas any place in the western half of the United States. Bandelier National Monument has excellent camping facilities. As a matter of fact the Forest Service with our approval is presently using some of the ranch in connection with its Jamez campgrounds.

With over 58 percent of all of New Mexico now consisting of Federal, State, or Indian lands, it hardly appears essential that the Government acquire an additional 30,745 acres out of a working ranch because it has a beautiful mountain meadow and is part of a large caldera. The study of this caldera is evident in many parts of the Santa Fe National Forest and Bandelier National Monument.

Prior to buying this land, we were told that there had been a previous bill introduced to acquire this entire ranch. It was my understanding that this bill had died in committee with the close of the 87th Congress. I was not seriously concerned at the time, because I was also advised that the bill was merely one authorizing the Government to negotiate for the purchase of the ranch. We did not object to this approach, because we could merely say that we were not interested in selling it, should it have ever gotten to that point. In fact, when we first purchased this ranch I made the statement, and it was published in the newspapers, that the Government was not precluded from taking this matter up with us directly.

Prior to the conclusion of this presentation, I plan to present a suggestion which should afford the public and the Government much of what they are seeking by virtue of this bill, but at a very substantial saving in cost.

Senate bill 1870, and the recommendation of the Interior Department in their letter of March 25, 1964, addressed to Senator Jackson, is far from a bill which would authorize the parks department to acquire this land or any portion of it by negotiation. In fact, on page

3 of this proposal, it is stated that the Interior Department requests a specific amendment to permit the Secretary to acquire this land by condemnation proceedings and to pay the price of that condemnation. This means to me, that it leaves completely open ended the amount which the Government might have to pay for the property. Please bear in mind that as far as the owners are concerned, this land is simply not for sale. We, like most other businessmen, must borrow funds to purchase cattle, drill steam wells, construct generating plants, and in general to conduct our business on this ranch. The uncertainty of this pending legislation seriously impairs our ability to borrow funds for development.

Since the Interior Department's recommendation specifically requests a procedure of establishing a value by condemnation, it to me indicates that they must sense our feelings and anticipate that this procedure will be necessary.

I received an offer for  $2\frac{1}{2}$  times what I gave for this ranch less than 8 months after we acquired it. I was not sufficiently interested to even discuss the matter. On relating this offer to my partner Joe Harrell, engineer in charge of our geothermal project, he stated that as far as his 10 percent in the Baca Land & Cattle Co. was concerned, he would not take 20 times what he paid for his share. In short, he was saying there are just some things that are not for sale.

This committee may find it a little hard to understand, but the first time I knew of this bill was when someone sent me the clippings out of the newspaper. To this date, I have never been contacted in person or by letter by any member of the Interior Department or Parks Service suggesting that they discuss their project or this bill. This is not very conducive to cooperation or understanding.

On learning of this bill last summer, I came to Washington and visited with Senator Anderson and tried to see Senator Mechem, but he was out of town. While in Senator Mechem's office, a staff member of the Interior Committee, Mr. Verkler, was called in by Mr. Mechem's administrative assistant, and he talked with me briefly and gave me a map of the proposed new park.

During my visit with Senator Anderson, he assured me that he would notify me of any hearings. This he has done, and I appreciate it.

SENATOR ANDERSON. You have also gotten letters from me, have you not?

MR. DUNIGAN. Yes, sir; advising me of this. I had a wire advising me of this hearing and I had a letter from you concerning our conversation that day about the caldera, Senator.

We have heard the merits of this property from the standpoint of what the Interior Department and Park Service would like to see accomplished by their creation of this new national park. I would be the first to acknowledge that it is indeed a beautiful spot, but I would like to give my views on what we think is the higher and best use of this land.

First, as a cattle operation, I have previously stated that this ranch is one of the finest in New Mexico and has no equal for summer grazing between the first of May and the end of October. Bruce King, speaker of the house in New Mexico, and his brothers have the grass

lease through this summer. Starting next summer, we plan to stock this ranch with our own cattle.

During the summer grazing season of 1963, the King Bros. summered a total of 5,400 head of cattle on this ranch. To give you an example, by comparison, and I am quoting from the Santa Fe National Forest Service publication, they state that on 1,200,000 acres of forest and range land within the forest, they graze a total of 8,000 cattle and 4,000 sheep. From this comparison you can see that this has to be good grassland to run this concentration of cattle.

If I might, I would like to pass some of these publications up to you. This is a publication by the Atomic Energy Commission.

We have tremendous plans to further increase the potential of the ranch as a cattle operation. Working with the U.S. Department of Agriculture through their Soil Conservation Commission, we are presently conducting an experiment with 14 test plots of grasses to improve the quality and quantity of our pastures and to lengthen the grazing season by selection of early and late grasses. The ranch is also being surveyed for soil types and grass classification, with a view toward building optimum use of this land through range management.

Many additional test plots and soil fertility tests are scheduled for this summer. We are negotiating for the services of a consultant to assist us in our ultimate plan of range management, water and soil conservation. We have just acquired a D-8 Caterpillar bulldozer and have plans to correct erosion caused by years of bad timber practice, and also plan to build stock tanks and lakes to conserve the water resources of the ranch.

The 31 percent of the ranch covered by this bill contains approximately 50 percent of the grass meadows and grazing on the entire ranch. To take this substantial portion would not only take valuable grassland out of production, but would substantially affect the economic unit with which we are working. It is very true that the cattle business is presently depressed. I believe, as do many cattlemen, that this is temporary and, with the great growth potential of the country as a whole and the West in particular, we cannot afford to take this land out of production.

It is my understanding that the Park Service does not feel that a cattle operation is compatible with national park use, and does not permit the use of grass for grazing within the park areas.

Second, as a geothermal steam development, prior to purchasing the Baca location, we were barely aware of the existence of geothermal steam. During our investigation of the ranch, we read a report prepared for the prior owners by Val R. Reese & Associates, Inc., covering the geology and mineral resources of the Baca location No. 1. In this report, under a paragraph "steampower" was this summary statement:

Although steam may not be classified as a mineral, it is still a potentially valuable natural resource which could be of considerable economic importance and, in the author's opinion, should be considered as a potentially valuable asset in the same class as oil, gas, or metallic and nonmetallic minerals. Steampower has been utilized for power generation in Italy, New Zealand, and, to some extent, in the United States. In conjunction with an exploration program for the development of steampower, it is recommended that before such a project is undertaken, a study be made of available markets.

The report further goes on in final summary to say :

It does appear to the author that there is a distinct possibility for the development of a valuable source of steampower in the giant Valles Caldera. The scale of volcanism within the area is of such large magnitude that the occurrence of associated steam could represent a source of power that would be of economic importance. It is the author's belief that a potential source of power is always a valuable asset.

Our investigation also revealed that there were actual steam vents and fumeroles and hot spring activity over a very considerable area of the ranch. We also noted altered surface rocks and soils which established that the geothermal activity was quite widespread.

We followed this up with an investigation of steam development in the California area north of San Francisco, known as The Geysers, in which the Pacific Gas & Electric Co. is presently generating electricity from natural steam.

We also investigated the Salton Sea geothermal area and learned that plans were being made to harness this power for thermal development. Furthermore, our investigation revealed that a test hole drilled for oil in Alamo Canyon on the ranch had revealed substantial steam flows from a well drilled by West-States Oil Corp. in 1960.

Early last spring we made preparations to drill for steam on the Baca location.

I might add at this point that we own now 100 percent of the minerals in addition to the surface.

After leasing practically all of the fee land within the caldera and taking other leases for potassium sodium and oil and gas, we commenced a drilling program which lasted throughout the summer. We expended a total of \$436,808.89 on drilling, equipment, and leases.

Senator BIBLE. Might I ask a question at this point?

Is that expenditure all within the area proposed to be taken or was it elsewhere within Baca location No. 1?

Mr. DUNIGAN. The expenditure was outside of this area, but, as we will point out, the whole caldera itself, which contains lands not only on the Baca location but in the forest lands as well, is geothermally prospected. We drilled closest to the fumeroles that were actually coming out of the ground.

Senator BIBLE. But they were actually located beyond the exterior boundaries of this green area?

Mr. DUNIGAN. Yes, sir. They were located right in this immediate area here.

Senator BIBLE. At this point, if this had great value for geothermal steam and geothermal energy—and I am greatly interested in this, I have introduced a bill so that on public lands people who go in and develop thermal energies can be assured of a long-term lease. I am told that my State of Nevada has the greatest potential source of geothermal steam in the world. I don't know whether it is right or wrong, I am not an engineer, but 87 percent of our land is public domain and I think this has exciting possibilities.

But it still seems to me that if you were to create a national park that this in no way would run counter to your attempt to develop the balance of 75 or 80 percent or whatever it is for geothermal steam. Maybe you will answer that a little later.

Mr. DUNIGAN. I think I do, Senator.

The answer to that is that naturally we are prospecting initially in the most promising place where steam is coming out of the ground, but we feel the earliest volcanism, or by age the most recent volcanism, is in this area of 30,750 acres. The last eruption was within this area, and I think it is very potential throughout the 70 percent of this area that is included in the bill, but naturally we are going to spend our money first, and I cover where we plan to survey this area, too.

Senator BIBLE. All right.

Senator ANDERSON. If you will pause for just a second, you are connected with the oil business in the supplies that you do?

Mr. DUNIGAN. That is correct.

Senator ANDERSON. You say that you went into the most unlikely section and drilled there, first. You saved this other likely section for a later time.

Has it been your experience that the oil people drill where they think it is least likely to find oil and then go to other places later on?

Mr. DUNIGAN. Senator Anderson, I believe you misunderstood me. I didn't say that this was the most likely. I said it is the area of most recent volcanism. I think the most likely area is in the area where there are steam fumaroles and we know that the geology is very faulted, but that is the most likely area.

Senator ANDERSON. And Redondo Peak is the area between which you drilled and this area, isn't it?

Mr. DUNIGAN. No, Redondo Peak is within the area.

Senator ANDERSON. Within the area desired for the park?

Mr. DUNIGAN. Yes, sir; that is correct. But each of the rhyolite knobs that came up through the valle actually is a volcanic knob, and this is what they find in the Salton Sea. They find there are geothermals developed off of the edge of these rhyolite knobs which are present in the area under consideration.

Senator ANDERSON. You spent \$436,000 and did you get any property that produces geothermal steam?

Mr. DUNIGAN. Yes, sir; and I have a report here. Mr. Boren will give a report on the findings of our wells.

Senator ANDERSON. Go ahead.

Mr. DUNIGAN. Our development was successful and resulted in the establishment of a commercial steam reservoir. We think this amount of expenditure is substantial evidence of our confidence that we have potentially a very sound project in the recovery of natural steam, and in the ultimate generation of electricity to serve the communities and industry of New Mexico and other States connected to the Four Corners grid system.

