

OIL & GAS CONSERVATION COMMISSION
MINUTES OF MEETING / MARCH 17, 1995
STEVEN L. RAUZI, PROGRAM ADMINISTRATOR



Fife Symington
Governor

State of Arizona
Arizona Geological Survey

845 North Park Avenue, #100
Tucson, Arizona 85719
(602) 882-4795



Larry D. Fellows
Director and State Geologist

NOTICE OF COMBINED PUBLIC MEETING AND POSSIBLE EXECUTIVE SESSION

OIL AND GAS CONSERVATION COMMISSION

Pursuant to A.R.S. § 38-431.02, notice is hereby given to the members of the Oil and Gas Conservation Commission and to the general public that the Oil and Gas Conservation Commission will hold a meeting open to the public on March 17, 1995, at 10:00 a.m. in Room 500 of the State Capitol located at 1700 West Washington, Phoenix, Arizona 85007. As indicated in the agenda, the Oil and Gas Conservation Commission may vote to go into executive session which will not be open to the public to discuss certain matters.

The agenda for the meeting is as follows:

1. Call to Order
2. Approval of the Minutes of Meeting of January 20, 1995
3. Statement of Director and State Geologist
4. Report of Oil & Gas Program Administrator
5. Discuss policy on federal and Indian lands
6. Discuss potential incentive program
7. Call to the public
8. Announcements
9. Adjournment

The Oil and Gas Conservation Commission may vote to go into Executive Session, pursuant to A.R.S. § 38-431.03(A)(3), which will not be open to the public to consult with its attorney and receive legal advice with respect to any regular agenda item listed on this agenda.

A copy of the agenda background material provided to Commission members (with the exception of material relating to possible executive sessions) is available for public inspection at the Oil and Gas Program Administrator's office, 845 North Park Avenue, Suite 100, Tucson, Arizona 85719.

The public will be afforded an opportunity to comment on any item on the agenda; however, at the beginning of the meeting, the Commission may vote to set up a time limit on individual comments.

Dated this 3rd day of March 1995.

OIL AND GAS CONSERVATION COMMISSION

Steven L. Rauzi
Oil and Gas Program Administrator

PLEASE ADVISE PAM OR ME ASAP IF YOU WILL NOT BE ATTENDING THIS MEETING

THIS NOTICE IS AVAILABLE IN AN ALTERNATIVE FORMAT



Fife Symington
Governor

State of Arizona
Arizona Geological Survey

845 North Park Avenue, #100
Tucson, Arizona 85719
(602) 882-4795



Larry D. Fellows
Director and State Geologist

NOTICE OF COMBINED PUBLIC MEETING AND POSSIBLE EXECUTIVE SESSION

OIL AND GAS CONSERVATION COMMISSION

Pursuant to A.R.S. § 38-431.02, notice is hereby given to the members of the Oil and Gas Conservation Commission and to the general public that the Oil and Gas Conservation Commission will hold a meeting open to the public on March 17, 1995, at 10:00 a.m. in Room 500 of the State Capitol located at 1700 West Washington, Phoenix, Arizona 85007. As indicated in the agenda, the Oil and Gas Conservation Commission may vote to go into executive session which will not be open to the public to discuss certain matters.

The agenda for the meeting is as follows:

1. Call to Order
2. Approval of the Minutes of Meeting of January 20, 1995
3. Statement of Director and State Geologist
4. Report of Oil & Gas Program Administrator
5. Discuss policy on federal and Indian lands
6. Discuss potential incentive program
7. Call to the public
8. Announcements
9. Adjournment

The Oil and Gas Conservation Commission may vote to go into Executive Session, pursuant to A.R.S. § 38-431.03(A)(3), which will not be open to the public to consult with its attorney and receive legal advice with respect to any regular agenda item listed on this agenda.

A copy of the agenda background material provided to Commission members (with the exception of material relating to possible executive sessions) is available for public inspection at the Oil and Gas Program Administrator's office, 845 North Park Avenue, Suite 100, Tucson, Arizona 85719.

The public will be afforded an opportunity to comment on any item on the agenda; however, at the beginning of the meeting, the Commission may vote to set up a time limit on individual comments.

Dated this 3rd day of March 1995.

OIL AND GAS CONSERVATION COMMISSION

Steven L. Rauzi
Oil and Gas Program Administrator

THIS NOTICE IS AVAILABLE IN AN ALTERNATIVE FORMAT

OIL AND GAS CONSERVATION COMMISSION
845 North Park Avenue, #100
Tucson, Arizona 85719

Minutes of Meeting
January 20, 1995

Present:

Dr. J. Dale Nations, Chairman
Mrs. Lisa C. Worthington, Vice-Chair
Mr. James C. Lanshe, Member
Mr. Zed Veale, Member
Dr. Larry D. Fellows, State Geologist
Mr. Steven L. Rauzi, Oil and Gas Program Administrator

The regular Commission Meeting of January 20, 1995, was called to order by Dr. J. Dale Nations, Chairman, at 10:00 a.m. in Room 500, State Capitol Tower, Phoenix, Arizona.

APPROVAL OF MINUTES OF MEETING OF OCTOBER 28, 1994

Ms. Worthington moved, seconded by Mr. Veale:

THAT THE MINUTES OF THE MEETING OF OCTOBER 28, 1994, BE
ACCEPTED AS PRESENTED

Motion carried unanimously.

STATEMENT OF DIRECTOR AND STATE GEOLOGIST

Dr. Fellows advised that the budget was approved at the budget hearing on January 13, 1995, but that no money was appropriated for the IOGCC dues or travel. He reported that HB 2013 about plugging wells was approved at the House Natural Resource Committee meeting on January 17. He noted that a member of the Committee, Representative Allen, was familiar with oil and gas matters in Colorado and Wyoming. Dr. Fellows handed out identification cards to each of the Commissioners.

REPORT OF THE OIL AND GAS PROGRAM ADMINISTRATOR

The activity report of Mr. Rauzi was sent to the Commissioners and has been made a part of these minutes. Mr. Rauzi reported that even though testing continues on the Ridgeway well at St. Johns, they have not applied for any new wells. He reported that The Townsend Company, Abilene, Texas, continues to have interest in the western Holbrook basin area and had recently requested application forms. Mr. Rauzi also noted the continuing interest

in the San Simon area of southeastern Arizona and offered a brief discussion on the geology and potential of the two areas. Mr. Rauzi asked if Mr. Dulsky would check on the status of the rules the Commission had adopted subject to certification by the Attorney General in March 1993. Mr. Dulsky advised that he would follow up on this inquiry.

POLICY MANUAL

Dr. Fellows, noting the lack of a policy manual among most Commissions, suggested establishing a policy manual consisting of two general categories, the first to cover the general terms under which members are appointed including the expectations of Commission members, and the second to cover the specifics that relate to how the Commission chooses to conduct its business. In light of the potential of the Commission doing something on tax incentives, however, Dr. Fellows considered the policy manual to be a lower priority item at this time.

POLICY ON FEDERAL AND INDIAN LANDS

Mr. Rauzi advised that Mr. John Haas, Bureau of Land Management, was unable to attend today's meeting. The Commission agreed to table discussion on this item until it received the draft agreement covering wells drilled on federal and tribal lands from Mr. Haas.

GOALS, OBJECTIVES, AND EXPLORATION INCENTIVES

After discussing oil and gas potential in Arizona, incentives to encourage activity in the state, and the opportunity to meet with the Governor, the Commission requested Mr. Rauzi and Dr. Fellows to prepare an executive summary addressing the areas of potential and various incentive programs. The Commission suggested a one month time frame to receive the summary and set a target date of late March to meet with the Governor.

CALL TO THE PUBLIC

None.

ANNOUNCEMENTS

The next meeting was scheduled for 10 a.m. on March 17, 1995, at the Capitol Tower in Room 500.

ADJOURNMENT

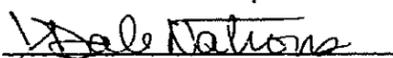
Mr. Lanshe moved, seconded by Mrs. Worthington:

THAT THE MEETING BE ADJOURNED

Oil and Gas Conservation Commission Minutes January 20, 1995 Page 3

Motion carried unanimously. Time of adjournment was 11:35 a.m.

APPROVED


Dr. J. Dale Nations
Chairman

GUESTS IN ATTENDANCE:

Beryl I. Dulsky Assistant Chief Council, Attorney General's Office



Fife Symington
Governor

State of Arizona
Arizona Geological Survey

845 North Park Avenue, #100
Tucson, Arizona 85719
(602) 882-4795



Larry D. Fellows
Director and State Geologist

March 3, 1995

To: **Oil and Gas Conservation Commissioners**
From: *SLR* Steven L. Rauzi, Oil and Gas Program Administrator
Re: **Activity Report for March 17, 1995, Meeting**

Since your last meeting, one permit was issued to Ridgeway Arizona Oil Company on January 27 for the 3-1 State. This will be the first confirmation well to the 1 Plateau Cattle Company, which Ridgeway announced as a possible carbon dioxide and helium discovery in August 1994. Drilling had not started as of this writing.