This winter I visited the steam fields and generating facilities of both New Zealand and Italy studying the geothermal techniques of these countries that have pioneered the development of this very valuable resource.

We think the Baca location No. 1 holds the possibility of contributing substantially to the industry and employment of New Mexico. It is estimated that a 100-megawatt generating plant would cost in excess of \$10 million and would provide a great many jobs both in construction and in permanent employment. Our reservoir is not defined as yet, and the potential could be many, many times the 100 megawatt

which we would consider to be an economic unit and possibly the size of our first generating plant.

The Republic National Bank of Dallas, which has been a pioneer in oil, gas, and uranium financing, has shown a great deal of interest in our property and its potential. They have been very helpful to the extent that they have assigned one of their senior reservoir engineers to help us in the technical aspects of this study. I have asked this engineer, Mr. Kenneth L. Boren, to appear with me today and to read into this record some of the facts of geothermal steam, which he is more ably qualified to do than I.

Our immediate plans for the future exploration and development of this geothermal potential include a subsurface temperature survey of the entire ranch. It is our feeling that any area within this caldera and possibly some areas outside the caldera, are potential from the standpoint of geothermal energy. A very substantial portion, approximately 70 percent, of the acreage under consideration of this bill lies within the caldera.

The potential value to New Mexico of a source of inexpensive power so centrally located to the population center of the State cannot be disregarded, and I urge its preservation in private ownership, as this development is certainly not compatible with the conduct and operations of a national park.

As of this date a location is being made and a sight is being prepared to receive a rotary drilling rig for the start of our renewed exploration for steam on the ranch. We should be drilling by the 10th of June.

Senator BIBLE. Will that drilling be within the proposed taking area?

Mr. DUNIGAN. No, sir; we are again drilling back on the other side of the ranch where we tested our steam last summer.

Senator BIBLE. Roughly that is somewhere up north and west of the green area?

Mr. DUNIGAN. That is west-central.

Senator BIBLE. That would be west-central?

Mr. DUNIGAN. Yes, sir.

Senator BIBLE. Thank you.

Mr. DUNIGAN. The private funds being expended for drilling and research should be of particular interest to all members of the Interior and Insular Affairs Committee because of its immediate relationship to the great amount of Federal and public lands in areas of potential geothermal prospects. I might add, not the least of which is the forest lands immediately adjoining this ranch.

Third use is subdivision and recreation:

Our third and last use intended of this ranch concerns the possible development in the Dome Road area, which is within the area proposed by the park, of a subdivision to serve the seasonal and permanent housing and recreation requirements so much desired by many New Mexicans and by citizens of our neighboring States.

Our plans are too incomplete to give much details on this other than to say that it is something that will do credit to the beautiful surroundings in which it would be located. A great deal of planning will go into this effort before a blade of grass is turned over. The development will never smack of any of the land promotions which have given

so many projects a bad name. This development area falls within the acreage proposed by this bill, but we would never consider utilizing any portion of the Valle Grande exposure. This, I am sure, has been of great concern to those who cherish this beautiful vista. I hope this will set the record straight and serve to allay any concern on this point.

In conclusion, I would like to comment on the value of the lands covered under this bill and to suggest a possible method of preserving this land in private ownership but at the same time to accomplish the main objectives of this bill at considerable savings to the Government.

First, the Interior Department, in their recommendation, has indicated that they feel that \$950,000 would be the approximate cost to acquire this land. I do not know how this figure was arrived at, but it is considerably less than our actual cost of the land and improvements thereon. This would be true if you gave every acre of land on the ranch equal value, which is certainly not the case.

Senator ANDERSON. Right there, if you will pause for a second, you paid somewhere in the neighborhood of \$25 an acre?

Mr. DUNIGAN. That is correct.

Senator ANDERSON. 30,000 acres, that is \$750,000. Would that make this last statement right? Wouldn't \$950,000 be enough?

Mr. DUNIGAN. All right, sir, and I have a list of the improvements that we have on the place. We added \$216,000, I believe my statement showed this year.

Senator ANDERSON. That is \$2 an acre?

Mr. DUNIGAN. That is what? That would be \$7 an acre.

Senator ANDERSON. For 100,000 acres?

Mr. DUNIGAN. Well, no. Improvements are on this portion of the land, Senator. As a matter of fact, on this portion of the land there is \$301,000 of improvements which constitutes 88½ percent of the total improvements of the ranch, falling within this 30,000 acres, and this does not include any expenditure for geothermal. This is just improvements, fixed improvements on the ground.

Senator BIBLE. May I ask you a question? Do I understand that at the time you purchased this land you paid \$25 an acre for approximately 100,000 acres? Is that about right?

Mr. DUNIGAN. That is correct.

Senator BIBLE. There is no argument as to the correctness of the figure of about \$2½ million?

Mr. DUNIGAN. That is correct.

Senator BIBLE. That is included with it all of the improvement on the ranch at that time?

Mr. DUNIGAN. That is correct.

Senator BIBLE. I want to ask one further question. Did that include cattle as well?

Mr. DUNIGAN. No, sir, and did not include the timber, sir.

Senator BIBLE. It did not include the timber. The Senator from Idaho.

Senator JORDAN. Did it include the mineral rights?

Mr. DUNIGAN. Yes, sir.

Senator ANDERSON. Half the mineral rights, didn't it?

Mr. DUNIGAN. No, sir. The other half were brought in, Senator Anderson, before we purchased. That was a condition of our purchase.

Senator BIBLE. Just to resummarize, and this was in January 1963, just a little over a year ago?

Mr. DUNIGAN. Yes, sir, about 17 months ago.

Senator BIBLE. Seventeen months ago, the purchase price of this property was approximately \$2½ million for 100,000 acres?

Mr. DUNIGAN. That is correct.

Senator BIBLE. Which would make it approximately \$25 per acre. There was at that time how much in the way of improvements on Baca location No. 1?

Mr. DUNIGAN. On Baca location No. 1—

Senator BIBLE. Not now, but at that time.

Mr. DUNIGAN. I know, at that time there was attributable to the entire Baca location \$122,000 worth of improvements.

Senator BIBLE. \$122,000 on the entire location?

Mr. DUNIGAN. That is correct.

Senator BIBLE. And your testimony is that you put on \$250,000?

Mr. DUNIGAN. No, \$217,000.

Senator BIBLE. \$217,000?

Mr. DUNIGAN. Yes, sir.

Senator BIBLE. Since that time but on the area that is proposed to be taken?

Mr. DUNIGAN. That is correct.

Senator BIBLE. And your further statement is that of all of the improvements on Baca location No. 1, 80 percent are located within the taking area?

Mr. DUNIGAN. No, sir, 88½ percent.

Senator BIBLE. 88.5 percent?

Mr. DUNIGAN. Yes, sir.

Senator BIBLE. Thank you.

I just wanted to clear the picture.

Senator ANDERSON. Going back to the page 9 you said, "I received an offer of 2½ times what I gave for this ranch less than 8 months after I acquired it." This is \$6½ million?

Mr. DUNIGAN. That is correct, Senator, and I was not interested in it then, and I wouldn't be today.

Senator ANDERSON. Have you told the assessor that?

Mr. DUNIGAN. No, sir, but I am just telling what I know here today in connection with this bill, and I think it is indicative. It was a three-way land swap, and I was to receive that, of course, in cash. There was going to be some tax exchanges for lands.

Senator ANDERSON. You and I know it would be completely wrong to try to assess it on any such valuation because you have to be where cattlemen live and I recognize that. I wouldn't want to see it assessed in any such fashion as that.

Mr. DUNIGAN. Thank you, Senator, and I think, of course, this geothermal thing in California was just really coming to bloom at the time we came in here, and this highway has now been completed into the area. At that time there was no paved road into the area.

I will cover that here. There are 8 miles of pavement that now traverse this portion of land. It is the only pavement on the ranch.

There will soon be another portion across the southwest corner of our location, but it is not completed yet.

Viewed from a standpoint of cattle this land would have a value double that of the ranch as a whole, because of its excess of grassland, above average precipitation, abundant water, and proximity to the pavement.

Senator BIBLE. What is the average rainfall?

Mr. DUNIGAN. For the ranch as a whole it ranges from 25 to 36 inches. This is the area of highest precipitation in this portion of the ranch.

Senator BIBLE. Twenty-five inches of rainfall per year?

Mr. DUNIGAN. Twenty-five to thirty-six inches of precipitation.

Senator BIBLE. Thank you.

Senator SIMPSON. May I ask a question there?

What water rights do you have? Do you have all the priority of right?

Mr. DUNIGAN. Yes, sir, for use for livestock and agricultural use. We are limited in New Mexico for creation of any lakes beyond certain sizes. We headwater two rivers on this ranch, the San Antonio and the Jemez.

Senator SIMPSON. You don't need an awful lot of rainfall?

Mr. DUNIGAN. No, sir, we have an abundance of springs, also, on the ranch.

Viewed from a standpoint of value for recreation or homesites there is no way of estimating how many times more valuable this portion of the ranch is as compared to the portion not covered by this bill. This portion of the ranch is traversed by approximately 8 miles of new pavement, State Highway No. 4, completed in the fall of 1963.

Viewed from the standpoint of geothermal energy, it would be pure conjecture to establish a value. A great deal of exploration will be necessary before the value of the geothermal prospects of this area can be determined.

An example of values, at The Geysers, in California, there is presently being sold \$1,300,000 of electricity off of 2½ acres. There are eight or nine wells contained within 2½ surface acres, and to attempt to establish a value at this time, I think, would be out of keeping with any expert to say what the value could be of this area.

Senator SIMPSON. Suppose the Park Service would grant you rights to the minerals, would that have any influence on your attitude?

Mr. DUNIGAN. Well, sir, it would certainly make it more compatible. I would not like to see any portion of it taken, the valle, or from the standpoint of cattle and I wouldn't think the development of geothermal would be compatible with a national park.

Senator SIMPSON. Any more than the cattle would be?

Mr. DUNIGAN. That is right.

One very important point which is not covered by this bill or in the recommendations of the Interior Department letter is the value or ownership of the timber on this ranch.

I did not understand earlier that this \$950,000 purported to include the value of the timber, also.

Senator ANDERSON. It doesn't.

Senator ANDERSON. No.

Mr. DUNIGAN. Well, there is no mention—

Senator ANDERSON. You have 50 or 60 more years to cut timber. Timber is all around it. You have to set up a sawmill and deal with

them because they have the other timber up there. They weren't interested in it at all. We talked to the Forest Service about it at great length.

Mr. DUNIGAN. But there is a diversity of ownership in the timber.

Senator ANDERSON. I understand that, that you recognize that by going to court yourself recently, haven't you?

Mr. DUNIGAN. Yes, sir.

Senator ANDERSON. Trying to find out who owns it. The Forest Service couldn't care less.

Mr. DUNIGAN. We are litigating the matter of timber now. It is my understanding that the Forest Service and Park Service had plans to acquire this timber by an exchange of timber rights in other parts of the public domain. That was my understanding as to how the timber matter was to be handled. If timber rights are to be given up in exchange for the timber on this portion of the ranch it still amounts to a cost for this project.

Before any such exchange could be made it would be necessary to determine who owns this timber. Litigation is now pending in Federal court as to the ownership of this timber. The present owners of the Baca location No. 1 have brought suit to establish title to much of the timber involved in the area covered by this bill.

Based on a cruise made by consultants for the owners of the ranch we have determined that there are 9,890 acres of virgin timber for a total of 75 million board-feet with an estimated value of \$875,000.

Should the present landowners prevail in their suit they would have no interest in an exchange of timber as they are not in the timber business. Our only remedy would be in damages for the value of the timber taken by this bill.

Senator ANDERSON. Have you put in here the value of the timber in the particular area desired by the park or all?

Mr. DUNIGAN. No, sir. We have it for the whole location, Senator, and I asked that it be sent to me just for the area under consideration for this bill, and those are the figures that were submitted to me by wire yesterday, covering just this park area.

Senator BIBLE. Is that \$875,000?

Mr. DUNIGAN. Yes, sir.

Senator BIBLE. There are 9,890 acres of virgin timber totaling 75 million board-feet at an estimated value of \$875,000 just within the land owned by you and within the taking area?

Mr. DUNIGAN. That is correct, sir.

In exploring possible solutions that might accomplish the objectives of all parties, it was suggested to me that possibly some type of scenic easement might be arranged.

I am not well posted in what all is involved in an easement of this sort, but I would be agreeable to exploring this avenue if the Park Service and Interior Department cares to go into the matter.

Since most of the objectives of this park bill—namely, one, geology of the collapsed volcano; two, effect on surroundings geography; and, three, use by prehistoric people—are well demonstrated in the Bandelier National Monument and in the Santa Fe National Forest, it would appear that a scenic easement would accomplish a view of the caldera and the depression of the Valle Grande. In fact, an easement to the top of Mount Redondo would give a view of the entire caldera.

If this approach could be worked out it would save many millions of dollars in initial outlay and subsequent recurring cost, while at the same time permitting economic utilization of the ranch for the purposes outlined in this presentation.

My thanks to this committee for hearing our opposition to this bill and for considering the possible alternative solution proposed.

Senator BIBLE. Mr. Dunigan, that is a very splendid statement. You have presented your side of the case very forcefully and effectively.

When you say scenic easement, are you suggesting that there would be the possibility of working this out so that you could raise cattle and at the same time have a national park? Is that what you are suggesting?

Mr. DUNIGAN. I am suggesting that this caldera, the features of geography—there are no sheer embankments in which are shown the straight of a subsequent volcanic activity. None of this is exposed any place in the caldera. It is all covered with grass or timber and my suggestion is that, if possibly, an easement to the top of Mount Redondo could be obtained at the very minimum expenditure to the Government and Park Service. They already own land within just a very little distance of the top of Pajarito Mountain which overlooks the entire caldera. A scenic easement on top of Pajarito would give a view of the whole thing, and we would certainly cooperate and try to work that out.

Senator BIBLE. What you are suggesting, then, is you would simply give a scenic highway easement so that the people who would be coming on your property would simply be coming on for a view from the road. They wouldn't be able to come in and use the floor of the valley.

Mr. DUNIGAN. That is right. There is nothing in this valley except grass and meadow.

Senator BIBLE. On that point, as I understand it, about 5,400 cattle were grazed in the Baca location No. 1 by King brothers in the summer season of 1963. Of that number, how many were grazed within the taking area and how many were grazed on the balance, the 70 percent?

Mr. DUNIGAN. Just assuming that the grass was used equally, about 50 percent of the area lies within the area proposed by the park.

Senator BIBLE. And 50 percent lies?

Mr. DUNIGAN. In the other 70,000 acres. Is that correct, or 68,000? But you see, from looking at the pictures the AEC people prepared, that from Highway 4 you have a view of this entire expanse now. From the top of Pajarito, which can be approached from the Los Alamos County line, you have a view of the entire caldera. If they prefer a scenic easement from the top of Redondo, which would give them a view of the entire caldera, I know that something could be worked out along that line.

Senator BIBLE. As to your suggested proposal in attempting to work something out I just wanted to envision what you had in mind. I think I am very clear that your suggestion is limited to a scenic highway easement.

Would this include turnouts or areas where they could have a campground, camp areas and sites, and things of that kind?

Mr. DUNIGAN. Well, I think that is something that would need to be explored to see what the results of the easement would be. I have just heard of this scenic easement and it was suggested as a possible satisfactory solution. It would give the Park Service what they want and save them the cost of acquiring this land and the timber.

Senator BIBLE. I am not sure it gives the Park Service what they want, because what they want is 30,000 acres in fee simple to put together with Bandelier National Monument to make a complete national park that has no adverse use. That would embrace about 60,000 acres, so that isn't quite saying the same thing as you are.

Mr. DUNIGAN. I didn't mean to state it that way. I meant it would accomplish the objectives as set out as to the viewing of the geology and geography. That is what I meant to say.

Senator BIBLE. I just wanted to be sure that the record completely makes your position abundantly clear.

Senator ANDERSON. Do you have any comment on this wire that Mr. Savage sent here, that the mortgage people wouldn't be agreeable to releasing that portion of it even on the payment of \$950,000?

Mr. DUNIGAN. Yes, sir. I have talked with Mr. Savage about it and he feels as I do that by far the bulk of the value of this ranch lies within this area, and I think I have pointed out the reasons I think that is so, Senator Anderson.

Senator ANDERSON. Most of the timber is outside this area.

Mr. DUNIGAN. You see, we don't own the timber rights until it is litigated that we do, but there is a sufficient amount of timber—9,800 acres of virgin timberland constitutes, according to our cruisers, a substantial value.

Senator ANDERSON. Do they think it is big enough to cut?

Mr. DUNIGAN. Yes, sir; it is virgin timber of merchantable size. These are timber consultants with very substantial reputation. We are using them in connection with our litigation at the present time with the New Mexican Timber Co., Senator.

Senator ANDERSON. Isn't it strange that nobody ever tried to cut it in the last 20 years?

Mr. DUNIGAN. They have cut in this area.

Senator ANDERSON. Involving this piece?

Mr. DUNIGAN. Yes, sir. I have a map showing the cutover areas. They have cut right in. This area all along in here is cutover pine.

Senator BIBLE. For the record, the witness is showing the Chair and members of the subcommittee a map entitled "Land Classification Map, Baca Location No. 1, prepared for the Baca Land & Cattle Co., by Frank & Dean Solinski, Inc., of San Francisco, Calif."

This map will be made a part of the files, and will be referred to as an exhibit, whatever the next number is in the line of exhibits that have been introduced.

Now, by reference to this map the witness can point and indicate what the legend represents.

Mr. DUNIGAN. This area here is cutover—

Senator BIBLE. By "this area here" he is referring to the area in pink. The witness is referring to the area in pink.

Now, that represents what?

Mr. DUNIGAN. This represents cutover pine, the stated area in pink. It is cutover pine in here.

Senator BIBLE. The pink on the map represents cutover pine?

Mr. DUNIGAN. This fuchsia, I guess you would call it.

Senator BIBLE. Fuchsia or purple?

Mr. DUNIGAN. Is cutover mixed?

Senator BIBLE. When was the first area cut over?

Mr. DUNIGAN. The first area cut on the ranch was in 1937, it is my understanding, Senator, and they have been cutting over the ranch as a whole throughout that time. They have selectively cut different areas. Some of the largest stands remaining of uncut virgin timber are in the Dome Road area and along the approaches to Mount Redondo.

Senator SIMPSON. Is the witness talking about cutover in the taking area in referring to this map?

Mr. DUNIGAN. Yes, sir.

To answer Senator Anderson's question, had they ever cut in this area?

Senator BIBLE. Further questions on the map as to cutting over of timber?

Thank you, Mr. Dunigan.

Further questions of Mr. Dunigan?

Senator Anderson?

Senator ANDERSON. All they would have is a chance to look but no chance to develop. Who in the Park Service indicated that might be satisfactory?

Mr. DUNIGAN. No one in the Park Service indicated it to me, Senator, that this might be a possibility. I didn't say that. I stated that it had been suggested to me that this was a possible approach that might tend to serve both purposes. I would rather not have that, and I am sure that the Park Service would like to have it all.

I just thought that this might constitute a compromise which would both save money and accomplish many of the objectives, if not all, of the Park Service.

Senator ANDERSON. You want a road that leads up to the ranch, the old ranch—

Mr. DUNIGAN. I know where it is, Senator. I think the old trail that is now becoming a highway goes around and it comes up to that ranch.

Senator ANDERSON. I think so, too.

Now, you wouldn't have ever tried to come down that road, would you? I tried it once or twice and every time you go a few feet you run into a cattle guard, a gate, and the gates are padlocked and you turn around and go back 50 miles. Is that what it would consist of?

Mr. DUNIGAN. If there is a scenic easement I imagine it would be of sufficient width and probably it would be fenced by the Park Service.

Senator ANDERSON. An easement to Mount Vernon doesn't allow getting to the other side.

I just don't understand how you could get anything out of that. There would be cattle on the ranch.

Mr. DUNIGAN. The cattle couldn't cross the easement if the easement was fenced up to, say, the top of Mount Redondo to Obesta Point or to Pajarito. There would be room on top of Pajarito for a picnic area or whatever was requested up on top.

Senator ANDERSON. You would have to move your cattle out of there anyhow in the wintertime, wouldn't you?

Mr. DUNIGAN. Yes, sir, that is correct. And we are working on plans whereby we may cut enough hay up there that we may winter at the ranch, but certainly if it is done it will be done in close quarters. That part of it wouldn't interfere with the operations.

Senator ANDERSON. Can you tell us where this suggestion came from on this scenic easement?

Mr. DUNIGAN. Yes, sir; Congressman Walter Rogers suggested that possibly a scenic easement would be something that could be worked out.

Senator ANDERSON. All right.

Senator BIBLE. The Senator from Idaho, Senator Jordan?

Senator JORDAN. Mr. Dunigan, you have made a very fine statement here. It is a very fascinating country, of the kind I like.

I might suggest to the chairman we are going to have to have a look at this before I can resolve any doubts that I may have.