With respect to agenda item 6, I contacted several states to obtain a copy of any proposed or existing legislation they may have to encourage exploration and drilling. Responses were received from several states. These responses, and the oil and gas potential of several regions in Arizona, are summarized in the attached draft reports.

In early February, Mr. Jon Fiegen and I discussed certification of the rules you adopted on March 12, 1993. The main concern of the Attorney General at that time seemed to be whether or not a geothermal well could be permitted without notice and hearing in light of A.R.S. §§ 27-659 and 27-655. At Mr. Fiegen's request, I prepared a memo explaining how the procedure for permitting a geothermal well is the same as for permitting an oil and gas well and that only geothermal injection wells require notice and hearing. I prepared a second memo on this matter to Mr. Dulsky.

Also with respect to the rules, the *Concise Explanatory Statement* signed by you on March 12, 1993, was revised to note the changes to the rules that were made for the purpose of clarification after consultation with the Attorney General. The Chairman will need to sign this revised statement, which is attached.

Mr. John Haas, Bureau of Land Management, may be in attendance to advise you on the status of the data sharing agreement between the Commission and the BLM.

CONCISE EXPLANATORY STATEMENT

Title 12, Chapter 7, Article 1: *Oil, Gas, and Helium, and Geothermal Resources*

1. The Oil and Gas Conservation Commission, pursuant to A.R.S. § 27-516.A, has adopted the following rules, as amended, to regulate the completion, testing, operation, plugging, and abandonment of class II storage-wells and wells drilled for oil, gas, and geothermal resources. These rules prevent waste, protect the public's health and safety and the environment, and ensure the conservation and maximum recovery of these resources. A brief description and the specific statutory authority for each rule is as follows:

<u>RULE NO.</u>	<u>BRIEF DESCRIPTION</u>	<u>A.R.S. AUTHORITY</u>
R12-7-101	Definitions	27-516; 27-656
R12-7-119	Well & lease equipment	27-503.B(3),(4); 27-516.A(1)(c),(d),(5); 27-656
R12-7-120	Fire, leaks, and blowouts	27-503.A; 27-503.B; 27-516.A(6),(7); 27-652
R12-7-121	Well completion	27-516.A(2); 27-522.B; 27-656
R12-7-122	Recompletion	27-516.A(2),(9); 27-652; 27-655; 27-656
<u>R12-7-125</u>	<u>Temporary abandonment</u>	27-516.A(1),(4),(6); 27-656.A
R12-7-126	Intention to plug	27-516.A(1); 27-656
R12-7-127	Plugging methods	27-516.A(1); 27-656
R12-7-128	Stratigraphic and seismic holes	27-501(21); 27-656
R12-7-129	Convert to water well	27-516.A(1); 27-656
<u>R12-7-175</u>	<u>Underground injection</u>	27-516.A(20); 27-656.A
R12-7-176	Permit for injection well	27-516.A(20); 27-516.B; 27-517; 27-655; 27-656
R12-7-177	Casing of injection	27-516.A(20); 27-656
R12-7-178	Injection operations	27-515.B(3); 27-516.A(2),(8),(20); 27-653; 27-656
R12-7-179	Testing & monitoring of injection	27-503.B(6); 27-516.A(20); 27-653
R12-7-180	Storage wells	27-516.A(20); 27-516.B; 27-517
R12-7-181	Storage well design & construction	27-516.A(20)
<u>R12-7-182</u>	<u>Storage well operation</u>	27-516.A(20)

2

CONCISE EXPLANATORY STATEMENT
Title 12, Chapter 7, Article 1: *Oil, Gas, and Helium, and Geothermal Resources*
Page 2

After reviewing these rules pursuant to A.R.S. § 41-1054, the Oil and Gas Conservation Commission (1) repealed A.A.C. R12-7-177 because it is redundant with R12-7-110 and R12-7-111, repealed Appendix 1 in Article 1 because all reference to it has been removed, and repealed Article 2, *Geothermal Resources* because Article 2 has been fully integrated into Article 1, (2) adopted R12-7-125 to regulate temporary abandonment of wells, adopted R12-7-175 to classify injection wells consistent with federal EPA definitions, adopted R12-7-182 to regulate the operation, inspection, and closure of storage-well systems, and (3) amended the title of Article 1 to reflect the integration of language that covers geothermal resources and amended A.A.C. R12-7-101, R12-7-119 through R12-7-122, R12-7-126 through R12-7-129, R12-7-176, and R12-7-178 through R12-7-181 to remove definitions repeated in statute or not used, update and clarify language, edit for consistency and grammatical accuracy, remove gender-specific terminology, account for currently accepted practices in the regulated industry, and incorporate language to include geothermal resources.