Mr. DUNIGAN. I would like to extend an invitation to all the Senators to visit the ranch.

Senator BIBLE. Perhaps we might spend the next 3 weeks there.

Senator JORDAN. It looks like Mr. Dunigan needs another partner here, and I would like to apply.

Speaking now about your cattle operations, Mr. Dunigan, and that has been my business, you talk about grazing 400 cattle for 6 months in the whole operation.

Mr. DUNIGAN. That is correct.

Senator JORDAN. About half of them are grazed in this taking area?

Mr. DUNIGAN. That is correct.

Senator JORDAN. Or about 16,000 animal-months in this taking area.

It would be approximately that. Was the forage food fully utilized?

Mr. DUNIGAN. The grass has never been fully utilized on this ranch. For one thing, there are tremendous sections of it. Most of the cross fences are in the particular area we are talking about. There is one pasture on the ranch that contains 43,000 acres without a drift fence, and naturally the cattle, you find most of them with one foot in the river. We think that by location of some stock, some water tanks along some of the draws in the higher elevations, that we can utilize a very great deal more of the grass than is presently being used.

I rode through grass last summer in the slopes that cattle never got to that was belly high to the horse.

Senator JORDAN. What I was trying to do was establish in my mind what it might be worth strictly as a cattle operation, a summer range for cattle, because that is the way we operate. Good summer grazing for 16,000 animal-months would be worth about \$50,000 as a rule of thumb, looking at it strictly from a cattle operation. I wonder if that is approximately correct.

Mr. DUNIGAN. I have never figured it on that basis. With our grass program and with cross fencing, we hope to be able to handle up to 7,500 steers for a 6 months' period of time, if we decide to go the steer route, or 5,000 mother cows. We think we can do this and never damage the range.

Senator JORDAN. I reserve the right to look it over, Mr. Chairman.

Senator BIBLE. You had better take out a reservation.

The Senator from Wyoming, Senator Simpson.

Senator SIMPSON. I just want to clarify something, Mr. Dunigan. On page 5 of your report you say that during the past summer you expended \$217,000 plus on this portion. What is the nature of those expenditures?

Mr. DUNIGAN. They were for corrals, for houses, for homes. By houses, I mean we built some A-frames, we built an eight-bedroom lodge.

Senator SIMPSON. You have room enough to take care of the committee.

Mr. DUNIGAN. Yes, sir.

I would like to pass this up, if I might.

Senator SIMPSON. I think we saw it.

Senator BIBLE. You showed us that picture, but is this in being or is this an artist's concept?

Mr. DUNIGAN. It is completed now.

Senator BIBLE. It is completed now?

Mr. DUNIGAN. Yes, sir.

Senator SIMPSON. Those, then, are expenditures on the taking area?

Mr. DUNIGAN. That is correct, sir.

Senator SIMPSON. Now, I think Senator Anderson cleared this up. These 125 people, you don't want to leave the inference they are employed there, do you?

Mr. DUNIGAN. No, sir.

Senator SIMPSON. How many do you employ?

Mr. DUNIGAN. What do we employ there? We have two men who are working for us on the ranch. But you see we don't get the grass until after the season, Senator Simpson. At that time we will have probably five cowboys and a superintendent, a manager.

Senator SIMPSON. You heard the testimony of Mr. Fredine with respect to taxes. Is that what you pay in taxes?

Mr. DUNIGAN. No, sir. It is my understanding that the taxes are \$6,000 a year. They are being paid by Mr. Savage at this time because we do not have the grazing rights. He was the former owner and he agreed to pay the taxes during the period of time that the grass was under lease to the King brothers.

But we will commence paying the taxes on January 1, 1965. But the \$6,000 is my understanding as to the taxes.

Senator SIMPSON. With respect to your statement on page 9 about never having been contacted by the Park Service with respect to the acquisition of this property, how did you happen to know about the prospects?

Mr. DUNIGAN. From the bill that was introduced, Senator.

Senator SIMPSON. Was that the occasion of your visit to Senator Anderson?

Mr. DUNIGAN. That is correct.

Senator SIMPSON. On this cattle grazing in this area, you say 50 percent of the grazing is on this taking area. Has any of this been overgrazed at all with the 5,400 head of cattle in the area?

Mr. DUNIGAN. I would say that it has not been overgrazed. I think that it ought to be fenced without increasing any more cattle than that. I think that the total land should be better utilized. Most of

the concentration has been in there, but there is complete cover, complete turf all over the valley, as you can see from these pictures.

Senator SIMPSON. How big is this caldera?

Mr. DUNIGAN. The caldera consists of 180 square miles of which 85,000 acres is within the ranch, and the rest is in the Forest Service.

Senator SIMPSON. Your acquisition cost with \$25 an acre?

Mr. DUNIGAN. Yes, sir.

Senator SIMPSON. All right.

Senator BIBLE. Any further questions of Mr. Dunigan?

Mr. BOREN. Senator, could I answer one question that was asked of one of the park department? They were asked if we were completely surrounded by national forests, if there was any private ownership. I wish to state that there are approximately 3,000 acres owned within the caldera by fee ownership, private ownership.

Senator BIBLE. But other than that 3,000 acres, you are surrounded by the Santa Fe National Forest and Atomic Energy Commission, would that be correct?

Mr. BOREN. And the Santa Clara Indians. I don't know whether it has been received by the committee or not, but I think that it will be received. I got my copy at noon today, in which the taxing authority of Sandoval County broke down the land.

Senator BIBLE. That was received by me during the noon hour. I previously referred to it and have made it a part of the record. I am sure we refer to the same thing.

Mr. BOREN. I think there is 723,000 acres of fee land in the entire county of which 100,000 of it is ours, the Baca location.

Senator BIBLE. I will be very happy to look at your letter, but I am sure it is exactly the same letter that I have put in the record. The clerk will compare it and if there are any differences we will correct it for the record. I think yours is simply a copy.

Mr. BOREN. I think it is. I didn't understand that is one of the things you had received.

Senator BIBLE. I received it during the noon hour and at the start of the hearing I introduced it as part of this record.

Senator SIMPSON. Mr. Chairman, may I inquire? There is something in my mind here that I can't quite visualize. What happened to this little neck of land that extends between the taking area and the Bandelier National Monument? That on my map says belongs to the Atomic Energy Commission.

Senator ANDERSON. It has been declared surplus by Atomic Energy Commission to be added to the park.

Senator SIMPSON. Is it now a part of Bandelier?

Senator ANDERSON. That is right.

Senator BIBLE. I understand that it is now a part of Bandelier. Senator Anderson makes this statement, and I think it is correct.

Senator ANDERSON. In the early days of the atomic energy work they went off into far off areas to test small explosives, and sometimes very large ones, and these places were as far away from Los Alamos as they could get. Some of the areas were in this general neighborhood.

Now, they don't need it because we have an underground testing treaty.

Senator SIMPSON. It sort of makes a corridor between the proposed taking area and the national monument.

Senator ANDERSON. That is the way it got to the Atomic Energy Commission. They went around and took up all the land they could get to protect what they thought they might need for testing.

Senator BIBLE. Further questions of Mr. Dunigan?

Mr. Boren, we will incorporate your statement in full in the record, and I would appreciate it if you would just hit the high points of your statement.

You are going to testify, as I understand it, about geothermal steam.

Senator SIMPSON. Mr. Chairman, will you have the witness qualify himself?

I only see one statement with respect to who he is or what he is. I would like to know his qualifications.

Senator BIBLE. Please qualify yourself, Mr. Boren, by telling us your educational background, your experience in this field, whether you are a licensed engineer, and so forth.

#### STATEMENT OF K. L. BOREN, PETROLEUM ENGINEER

Mr. BOREN. Mr. Chairman and gentlemen, I am K. L. Boren, a petroleum engineer with the Petroleum National Bank of Dallas. I am a registered engineer in the State of Texas. I have done reservoir engineering work in the oilfields and gasfields for 15 years.

Senator BIBLE. I come from Nevada where we only have one poor old leaky oil well. Tell me what a reservoir engineer is.

Mr. BOREN. I understand your State is getting some activity now.

Senator BIBLE. We hope that is right.

Mr. BOREN. We hope you get something. A reservoir engineer is merely a petroleum engineer who is concerned primarily with what is going on underground, what is happening in the rocks, what the reserves are and what the performance is liable to be of the oil reservoir.

Senator ANDERSON. For the purpose of making loans through the national bank, they want to estimate the capacity?

Mr. BOREN. That is right, sir. We evaluate properties merely for loan purposes for ourselves.

Senator SIMPSON. Where were you educated?

Mr. BOREN. I was educated at the University of Texas, got out with a petroleum engineering degree in 1949, worked for Gulf Oil Corp. for about 5 years prior to going with the bank, and have been with the bank about 11½ years.

Senator SIMPSON. What professional societies?

Mr. BOREN. AIME, the American Institute of Mining & Metallurgical Engineers.

Senator BIBLE. Are you satisfied with the qualifications?

You may proceed, Mr. Boren.

Mr. BOREN. Thank you, sir.

I would like to preface my remarks with the statement that our bank nor do I have no monetary interest in this field of endeavor of Mr. Dunigan's here. We became interested in geothermal steam in the same more or less general manner that we became interested in oil and gas loaning. We consider it a possibility of new vehicles for

financing and we wanted to get in on the ground floor knowing what was going on.

So about a year ago or a little over when Mr. Dunigan acquired his ranch and it happened that this ranch has a sizable geothermal steam prospect, I was assigned to study geothermal steam.

So for about a year I have spent a lot of time in studying and research and in going to California and going to Mr. Dunigan's ranch and learning what I could about it. We are happy to give you gentlemen the benefit of what I can on what has gone on in Mr. Dunigan's ranch.

The Baca location No. 1 has been a significant factor in the local cattle industry of New Mexico, and under the intense development now underway, it should certainly grow in this respect and even add considerable stature to the area as the rich soil is put under cultivation. Now it appears an even greater contribution to the area might be available from a newly recognized energy source underlying the ranch. The energy source is geothermal steam, and it will be used primarily for the generation of electricity.

Geothermal steam is steam that comes from the earth, and is sometimes called natural or underground steam. It is associated with volcanic activity, being a product of the intense heat and gases given off by the hot magma known to be present at depth, and the water contained in the thousands of feet of porous rock overlying the magma. Often, this steam rises to the surface through fissures and forms such surface phenomena as steam vents, fumeroles, and geysers. Such surface indications of geothermal steam are apparent at Yellowstone National Park, where some 3,000 hot springs, steam vents, and geysers attest to the near-surface heat source. At the more recently formed Katmai National Monument in Alaska, the surfacing geothermal steam is in a spectacular valley known as the Valley of Ten Thousand Smokes. In other areas, such as on the Baca Ranch, the geothermal steam is seen at the surface only in a few widely scattered hot springs and some mildly active steam vents.

To utilize the tremendous amounts of heat energy stored underground, wells are drilled to the steam-productive rocks, at depths varying from less than 1,000 feet to more than 8,000 feet, and completed as steam wells in much the same general way other natural gas wells are completed. The steam is induced into a powerplant built on the site, which utilizes a turbine-generator arrangement to convert the heat contained in the steam to electricity. In this manner the most likely geothermal steam prospects around the world are being developed to supply much needed power. Already New Zealand is supplying about 25 percent of its more populous area, North Island, with power from geothermal steam. Italy's geothermal steam complex supplies about 4 percent of that country's total electrical power. Japan, Iceland, and Mexico have small plants in operation and Russia is said to be developing a geothermal steam source. In the United States, the only operating geothermal steam project to date is about 95 miles north of San Francisco, at The Geysers, where Pacific Gas & Electric Co. operates a plant having a rated capacity of 27,500 kilowatts, or enough to supply a city of about 20,000. Several prospects in this country have been tested already, and exploration activity is increasing rapidly, mostly in the mountain and pacific regions where

volcanic activity has been concentrated. Through 1962, 58 wells had been drilled in California in search of geothermal steam on 15 separate prospects.

The search to date has been concentrated in the Western States where volcanic activity and surface indications such as hot springs are more abundant. The geothermal steam industry in this country is certainly in its infancy and might best be compared to the oil industry in the early part of this century when most prospects were drilled on the basis of oil seepages at the surface. It is arriving at an opportune time, however, and at an opportune place. The Federal Power Commission has estimated that the demand for electrical energy in the United States would double in the decade from 1960 to 1970, and increase  $3\frac{1}{2}$  times in the 20-year period ending in 1980. They further show that the Western States will grow in electrical demand 16 percent faster than the country as a whole in this 20-year period. Nor can hydroelectric power alone supply this increased demand from the Western States. The Federal Power Commission estimates that only 27 percent of the power requirements of these States will be met by hydro plants in 1980. In fact, it was recently pointed out in a paper from the U.S. Bureau of Mines that the primary burden will fall on fuel-generated plants. The USBM figures indicated that fuel-generated output in the Western States would have to increase more than six times by 1980, and that additional sources of energy were clearly needed in the years to come.

Certainly geothermal steam fills the bill as an additional source of energy. In the USBM paper entitled "An Economic Appraisal of Geothermal Power," the statement is made, in reference to the added capacity that will be needed in the Western States, that :

A portion of this additional capacity appears to be available through the use of geothermal steam for generating electric energy. Preliminary data indicate that substantial quantities of steam may be available in the Western States at a reasonable cost. Investigation of electric power costs at currently operating geothermal units and calculation of hypothetical costs for fossil fuels in the Western United States indicates that geothermal power can be produced competitively in those States.

Senator BIBLE. At that point, Mr. Boren, what is the cost per kilowatt-hour at the 28,000-kilowatt plant that Pacific Gas & Electronic operates?

Mr. BOREN. It is somewhat broken up, Mr. Chairman, because Pacific Gas & Electric operates the plant and they buy the steam from another company, Magma & Thermal Power Co. They pay  $2\frac{1}{2}$  mills for net kilowatt-hours produced for the steam, and their operating costs then of the plant are over and above that.

Senator BIBLE. Is it a dependable source of power or is that 27,000 kilowatts at 100 percent load factor?

Mr. BOREN. So far they think so. There is not so far any definite way as there is in oil and gas of putting your finger on exactly what the reserves are in geothermal steam.

In Italy where they have been doing it for 30 years, while the well might conk out they will drill another one and the reservoir will keep on going. It has not played out and they don't anticipate a future life in this.

Senator BIBLE. Is that all that Pacific Gas & Electric pays the Magna Corp, 2½ mills per kilowatt-hour? Do they pay any additional kilowatt charge for capacity?

Mr. BOREN. Not for the steam.

Senator BIBLE. That is all they pay?

Mr. BOREN. That is right, 2½ mills.

Senator BIBLE. Without any relationship to a kilowatt charge?

Mr. DUNIGAN. Senator, I might answer in that one of the Pacific Gas men told me it was the cheapest electricity they had on their system even though they had some 300,000-kilowatt plants, that this small unit, as inefficient as it is from the standpoint of size, was the cheapest power that they were producing.

Senator BIBLE. I think this is an area that certainly has to be explored and explored thoroughly and it does offer some hope of additional energy. Nuclear power offers another source of energy to supplement hydro and natural gas sources.

Of course, I still fail to see, even if this is everything that you assume it might be in a geothermal area, why you still couldn't develop a fine geothermal steamplant outside of the confines of this proposed tag area. I don't quite understand that but then that is a matter that we can resolve as we go along.

Mr. BOREN. Along those lines I would like to point out that in the geothermal steam there are only a few geothermal steamplants in the world today. In the ones that have been the most developed, Larderello in Italy and Wyracke in New Zealand, you find it in a complex, Senator, not just in one plant and a few wells here. For instance, Larderello covers an area that is somewhat equivalent to the whole Baca location here. They will have a group of wells and a plant here, a group of wells and a plant there, and that is somewhat akin to an oil and gas location where you might have a good area at one point but it might extend over a larger area.

Senator BIBLE. I understand your point there.

If this is good for private industry maybe this would be wonderful for the National Park Service. Maybe they could develop a geothermal steamplant right within the taking area and let people from all over the world come and see one in operation and at the same time they could use it to supply themselves with the cheapest power in the world, 2½ mills or whatever it is, and run the operation.

Maybe Uncle Sam would be operating a national park at a cost far less than he would if he had to go to a private utility to get the power. That might be a way of getting this worked out.

Mr. BOREN. I would personally think that private development of the lands now in private hands would be a lot better than the Government taking them over in order to develop a geothermal steam prospect. Of course, the Government could do it.

Senator BIBLE. I am not suggesting that the Federal Government develop it anywhere except within their own area. Maybe you and your client could develop it on the 70-percent part of the Baca location No. 1, and the National Park Service could develop it on the 30,000 acres that are within the taking area, just as a suggestion.

Mr. DUNIGAN. The problem would be, I think, arriving at any fair value prior to development work on it, Senator.

Senator BIBLE. I am sure you are going to have to go many years in the future before you are able to develop fair value on geothermal steam.

I have a better than a fair-working knowledge of that and I have worked to have Pacific Gas & Electric, Magma Power, and all the rest of the people in this area attempt to arrive at values. This is the very thing that is making progress so slow on a bill which we have before us to permit private enterprise to come on public domain and capture this geothermal steam.

That is the very problem that we have to try to develop—a fair value for the geothermal steam, because it is a new science.

Mr. BOREN. Along the lines there and what you can depend on, are you aware of the fact that at The Geysers the Northwestern Mutual of Wisconsin has loaned \$1,200,000 strictly on a steam payment very similar to an oil and gas payment in which there is a no recourse and a payout of 10 years? They get a third of the value of what Magma receives from Pacific Gas & Electric. They depend on the steam alone. They have loaned \$1.2 million on it, not that they can pin down reserves, but they pin down in their own mind that there are sufficient reserves to make that sort of an investment on an interest basis.

Senator BIBLE. On a 10-year loan you say?

Mr. BOREN. Right.

Senator ANDERSON. You wouldn't regard that as necessary proof as to its value, would you? Some men made some big loans on vegetable oil last summer, on ammonium sulphate down in Texas. You have heard of that, haven't you?

Mr. BOREN. I have heard of that.

Senator BIBLE. You may proceed, Mr. Boren.

Mr. BOREN. Just how much geothermal steam will be available to supplement conventional energy sources is, of course, not known; however, it must be recognized that the prospects are limited. For this reason each project becomes the more important to the local area to be served by its potential energy, and conversely, each project precluded from development takes away immeasurably from the growth and prosperity of the local area, and limits the country as a whole in the use of a new and virtually untapped energy source.

The Baca's geothermal steam potential is well located to serve one of the fastest growing areas in the Nation. The Bureau of Census estimates that New Mexico's population will increase by 36.9 percent in the decade from 1960 to 1970, compared to 19.1 percent for the country as a whole. Only 5 States exceed this growth rate, and it is interesting to note that 1 of these is the adjacent State of Arizona, whose growth rate is estimated to be 54.4 percent, the highest rate in the land.

Senator BIBLE. The greatest estimated growth of them all is in Nevada, as the Bureau of the Census survey will bear out.

Mr. BOREN. If it can be assumed that power requirements approximately parallel population growth, then it can be said that this area's power needs are growing about twice as fast as the country as a whole, and would therefore be doubling every 5 years. This is borne out by Federal Power Commission statistics which show that the installed capacity of all electric utilities in New Mexico increased from 280,900 to 802,000 kilowatts from 1950 to 1960, which is nearly tripling in a

10-year period. Since 97 percent of New Mexico's power is derived from the burning of natural gas, it is readily seen that if the tremendous increase in that State's power requirements are also to be fueled mostly with natural gas, there must be a commensurate increase in gas burned as boiler fuel. The Federal Power Commission has labeled this an "inferior" use of a valuable natural resource, and while they haven't outlawed the use of gas as boiler fuel, it is clear they would welcome a new energy source such as geothermal steam as a means of reserving more of our gas supply for other uses. From all this it is certainly reasonable to conclude that:

- (1) New Mexico's growth rate is nearly double that of the Nation.
- (2) The support of such an expansion is dependent on an adequate power supply, which must require a vast expansion of power generating facilities in the future.
- (3) If a geothermal steam power source is available in the State, its development is of vital concern to the immediate area to be served by its power; but even beyond that it is of much importance to the State and even the country as a whole.
- (4) The development of a geothermal steam power source in New Mexico would tap a new energy supply, and would thereby both add to our total energy resources and conserve another valuable resource, natural gas from fossil fuel reserves.

Now, what of the prospects for developing a significant geothermal steam power source on the Baca location No. 1? While ultimate success of the project and its magnitude cannot be known conclusively at this time, preliminary investigations to date show favorable results. These investigations have been along the following lines:

- (1) General volcanic geology;
- (2) Surface indications;
- (3) Geochemical considerations;
- (4) Exploratory drilling.

These will be discussed briefly as follows:

#### GENERAL VOLCANIC GEOLOGY

Volcanic activity is common to all geothermal steam prospects, and since the heat source to be produced as steam is the same magma that caused the volcanism, it can be theorized that the greater and more prolonged the volcanic activity, the greater is the available heat supply. The Valles Caldera in which the Baca Ranch is located is not only one of the largest calderas in the world, but its major volcanic activity is said to have culminated in the greatest explosion in the earth's history. Geologists with the U.S. Geological Survey have indicated the volcanic eruptions within the caldera began approximately 3 million years ago and continued until as recently as 50,000 years ago. The scope of this volcanism is further accentuated by the fact that an earlier caldera, now mostly covered by flows from the Valles Caldera, is present just beyond the northeast rim of the Valles Caldera.