Reasons for amending each specific rule follows:

R12-7-101: This rule was amended to remove definitions that appear in statute or are no longer used or are defined in a particular rule. These changes were necessary because definitions in rules should not repeat the same definitions in statute. This rule was also amended to improve clarity and understanding of the definitions.

R12-7-119: This rule was amended to clarify the types and strengths of valves required on oil, gas, or geothermal wellheads. It was divided into subsections and paragraphs to improve clarity and understanding of which type of valve is required on which type of well, i.e. oil, gas, or geothermal.

R12-7-120: This rule was amended to clarify an operator's notification procedures for fires, leaks, and blowouts. Numbering was added to the subsections to improve clarity, the language was amended to be gender neutral, and language from R12-7-219 was incorporated to include such procedures on geothermal resources wells.

R12-7-121: This rule was amended to clarify language, remove reference to specific forms and appendix, and incorporate geothermal resources wells. Subsection B was amended to be consistent with A.R.S. 27-522(B) for oil wells and with A.R.S. 27-653 for geothermal resources wells. The title was amended to reflect that the rule applies the filing requirement for completed wells.

R12-7-122: The title was amended to reflect that the rule applies to recompletion and routine maintenance operations for existing, permitted wells. Language was simplified and amended to remove reference to specific forms and appendix. Subsections were reorganized and renumbered to improve the flow of the rule from recompletions to routine maintenance operations.

R12-7-125: This rule was adopted to regulate the temporary abandonment of wells. It sets standards such as duration and renewal of temporary abandonment status that were previously undefined.

R12-7-126: This rule was amended to simplify language, remove reference to specific forms and appendix, add proper numbering to subsections, and to make language of the rule gender neutral.

R12-7-127: This rule was amended to simplify language and remove reference to specific forms and appendix. Subsections were reorganized and clear standards for plugging cased, uncased, and seismic holes were added to improve clarity. Cross-reference was made to R12-7-126.

R12-7-128: This rule was amended to simplify language and remove reference to specific forms and appendix. Language redundant with other rules was removed and replaced with cross-references to the appropriate rules.

R12-7-129: This rule was amended to simplify language, remove reference to specific forms and appendix, and make the language gender neutral. A cross-reference to R12-7-127 was incorporated to clarify plugging requirement.

R12-7-175: This rule was adopted to define which types of injection wells require a permit from

CONCISE EXPLANATORY STATEMENT
Title 12, Chapter 7, Article 1: *Oil, Gas, and Helium, and Geothermal Resources*
Page 3

the Commission and to point out which rules apply specifically to these wells by cross-reference to R12-7-176, 178, 179, 180, 181, and 182. It was structured to be consistent with federal requirements and with the state's application for primacy over these types of wells.

R12-7-176: This rule was amended to simplify language, remove reference to specific forms and appendix, and incorporate language to cover injection wells associated with geothermal resources. Language redundant with other rules in the Chapter were removed and replaced with cross-reference to appropriate rules.

R12-7-177: This rule was repealed because it was redundant with R12-7-110 and R12-7-111.

R12-7-178: This rule was amended to simplify language and remove reference to specific forms and appendix. Language was added to clearly state coverage of storage wells and requirements relative to transfer of ownership of injection wells. Cross-references to appropriate rules were added.

R12-7-179: The title of this rule was amended to clearly reflect its coverage of well monitoring, records, and reports. Language was simplified, reference to specific forms and appendix was removed, language covering geothermal resources was incorporated, and cross-references to appropriate rules were added.

R12-7-180: This rule was amended to provide supplementary requirements for storage wells, the general permitting requirements for which are covered in R12-7-176. These supplementary requirements are necessary because of the unique nature of storage wells. These requirements could have been added to R12-7-176 but that would have resulted in an overly long and cumbersome R12-7-176.

R12-7-182: This rule is former rule R12-7-181 subsections (1)(h) through (1)(m) which regulate the operation and closure of LPG-storage systems. These subsection were hard to locate because they were buried in a rule with a completely unrelated title on construction requirements. These subsections were, therefore, amended, renumbered, and transferred to R12-7-182 and assigned an appropriate title.

One alternative to amending the rules as noted above would have been to retain Appendix 1 in Article 1; however, this alternative is not feasible because the basic data required in a form is now spelled out in the text of the rules and all reference to Appendix 1 and specific forms has been removed in the amended rules. Another alternative was to continue with Article 2, *Geothermal Resources*; however, this is not feasible because Article 2 has been fully integrated into Article 1, which has been retitled to reflect this incorporation, and to continue with Article 2 would be redundant and add unnecessary printing and copying costs to the State. Another alternative was to continue with the language of the amended rules as currently written. This alternative is not feasible because the rules contain archaic words or phrases, are not gender neutral, or are written in passive voice.

2. No written comments were received on this group of rules after they were approved by the Governor's Regulatory Review Council on January 5, 1993, and after they were published in the January 29, 1993, issue of the *Arizona Administrative Register*. However, in consultation with the Attorney General, changes were made for the purposes of clarification in the text of the proposed rules contained in the notice of proposed rule adoption filed with the Secretary of State on January 13, 1993, pursuant to §41-1022 and the text of the rules as finally adopted by the Oil and Gas Conservation Commission.

Specific changes made for the purposes of clarification to the rules filed with the Secretary of State on January 13, 1993, include the following:

1. **R12-7-101:** Language was changed to improve clarity in definitions 7, 10, and 11.
2. **R12-7-119:** Language was retained to improve clarity in Subsection (A)(1) and language was reworded to improve clarity in Subsection(A)(2).

CONCISE EXPLANATORY STATEMENT
Title 12, Chapter 7, Article 1: *Oil, Gas, and Helium, and Geothermal Resources*
Page 4

3. **R12-7-120:** Redundant language was removed to improve clarity in Subsection (B).
 4. **R12-7-121:** Language was revised to improve clarity in Subsection (A) and (C).
 5. **R12-7-122:** Language was removed to improve clarity in Subsection (C).
 6. **R12-7-126:** Language was added to improve clarity in Subsection (B). Language was replaced to improve clarity in Subsection (A).
 7. **R12-7-127:** Language was revised to improve clarity in Subsections (H) and (J).
 8. **R12-7-176:** Add language to improve clarity in Subsections (A) and (B)(7). Remove language to improve clarity of Subsections (B)(2-4), and (C). Replace language to improve clarity in Subsections (B)(2)(c) and (B)(3)(f).
 9. **R12-7-179:** Add language to improve clarity in Subsections (A) and (D)(1). Strike language to improve clarity of data to be reported in Subsection (C). Remove language to improve clarity in Subsection (D)(2).
 10. **R12-7-181:** Add language to improve clarity in Subsections (A), (C), and (C)(1). Move language to improve clarity in Subsection (A). Remove or strike language to improve clarity in Subsections (A), (B), and (C)(1). Replace language to improve clarity in Subsection (B).
 11. **R12-7-182:** Add language to improve clarity in Subsections (A)(3), (C)(6), (E), and (I). Remove or strike language to improve clarity in Subsections (A), (A)(1, 2, and 4), (C), (C)(6), (E), (F), and (G). Replace language for clarity in Subsection (A).
3. Arguments for these rules are (1) they require operators to install and maintain wellhead and lease equipment to measure production and prevent hazards, (2) they require operators to submit proposed procedures to the Commission for approval before a well is plugged and abandoned or converted to a water well and to submit well logs, reports, and samples to the Commission upon the completion of a well, (3) they require operators to meet unique construction, operation, and reporting requirements for Class II injection wells including disposal, storage, and enhanced recovery wells, and (4) they prevent waste, protect the public's health and safety and the environment, and ensure the conservation and maximum recovery of oil, gas, and geothermal resources.

No arguments were received against this set of rules.

Dated this 17th day of March 1995.