If I could show that you, in addition to the Valles Caldera there is a long streak of volcanism and earthquake activity going through New Mexico. Right in here we are told by the USGS man that there is an undercover caldera, smaller than this but a caldera formed by the same manner.

Within the Valles Caldera rim at least nine separate volcanoes can be seen today as mountains protruding from the caldera floor.

Senator SIMPSON. May I suggest that you specify it by telling which map you are referring to so that the reporter will get it in the record?

Mr. BOREN. I am sorry. I am referring to the proposed Valle Grande-Bandelier National Park, and this I assume is the north direction up here. This is the rim of the Valles Caldera. The old caldera is up here.

Senator BIBLE. You are pointing to the northeast section. That won't show in the reporter's record. The northeast section of the Baca location.

Mr. BOREN. Right, just over the rim from the northeast part of the Valles Caldera.

Now this was not caused, the volcanism was not caused by one volcano or the exploration of one volcano. It was a series of explosions that took place from maybe 3 million years ago to 50,000 years ago. Possibly the center and the most explosive part occurred in the west-central part of the Valles Caldera. But since then there have been volcanoes less explosive that have come up, at least nine such peaks which are seen as mountains today, started probably up in here, and you can see them along in here. These are the mountains starting from the west, going around in a clockwise manner until you get down here to the El Cajete crater which was mentioned a while ago.

Now I wanted to show you that to indicate the amount of volcanism and the distribution of it. It wasn't all in one central place.

These are distributed fairly uniformly around the caldera, indicating the hot magma actually surfaced through craters in nearly every part of the caldera. It is interesting to note that the most recent volcano, probably only 50,000 years old, is in the south part of the caldera.

And it would be probably a half mile south of Redondo Peak and would be within the proposed park area.

This is almost due south of Redondo Peak and is the crater known as El Cajete. Redondo Peak itself is not a volcano, but is the result of doming caused by the pressure of expanding magma underground. The proximity of these two features suggests that the area between might have a near-surface heat source that would warrant exploratory drilling for geothermal steam. Of course, because of the obvious size of the basic magma body known to be present and the widespread area over which it has been evidenced on the surface, it doesn't appear any part of the caldera can be condemned at this time. It can only be inferred from the volcanic geology that the conditions are such as to indicate a geothermal steam prospect of some magnitude.

#### SURFACE INDICATIONS

Surfacing steam and hot springs are found at widely scattered points around the caldera. The most concentrated steam vents are along the west edge of the Baca Ranch, in an area known as Sulfur Springs, but other steam vents are found on the northwest slope of Redondo Peak, in a remote area along Redondo Creek. While not spectacular as are the steam vents of Yellowstone or Katmai, they are nevertheless indicative of a near-surface heat source sufficiently hot to produce geothermal steam.

The hot springs are found primarily along the west rim of the caldera and extend somewhat into the north rim and the south rim. These are springs of ground water that have been heated by the underground steam and hot rocks below.

The caldera has a relatively large "altered" area in the general area just northwest of Redondo Peak. It is so called because the surface area has been discolored by the sulfuric acid formed by the sulfur gas escaping from the hot magma below.

Such surface indications are not in themselves evidence that geothermal steam can be produced in commercial quantities, but they are certainly conclusive evidence that the magma body at depth is still an active heat producer. Similar surface indications are to be found at producing geothermal steam projects such as at Larderello, Italy, and at The Geysers in California.

#### GEOCHEMICAL CONSIDERATIONS

In a paper entitled "Preliminary Evaluation of Geothermal Areas by Geochemistry, Geology, and Shallow Drilling," Dr. Donald E. White, of the U.S. Geological Survey, has suggested some means by which a geothermal area can be investigated and evaluated in a preliminary way prior to drilling. His method is to analyze the waters of the hot springs for acidity, chlorides, and discharge rate. In brief, he has found that if the springs show to be strongly acid, low in chlorides, and have a low discharge rate, the area will produce primarily dry steam. On the other hand, if the hot springs waters are alkaline, high in chlorides, sulfates, and bicarbonates, and have a high discharge rate, the area will produce primarily hot water. In applying this test to hot springs from this caldera, the results showed very conclusively that the area should be considered productive of dry steam.

#### EXPLORATORY DRILLING

The Baca Ranch has had three wells drilled to depths sufficient to encounter abnormal temperatures and geothermal steam flows. All three were in the "altered" area northwest of Redondo Peak. The first well was drilled in search of oil in the summer of 1960. Westates Petroleum Co. drilled to a total depth of 3,675 feet before continued flows of steam forced abandonment of the well. No steam flow tests were made, but the driller later reported that the steam blew the mud from the hole and appeared to be dry steam.

The Baca Land & Cattle Co. drilled two exploratory wells for steam in 1963. The first encountered a sloughing problem that forced abandonment at a total depth of 2,560 feet. During drilling operations the well was flowing steam continuously from a depth somewhat less than 1,000 feet to total depth. Attached is a copy of the summary page of a flow test made of this well by Rogers Engineering Co., Inc., in San Francisco. They are competent engineers as regards geothermal steam and have done most of the geothermal steam testing that I know about out in California.

The test attached to the back of your page or the summary page of their test shows that at 1,300 to 1,500 feet they tested about 85,000 pounds of steam per hour, and that is fairly comparable with wells in The Geysers in California.

I would like to point out that after drilling that 1,500 feet, which is the deepest they tested it, the steam flow increased considerably, and we feel that the well was capable of considerably more than that 85,000 pounds per hour.

Rogers did test the fluid and found that it was nontoxic. There are no deleterious elements contained in the fluid.

The second steam test drilled in 1963 was taken to the granite to test temperatures and flows at depth. Temperatures up to 500° F. were obtained, indicating adequate heat was present. Steam flows were encountered during the drilling of this well but the well was not completed as a steam producer last year, and further efforts to establish adequate flows are planned for this summer.

In that regard since that well was drilled, they took all their equipment off. They didn't have sufficient equipment to test the well, and since then we have discovered that there are ways of making these wells produce, which we didn't know before. Geothermal steam production is a very new science.

The results of all three wells drilled to date indicate positive results as to the availability of a geothermal steam source within the caldera. Additional testing is planned for this summer. In addition to further testing of the deep steam test just mentioned, a geothermal survey is being planned in the caldera as an exploration tool. This survey consists of a series of temperature measurements at a depth of about 10 feet. It is hoped that such a survey will locate the areas of highest underground heat within the caldera. Other geothermal steam prospectors in California are using this method to evaluate prospects and choose favorable locations for well sites. Immediately after the survey is made in the caldera, it is the operator's plan to drill for a third well for steam.

In conclusion, geothermal steam is arriving at a time when conventional sources around the world are being taxed to provide the energy that has become almost synonymous with standard of living. In this country the industry is just getting off the ground, but each successful geothermal steam project adds new energy to our country's resources and aids in the conservation of our fossil fuels. It has been shown that the Baca location No. 1 is well located to supply power for one of the fastest expanding populations in the country. Its contribution to the area as a new source of electrical power would have an important effect on New Mexico and surrounding States, and its development would certainly be in the best interests of the public welfare insofar as the conservation and optimum use of this country's natural resources are concerned. Surface and subsurface investigations to date indicate the Baca should be considered a favorable prospect for a sizable geothermal steam power project, and considerable sums are being expended to develop it as such.

(The test referred to follows:)

#### A. INTRODUCTION

This summary report covers results of tests on Baca No. 1 well, Friday and Saturday, June 14 and 15, 1963. The well was being drilled using air. The well depth at the time of the test varied from 1,300 to 1,500 feet.

## B. SCOPE

The primary purposes of the tests and observations were:

1. To assess the well potential.
2. To set up a procedure as the well was being drilled to record data that would be useful in further thermal evaluations.

## C. CONCLUSIONS

1. Observations indicate that the well is basically a steam producer based on:
  - (a) Immediate establishment of well flow after shutoff.
  - (b) Increase in well head pressure after shutoff.
  - (c) Appearance of discharge and estimated quantity of effluent.
  - (d) Quality of the effluent based on chemical analyses.
2. Based on steam flow, 10 pounds wellhead pressure and zero lip (discharge) pressure, the flow will be approximately 85,000 pounds per hour. This flow is based on saturated steam and would be higher as the moisture in the steam increased.
3. Maximum observed shut-in of pressure of 65 pounds indicates a bottom hole temperature of 310° F. to 320° F.

## D. RECOMMENDATIONS

This well with its indications as a steam producer could be a very good thermal source.

It is recommended that a formal test facility be considered as soon as practical.

Senator BIBLE. Thank you very much, Mr. Boren, for a very fine statement.

I assume that the state of the art isn't such that a reservoir engineer would be in a position to recommend the loan to his bank on a geothermal steam project at this time.

Is that or is that not correct?

Mr. BOREN. I will refer back to the Northwestern Mutual loan. They loaned \$1,200,000 nonrecourse. It was loaned on the steam. If the steam fails over a 10-year period their loan fails. In order to do that, they got a consulting report by a man from UCLA, Dr. Kennedy, and he attempted to show the longevity, the life of steam.

Senator BIBLE. I understand what you are saying about that, but, based upon your knowledge of the geothermal steam prospects at Baca location No. 1, would you be in a position now to recommend to your bank that they should make a loan, that they would be safe in making a loan to Mr. Dunigan?

Mr. BOREN. Actually, Mr. Chairman, the reason we got into geothermal steam was to find out if it is safe enough for us to make loans. Of course, Mr. Dunigan's is the closest project at hand to us right now.

Now in the same way as we do on oil, we don't loan on oil prospects. We loan on oil in the ground that we think we can measure and calculate, which means that it has to be reasonably well developed. My recommendation to my bank, and I have given them a memorandum similar to this, is that I think that when a project is developed to a certain extent, we can tell whether it has the longevity to support a loan.

Senator BIBLE. Is the geothermal steam project at Baca location No. 1 as of today in such a position that you could recommend to your bank that they should make a loan of  $x$  dollars to the Dunigan interests?

Mr. BOREN. No, sir.

Senator BIBLE. This will still take further study and further research and further drilling?