OIL AND GAS CONSERVATION COMMISSION

J. Dale Nations
Chairman

Chronological Outline of Steps in Getting Oil and Gas Rules Certified

- October 23, 1992.
Oil and Gas Conservation Commission initiates rulemaking proceedings.
- January 5, 1993.
Rules reviewed and approved by Governor's Regulatory Review Council.
- January 13, 1995.
Rules filed with Secretary of State. Notice of adoption published in the January 29, 1993, issue of *Arizona Administrative Register*.
- March 12, 1993.
Rules adopted by Commission and sent to Attorney General Office (AGO) for certification.
- August 3, 4, 6, 9, and 11, 1993.
Discuss rules with Jon Fiegen, AGO. Revise per discussions for clarity and mail revised pages to Jon with request to advise of any additional changes necessary for certification.
- March 10, 1994.
No response from AGO. Leave message for Jon Fiegen. He calls with questions on R12-7-121(A) and 122(A) and requests copy of Concise Explanatory Statement for 1st and 2nd groups.
- March 30, 1994 and April 4, 1994.
Discuss rules with Jon Fiegen. Revise per discussions for clarity and mail revised pages to Jon with request to advise of any additional changes necessary for certification.
- June 24, 1994.
No response from AGO. Telecopy inquiry on status of pending rules to Elizabeth Stewart, AGO. She phones to advise that some rules are not certifiable, to discuss specifics with Jon Fiegen. Telecopy a request for what revisions are necessary for certification to Jon Fiegen.
- July 6, 1994 and August 9, 1994.
Discuss rules with Jon Fiegen. Revise rules per discussions for clarity and revise Concise Explanatory Statement to note changes made after consultation with AGO. Mail revised pages and statement to Jon with request to advise of any additional changes necessary for certification.
- August 22, 1994.
Contact Jon Fiegen. He advises that rules have gone to Elizabeth Stewart.
- December 22, 1994.
No Response from AGO. Send note to Elizabeth Stewart to please let me know if I may answer any questions or provide clarification to assist in getting the rules certified.
- January 20, 1995.
No response from AGO. Request status on rules from Beryl Dulsky in Commission meeting.
- February 3, 1995.
Jon Fiegen advises of his meeting with Beryl Dulsky and Elizabeth Stewart. Discuss rules in light of meeting. I prepare and mail a memo explaining procedure for permitting geothermal well and opinion on why a hearing is not required before issuing a geothermal well permit.
- February 28, 1995.
Prepare second memo explaining procedure for permitting geothermal well to Beryl Dulsky.

Memo: Mr. Beryl I. Dulsky, Chief, Environmental Enforcement Section
Attorney General's Office

From: *SLR* Steven L. Rauzi, Oil and Gas Program Administrator
Arizona Geological Survey

Date: February 28, 1995

Re: Pending Oil and Gas Rules adopted by Commission on March 12, 1993

I discussed the referenced rules with Jon Fiegen in early February. A main concern at that time was if the Commission may permit a geothermal well without notice and hearing. A.R.S. § 27-659 indicates that it may, whereas A.R.S. § 27-655 indicates that it may not. In my opinion, a hearing is not required for permitting a geothermal well. On February 3, I prepared a memo to Jon explaining my opinion, I am again explaining my opinion with this memo to you.

A.R.S. § 27-659 is the authorizing statute for permitting geothermal wells. It does not require a hearing. The Commission issues the permit when the requirements of R12-7-104 are met. Importantly, there is no way to know what the nature of the geothermal resource at depth is until the well is drilled. A hearing for permitting an exploratory well, when it is not known what will be encountered at depth, would not add anything new to the requirements in R12-7-104. It would be costly and an unnecessary burden both to the operator and to the Commission.

Water, warm water, hot water, steam, or maybe just very hot rock may be encountered at depth. Depending on the nature of the geothermal resource at depth, an operator may approach the Commission with a plan of action. At this point, A.R.S. § 27-655 is the authorizing statute. If injection is part of the plan, the Commission would judge the plan in light of the requirements of R12-7-176.

A.R.S. § 27-655 deals with regulation of geothermal pools and authorizes the Commission to establish fieldwide rules unique and applicable to a specific pool to conserve geothermal resources and to protect the correlative rights of each owner in a pool. For example, R12-7-107 sets statewide well-spacing requirements, which may need to be modified because of the unique geology and engineering parameters of a particular geothermal pool, i.e. the nature of the particular geothermal resource.

A.R.S. § 27-655, taken in the overall statutory scheme to regulate geothermal resources, allows the Commission to establish, upon notice and hearing, special fieldwide rules with respect to drilling, completion, and spacing requirements. These special rules take into account the unique geology or engineering parameters in a particular pool.

MEMORANDUM

TO: Mr. Jon B. Fiegen
Assistant Attorney General
Environmental Enforcement Section

FROM: *SLP* Steven L. Rauzi
Oil & Gas Program Administrator
Arizona Geological Survey

DATE: February 3, 1995

RE: Pending Oil and Gas Rules

The procedure for approval of a geothermal well is the same as the procedure for approval of an oil or gas well (A.R.S. §§ 27-659, 27-513, and A.A.C R12-7-104). In each case the application is reviewed and is approved only after it is determined that it meets all the requirements set forth in A.A.C. R12-7-104.