- Mr. BOREN. That is correct.
- Senator BIBLE. And testing and that sort of thing?
- Mr. BOREN. That is correct.
- Senator BIBLE. I have no further questions. Senator Anderson.
- Senator ANDERSON. Only one thing. You said Northwestern Mutual Life Insurance Co. made a loan of \$1,200,000?
- Mr. BOREN. That is right.
- Senator ANDERSON. On a nonrecourse basis?
- Mr. BOREN. Nonrecourse.
- Senator ANDERSON. On a commercial property?
- Mr. BOREN. Yes, sir.
- Senator ANDERSON. I wonder what section of the insurance investment code that was under?
- Mr. BOREN. Just like an oil payment.
- Mr. DUNIGAN. It would be just like an oil payment, Senator. They loan on oil payments without recourse.
- Senator ANDERSON. I borrowed a little oil money on oil payments, and so forth, but I never was able to get it on a nonrecourse basis. They wanted me to sign my name and they still would come back at me in case of any failure.
- Mr. BOREN. Oil payments to satisfy the requirements of the Internal Revenue Bureau have to be nonrecourse if they are used on an ABC capital gains tax purchase.
- Perhaps the oil payments you are talking about, you didn't take capital gains on it or maybe it wasn't in a sale.
- But the oil payments that we make on oil and gas properties are not exactly nonrecourse, but they are nonrecourse to the operator who is getting the benefit of the money.
- Senator BIBLE. The Senator from Idaho.
- Senator JORDAN. This is a very interesting paper, Mr. Boren. You have already said that you are not at this point ready to recommend that your bank make a loan on the prospect of success in striking a good steam supply. But the stakes are high, are they not?
- Mr. BOREN. Yes, sir.
- Senator JORDAN. The stakes are really high.
- Mr. BOREN. Yes, sir, they are.
- Senator JORDAN. Now follow me through with a little arithmetic here and help me on it. If you had an installation of 100,000 kilowatts as was suggested here by Mr. Dunigan, how many kilowatt-hours would that represent?
- Mr. BOREN. 800 million per year, not at full load factor but a reasonable load factor.
- Senator JORDAN. That is right. And if the fuel, the steam was worth 2½ mills a kilowatt-hour, you would come up with something like \$2 million a year, wouldn't you?
- Mr. BOREN. Yes, sir. It is probably something over that.
- Senator JORDAN. I just want to check my arithmetic, Mr. Chairman. The stakes are high if you connect on this.
- Mr. BOREN. That is right.
- Senator JORDAN. And have adequate supply. As you say, you would hit the jackpot.
- Senator BIBLE. Well, I hope you do.
- Are there further questions?

Senator SIMPSON. I just want to put this statement in proper perspective with Mr. Dunigan.

Mr. Dunigan, if this bill passes you know that you would lose this section of the land and you couldn't conduct any cattle operations and you couldn't conduct any geothermal exploration or any recreational development of the area either. You understand that?

Mr. DUNIGAN. Yes, sir, Senator; and that is what has me concerned.

Senator SIMPSON. I would like to have you or somebody put in an accurate tax view of this. We haven't had it. We have had two widely divergent figures.

Mr. DUNIGAN. I will be happy to furnish that to the committee no later than Monday of this week, Senator.

(The information requested is as follows:)

THE BACA LAND & CATTLE CO.,  
Abilene, Tex., June 2, 1964.

Senator ALAN BIBLE,  
Chairman, Subcommittee on Public Lands,  
U.S. Senate, Washington, D.C.

DEAR SENATOR BIBLE: First, may I thank you for your extremely courteous and fair hearing which we were accorded during our testimony in opposition to Senate bill 1870. On three occasions prior to my appearance, I had had congressmen and/or administrative assistants to several Senators tell me that I could expect a very fair hearing. You put me at ease, and I appreciated very much the opportunity to appear before you.

I trust that you received my wire of yesterday as promised during my recent appearance before your subcommittee. The question asked from the committee was a determination as to the taxes on the Baca location.

I have confirmed that the taxes for Sandoval County, which is the major portion of the ranch, were \$2,695.54 for the year 1963. In addition to this there would be the addition of taxes which Rio Arriba County would have but which were not substantial, as we have only 3,000 acres in this county. We further developed that the tax in New Mexico on grazing land is set by a State commission and is not subject to control by the individual counties. This tax is in line with other comparable grazing land, and does not include any taxation on the timbered portion of this ranch.

The statement that I gave the committee was one which had been given to me by the prior owner, which I have since verified by telephone conversation with him. His only explanation to me of the higher figure was the fact that he assumed that the taxes were payable twice a year, when, in effect, the above-mentioned figure is for the entire year.

You will recall that in my testimony, I stated that we do not start paying the taxes until January 1, 1965, because the grass is leased until that time to the King Bros., of Stanley, N. Mex. I trust this will serve to set the record straight on this point.

One other point brought up by the Park Service which I overlooked correcting at the time of my testimony, concerned whether or not the owners of the Baca location had any grazing permits on Federal lands adjoining our fee land. The member of the Park Service testifying said he felt we did have, although he was not sure. I wish to state that the former owners of the Baca location did not hold any grazing permit, nor do the present grass lessees, nor do the present owners.

I plan to drop you a further note of summary tomorrow, but wish to get this in the mail as promised in my telegram.

Respectfully yours,

JAMES P. DUNIGAN.

Senator BIBLE. Further questions of Mr. Dunigan or Mr. Boren?

Mr. DUNIGAN. The only thing I would like to ask of the committee, to paraphrase Senator Jordan that high stakes are involved, I think they are not only high stakes but that they are high stakes for the Government from the standpoint of value to the economy, to its tax

position and also to the possibility of improving this technique of geothermals to the point that these forest lands will become productive adjoining this. I would like to seriously ask the committee to put off the consideration of this part and give us time to see what a big resource we have here, and see if we can't conduct our temperature surveys and possibly do some exploration work that will give us an opportunity to truly evaluate it.

Senator BIBLE. On that point, you are a very fine engineer and accompanied by a very fine engineer, obviously a highly successful businessman.

How much time would it take until you know whether geothermal steam is going to break this economic barrier? Are you talking about 3 months, 6 months, 9 months, a year?

Mr. DUNIGAN. I think we are not talking beyond a 2-year period of time to know where we are. It may be something that is bigger than Glenn Canyon Dam. I think it is worth waiting 2 years to give us a chance to develop it.

Senator BIBLE. If you have something that is worth more than Glenn Canyon Dam you made a great purchase in 1963.

Mr. DUNIGAN. That is exactly what I think I have done, Senator. I think I have made the greatest purchase in the world.

Senator BIBLE. And I hope this works out and proves out for you because this does have great possibilities.

I still keep coming back to the point that you can still develop the geothermal steam potention, you still can produce it and create electric energy and not run inconsistent with the concept of the national park.

Mr. DUNIGAN. You mean you are saying that we should be able to continue to develop our geothermal steam, retain the mineral rights, and the right to develop on the park area?

Senator BIBLE. No, I am saying that you have in the 70 percent of the area, which is not within the park system, where you have already drilled for geothermal steam, an opportunity of proving up whether or not you can or cannot use geothermal steam to produce electric energy.

Mr. DUNIGAN. Assuming this, assuming that the whole caldera is a good prospect, which we think it is, and comparing that to an oil field, you wouldn't say I think we have some wells over here on this side, the western portion of the ranch, I think the rest of it is going to produce but let's just cut that off and if it happens to be productive, well, we have just lost it. I mean you drill in a logical pattern. You drill away from your successes, whether it is in oil or mining or anything else. You certainly don't want to give up what is prospective, just because you haven't been over there yet to prospect on it.

Senator SIMPSON. Let me state right at that juncture that you are entitled to damages from the Government if they go to condemnation of these lands. In determining the amount of damages I think any court will insist that they know the damage that will be suffered by you by virtue of losing this geothermal land.

It seems to me the quicker you develop the situation the better the court will understand the damages that you actually suffer which will have to be paid by the Government. You are entitled to a jury trial, I might add.

Mr. DUNIGAN. Yes, sir, Senator. The only thing though at \$150,000 a copy, you are just somewhat limited as to how much stepping out and exploring you can do, and I would say at this stage of it is leaves the matter so open as to what the value would be, and if Senator Anderson's suggestion that this acquisition be limited, as I understood it, to \$950,000, I wouldn't think that you could get any kind of appraisals with this geothermal potential within that realm, if I understood the suggestion.

Senator ANDERSON. I think what I tried to say was I didn't believe in paying \$9 million for something a man had offered on the market for \$500,000, just because you buy something for the Government.

Mr. DUNIGAN. Yes, sir, Senator, but didn't I understand you to say also that you thought after it was discussed about the open-ended nature of this thing, didn't you suggest that a limitation be put on the acquisition price of the land of \$950,000?

Senator ANDERSON. As far as the land is concerned because I didn't want them to get into this question of how much that timber is worth. You aren't through finding it out and Tom Gallagher isn't through finding it out on the other side and I am perfectly willing to let you sit there for 60 years and battle it as far as I am concerned, not taking the Government's money and making millions of dollars for what the Government may never harvest.

Could I ask Mr. Boren a question?

Mr. Boren, you are very much interested in this, working for the Republic National Bank for how long? The Republic National Bank asked you to take a look at this geothermal steam and you have been looking at it for how long?

Mr. BOREN. A little over a year.

Senator ANDERSON. Have you heard of Senate bill 883?

Mr. BOREN. Not unless that is the one dealing with Federal leasing on geothermal prospects.

Senator ANDERSON. Are you familiar with the hearings?

Mr. BOREN. No, sir; I am not.

Senator ANDERSON. Don't you think it would be a good idea if you are going to pass on loans to find out something about the hearing?

Mr. BOREN. So far my interest and the bank's interest has not been in the leasing of land.

Senator ANDERSON. Wait a minute; I thought you were looking into the commercial possibilities of it?

Mr. BOREN. Yes, sir; I am.

Senator ANDERSON. Wouldn't you be interested in what was developed at the hearing?

Mr. BOREN. I will be very interested in hearing what goes on there.

Senator ANDERSON. I have the feeling that the hearing sort of showed that the geothermal steam is very small indeed, very much underdeveloped, and a good proportion of the industry thinks that the minerals which are in suspension are of greater value than the heat.

Mr. BOREN. In some cases that is true, particularly in the Imperial Valley of California. They anticipate there that the potash, for instance, will bring them more and maybe the other exotic minerals that the brine contains will bring them more than the electric, but about a week or two ago I heard Donald White of USGS in Mineral Park make the statement that the Salton Sea area is not to be forgotten

for its electrical potential, too. He said that statements of the size and capability of the power there is about 2,000 megawatts or 2 million kilowatts.

So, although there is a lot of mineral capacity and capability there, there still is a lot of power generation to be done there, too. Sometimes they go hand in hand, if it is wet steam particularly.

Senator ANDERSON. Thus far the hearings would seem to indicate that this geothermal steam wouldn't make this particular 30,000 acres worth more than the Grand Canyon, though it might be. I think it is putting an awfully high value on it and I think a court would probably recognize that.