It is possible for a geothermal well to become a producing well (completed well) without stimulation, induction or creation. For example, a well drilled into a permeable (fluids move easily) formation at depth containing hot water or steam could be completed by simply installing a valve at the surface and turning it on or off. This well would not come under A.R.S. § 27-655.

On the other hand, if a geothermal well is drilled into hot, dry rock at depth, which contained no water or fluids, it could not become a producing well (completed well) until water or some other substance is injected into it to be converted (stimulated, induced, or created) to steam and produced. This well would come under A.R.S. § 27-655. It would also come under A.A.C. R12-7-176, which states that "the injection of any substance into any geologic formation is prohibited unless first authorized by the Commission after notice and hearing."

In this regard then, at least in my opinion, A.R.S. § 27-516(A)(20) [specific authority for A.A.C. R12-7-176] is a comparable counterpart to A.R.S. § 27-655 [geothermal authority].

We issued 1 geothermal well permit in 1993, 5 oil and gas well permits in 1994, and, so far, 1 oil and gas well permit this year. The geothermal test was not successful and the operator did not make any application to stimulate, induce, or create geothermal energy (i.e. make application for injection well pursuant to A.A.C. R12-7-176).

Finally, A.A.C. R12-7-122(C) covers routine maintenance operations on existing wells whose physical effects are confined to the area near the well bore. This includes such things as acidizing or fracturing to clean wax or dissolve or break through calcium buildup in perforated pipe or rock formations to *restore* existing but diminishing production.



Fife Symington
Governor

State of Arizona
Arizona Geological Survey

845 North Park Avenue, #100
Tucson, Arizona 85719
(602) 882-4795



Larry D. Fellows
Director and State Geologist

March 31, 1995

Memo: Commissioners

From: Steve Rauzi *SR*

The revised, final copy of the report on oil and gas potential in Arizona is enclosed. It incorporates the points discussed in your March 17 meeting and has been reviewed and accepted by Larry.

The report and list of incentive programs in adjacent and other states (including the March 3 memo on two suggested incentives for Arizona) are now ready for mailing. I will advise you when this office receives word about the appropriate recipient and date for this mailing.

EXECUTIVE SUMMARY

Arizona has potential for oil and gas recovery

Potential for oil and gas recovery in Arizona is documented by several lines of evidence including (1) production of oil and gas in the northeastern part of the state, (2) past production of helium in the Holbrook Basin, (3) surface occurrences of petroleum-bearing rocks, (4) shows of oil and gas in wells, and (5) extensive regions of untested rocks containing both reservoir and source beds.

Oil and gas production in northeastern Arizona is from rocks similar in age and character to rocks that have produced over 400 million barrels of oil in southeastern Utah, southwestern Colorado, and northwestern New Mexico. Extensive areas with these rocks remain undrilled in northeastern Arizona. As a result, many oil traps may yet be found. Large deposits of coal in Black Mesa Basin have excellent potential for recovery of coalbed gas.

Both Holbrook Basin in central Arizona and Pedregosa Basin in southeastern Arizona contain rocks that are similar in age and character to the prolific Permian Basin of west Texas. Salt is present in the Holbrook and Permian Basins. Reefs are present in the Pedregosa and Permian Basins. Extensive portions of these two basins remain untested by drilling, leaving open the very real potential for undiscovered oil traps. A petroleum-bearing limestone unit, past production of helium, and current encounter of carbon dioxide enhance the potential of Holbrook Basin.

Rocks beneath the Arizona Strip have produced oil in southwestern Utah in the Virgin field. Continuity of these rocks from southwestern Utah into northwestern Arizona, surface seeps of oil, numerous reports of oil shows in wells, and relatively low drilling density indicate good potential for recovery of oil and gas.

Yuma Basin contains a thick sequence of rocks, the lower part of which has produced up to 5.7 million cubic feet of gas a day from a well in the northern Gulf of California. These productive beds may extend northward into Yuma Basin, where no wells have been drilled deeply enough to encounter them. The prolific Los Angeles Basin may have been in proximity to Yuma Basin before being moved northward along the San Andreas fault.

The evidence, therefore, documents that Arizona has potential for oil, gas, helium, and carbon dioxide recovery. Because the key to tapping this potential is simply to drill more wells, any incentive program that encourages drilling will more than pay for itself should a discovery and consequent development of an industry take place in Arizona.