You have drilled three wells and they have all been of no real value; is that not true?

Mr. DUNIGAN. No, Senator Anderson; that is not true. We had a commercial steam well which we lost simply mechanically. That is done in the oil business all the time. We had something in the neighborhood of a 6-megawatt steam well which would be 6,000 kilowatts, and would be one-fifth of the production in the Geyser area of California, and we lost the steam well just by virtue of mechanical failure over the hole. Now this happens in drilling oil wells all the time. We think enough of it that we are moving back within 100 feet of that same well within the next 8 or 10 days to drill another well.

So we had a commercial steam well starting at 540 feet from the surface of the ground. We hit and encountered steam.

Senator BIBLE. Further questions of the witnesses?

Thank you very much, Mr. Dunigan and Mr. Boren. You are very obviously very well qualified witnesses.

Do we have further witnesses on this particular bill? If not, the hearing is terminated as to this bill. The record will be kept open 10 days for additional statements.

(Whereupon the committee turned to other business.)

(Under authority previously granted, the following statements and communications were ordered printed:)

STATEMENT OF THE NEW MEXICO RURAL ELECTRIFICATION COOPERATIVE  
ASSOCIATION

The New Mexico Rural Electrification Cooperative Association would like to make this statement in opposition to Senate bill 1870, now pending before the Congress of the United States. The New Mexico Rural Electrification Cooperative Association is an association of rural electric cooperatives in the State of New Mexico, and has its offices in room 208, Petroleum Building, Santa Fe, N. Mex. Carl M. Turner is its executive manager.

This statement was authorized by the executive committee at a meeting which was held on May 27, 1964.

Ordinarily, this association would be in favor of legislation of this type and particular for establishment of recreational facilities in northern New Mexico. Nevertheless, in this particular circumstance we think there is overwhelming evidence to support the position of Mr. James P. Dunigan and his associates. We have worked with Mr. Dunigan on the possibility of development of geothermal energy on Baca location No. 1 since he purchased the property, and are continuing to do so. The evidence is good that this unique power source can be harnessed and the electricity can be generated at a price which will be substantially lower than the power cost at present in New Mexico and the Southwest. This power can be transmitted over existing and already planned lines to a large part of New Mexico, Arizona, Utah, and Colorado, effecting substantial savings to consumers in these areas. This development will also create an industry and provide employment of a substantial nature for an

area of the State that badly needs it. Sandoval County, where this development is located, is classified as an economically depressed area.

Mr. Dunigan is also contemplating the development of a portion of the property for recreational purposes, which would also serve the needs of the public without requiring any investment on the part of the United States.

The rural electric cooperatives in New Mexico serve approximately 200,000 persons through approximately 60,000 meters. A majority of these people would be benefited if this development proceeds to a successful conclusion. We think that the amount of money that has already been invested, and the amount of investment planned for development, attest to the fact that there is a good chance of the project being successful. We would, therefore, urge that the Congress not authorize the purchase of a portion of the Baca location No. 1 at this time.

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LOS ALAMOS, N. MEX., June 1, 1964.

HON. ALAN BIBLE,  
*Chairman, Senate Public Lands Subcommittee,  
Senate Office Building, Washington, D.C.*

DEAR SIR: I address you this letter in support of the bill to create the Valle Grande-Bandelier National Park because I believe the new park will be to the best interest of the country and particularly to the Southwest and Los Alamos. I am a longtime resident of the area adjacent to Bandelier, and during this residency I have hiked and hunted the mountains of the old caldera rim extensively. Also, as manager of the utilities operation for the Los Alamos project, I have had reason to become intimately acquainted with the terrain, climate, and economy of the entire region. Furthermore, I am a charter member of the Los Alamos County Planning Commission and along with other members have been engaged in formulating a master plan for guidance of our county after Federal transfer of the community—a task requiring long foresight and thorough knowledge of the county and adjacent territory.

The Albuquerque Journal carried a lengthy story on May 30 about the hearing on Friday, May 29, held by the Senate Public Lands Subcommittee relative to acquisition of lands in the Valle Grande and creation of the national park. The owners of the land bought it with the full knowledge of the movement to create the park. Furthermore, from all that I can learn, the exploration for steam is in an area of the Valle Grande that is not within the proposed park; and, despite the owner's optimism, the successful development of geothermal steam energy source of appreciable magnitude is indeed very problematic.

The growing population of the country will need the scenic, geologic, and archeological combination to be provided by the Valle Grande-Bandelier National Park. I believe that in this and similar cases the public benefit should override the right of private ownership.

Here in Los Alamos we have an especially strong reason for supporting the proposed national park. Soon this community will be "on its own" with relatively small economic potential and tax base. We need the new national park and all other development that can be induced within the area to help build our economy and to reduce the AEC subsidy for operation of our local government. The tourism and recreational potential of the park will surely help us to stand on our own much more completely and quickly.

Your consideration of my suggestions will be greatly appreciated.

Very truly yours,

RICHARD C. CROOK.

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NEW MEXICO FARM & LIVESTOCK BUREAU,  
*Las Cruces, N. Mex., May 26, 1964.*

HON. ALAN BIBLE,  
*Chairman, Public Lands Subcommittee of the Interior and Insular Affairs Committee, Washington, D.C.*

DEAR SENATOR BIBLE: We are writing to you in regard to hearings being held on Senate bill No. 1870 which would create the Valle Grande National Park in New Mexico.

The New Mexico Farm & Livestock Bureau at their annual meeting in November 1962 passed the following resolution:

"Be it resolved that we oppose the purchase of the Valle Grande also known as Baca location No. 1, by any unit of the Government."

To create the national park would take approximately 30,000 acres of very fine grazing land out of production and would destroy a livestock producing economic unit of some 100,000 acres. It is our feeling that too much of New Mexico is now owned either by the Federal or by the State government, and that there is no reason for either taking over any more privately owned land for any purpose.

Sincerely,

J. L. AUGUSTINE, Jr., *Executive Secretary.*

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NEW MEXICO CATTLE GROWERS' ASSOCIATION, INC.,  
*Albuquerque, N. Mex., May 26, 1964.*

JERRY VERKLER,  
*Staff Director, Senate Committee on Interior and Insular Affairs, Senate Office Building, Washington, D.C.*

DEAR MR. VERKLER: We just learned that hearings have been scheduled on S. 1870. We would very much appreciate your directing this letter to the attention of the Public Land Subcommittee and making it a part of the record.

On September 17, 1962, the New Mexico Cattle Growers' Association presented a statement on S. 3321 to the Public Land Subcommittee of the Senate Committee on Interior and Insular Affairs in Santa Fe, N. Mex. We wish to quote that brief statement in full here, because most of it is completely germane to the discussion of S. 1870, and because we wish to make reference to the statement in outlining our position on this later bill. The statement was as follows:

"The New Mexico Cattle Growers' Association, is an organization made up of nearly 5,000 cattle producers, a large majority of the commercial cattle producers in this State.

"We very much appreciate the opportunity to appear before this subcommittee today and express our views on S. 3321.

"I would like to preface my remarks by pointing out that we in the cattle industry are fully aware of the growing recreational needs of this country, particularly outdoor recreation. The very nature of our business involves large tracts of real estate and we see more and more people in their station wagons and jeeps looking for places to camp, hunt, fish, or just wander around and enjoy nature.

"As responsible citizens we are also vitally interested in reducing the cost of maintaining our Government at all levels—recognizing the needs of the citizens for certain things that they look to their Government to provide. Putting things on a first-things-first basis, we feel we must consider the needs of the local citizens for decent roads, schools, law enforcement, and other necessities that are the responsibility of the local unit of government before we concern ourselves with the recreational needs of those who have the good fortune to have some spare time, energy, and money to dedicate to recreation.

"Too often, we fear, when the Federal Government takes land off the tax rolls, the local economy suffers. Federal payrolls or tourist expenditures are used to justify the loss; however, the tax revenue derived from these moneys is collected and distributed differently from the taxes previously paid on the property involved leaving the local government with less revenue, and paradoxically often more services to provide.

"We only ask that the impact of the actions contemplated by S. 3321 on the economy of Sandoval County and the State be fully studied as a part of the considerations of this subcommittee before large portions of now privately owned land be made into a national park. If the park is eventually created, we hope every effort will be made to work out a means of returning as much revenue to the local economy after the change as before. This includes not only property taxes, but ad valorem and sales taxes from timber, grazing, minerals, and all other of the many uses a tract of land this size can be put to. Spokesmen for the National Park Service are on record opposing multiple use—so if the bills are to be paid recreation must produce the income. And, if the new use is considered to be a higher priority use, possibly it should return more revenue to the local economy than before.

"I would like to expand on the point concerning multiple use. As you gentlemen know, the philosophy of multiple use has been recognized through legislation passed by Congress. The Forest Service has long held to the principle but as I mentioned, the Park Service feels that other uses are incompatible with recreation. We feel that as our population increases, not only will

recreation facilities be more in demand, but so will every resource our land can provide. It would seem imperative to carefully weigh the benefits accruing to the economy of the county, the State, and the Nation under private ownership, against the benefits of the same area under the narrowly defined uses as prescribed by the Park Service.

"One additional point. If this committee and the Congress should decide that the formation of the Valle Grande National Park is in the best public interest, we respectfully suggest that only that part needed for the park be purchased. We feel it is unnecessary to purchase the additional parts of Baca location No. 1 for the Forest Service. The Federal Government now owns over 35 percent of the land in New Mexico—and Federal land combined with State and Indian land leaves only approximately 42 percent of the land in this State in private ownership. If any change in status is indicated it should be from public to private ownership, rather than the reverse."

We wish to commend the authors of S. 1870, our own Senators, for leaving out the provision for obtaining for the U.S. Forest Service, that part of the Baca location No. 1 not needed for the park. There is still a provision of the bill that greatly concerns us, however. The wording in lines 5 and 6, "acquire by purchase, gift or otherwise the following land and improvements thereon", has caused us to reexamine our previous testimony. If the "or otherwise" is interpreted to mean the use of the power of eminent domain to obtain the land in question, we would have to oppose the legislation in spite of any other provisions.

The New Mexico Cattle Growers' Association very strongly feels that the power of eminent domain is one that should be used with great care. In a State in which only slightly over 40 percent of the land is in private hands, we can see no justification for the use of this power as a means of putting land into Federal ownership for the primary purpose of public recreation.

If S. 1870 as now written can be interpreted to allow the use of the power of eminent domain, we respectfully suggest it be amended to specifically prohibit such use, or that an additional hearing be scheduled in New Mexico so this point may be fully considered by all concerned.

Sincerely yours,

LES DAVIS, *President.*