S.L. Rauzi, 3/31/95

ARIZONA HAS POTENTIAL FOR OIL AND GAS RECOVERY

Purpose of report

This report was written to document the fact that Arizona has potential for oil and gas recovery. The report describes evidence for this potential, offers reasons for the current low level of exploration activity, and examines six regions with varying potential for a discovery.

Evidence of potential

Arizona has potential for additional oil, gas, and helium production. Evidence includes surface rocks having a strong odor of petroleum, surface seeps of oil, shows of oil and gas in wells, and extensive regions with thick layers of untested sedimentary rocks.

At the present time, 20 oil wells and 6 gas wells are producing from fields in the northeastern corner of the state. Cumulative production from these fields, as of January 1995, includes more than 20 million barrels of oil and more than 25 billion cubic feet of natural gas. Past production, in the Holbrook Basin, includes more than 9 billion cubic feet of gas containing 8 percent helium.

The evidence, therefore, strongly suggests that a future discovery of oil and gas in Arizona is a very real possibility.

Hurdles to exploration in Arizona

The key to finding more oil and gas in Arizona is simply to drill more wells. Two big hurdles to drilling in Arizona are the current low price of oil and the consequent reluctance of industry to drill wells in remote, untested places like Arizona. Few companies are willing to drill such remote wells during current economic conditions. Most are drilling wells in low risk projects close to existing production and sources of supply. Wells drilled in Arizona, on the other hand, are remote from existing production and sources of supply. This drives up costs, dramatically in some cases, and increases risk.

Even so, from one to five requests are made to drill in Arizona every year. Obviously, the companies making these requests recognize the potential of Arizona, in spite of the risks involved. Extensive regions in Arizona remain underdrilled compared with other states. Drilling density in Arizona is approximately 1 well per 100 square miles compared with 160 wells per 100 square miles in Utah, 500 wells per 100 square miles in Texas, and 600 wells per 100 square miles in Oklahoma.

Seeps, petroleum-bearing rocks, and oil shows in wells

Surface seeps, petroleum-bearing rocks, and shows of oil and gas in wells document the presence of oil and gas in rocks of Arizona. Surface seeps, present in several areas in northwestern Arizona, are characterized by tar in fractures and oil-impregnated rocks.

Petroleum-bearing rocks are present in Grand Canyon, along the Mogollon

Rim, and in many areas in southeastern Arizona. These rocks are characterized by a strong odor of petroleum on freshly broken surfaces. This indicates the presence of petroleum in the rocks.

Files maintained by the Arizona Geological Survey, the American Stratigraphic Company, and Petroleum Information Corporation document the reported shows of oil and gas. Most shows are described as oil stains on grains and along fractures, as fluorescence in drilling mud and on rock fragments, or as blows or bubbles of gas in drilling mud. Stronger shows are described as films or rainbows on drilling mud, as oil bleeding from fractures, or as residual or dead oil in pores of the rock. The strongest shows are reported as free oil and oil-cut mud recovered from tests performed during or shortly after drilling.

Surface seeps, petroleum-bearing rocks, and shows of oil and gas in wells are significant. They indicate the existence of rocks capable of generating oil and gas and suggest that oil and gas have migrated through the rocks in the past. If oil has migrated through subsurface rocks, there is a good chance some of it may have been trapped as well. The trick is to find the trap, and the best way to do that is to drill wells in prospective areas.

Prospective areas

Prospective areas include thick accumulations of untested rocks that contain organic-rich layers capable of generating oil and gas (source rocks), and porous layers capable of holding commercial accumulations of oil and gas (reservoir rocks). Oil and gas are trapped in porous layers when impermeable layers, such as shale, seal the porous layers over folds or faults or when porous layers change laterally into impermeable layers.

Prospective areas are present in several underdrilled regions of Arizona. Drilling density in Arizona, as a whole, and the Holbrook Basin is close to 1 well per 100 square miles. For the Black Mesa and Pedregosa Basins it is closer to 1 well per 250 square miles.

REGIONS WITH GOOD OIL AND GAS POTENTIAL IN ARIZONA

Six regions in Arizona are considered to have the best potential for additional oil, natural gas, carbon dioxide, or helium recovery (Figure 1). Each region contains prospective areas with potential source and reservoir rocks. Each contains either seeps, petroleum-bearing rocks, or wells with shows of oil or gas. Some contain all three. One has current production of oil and gas.

Paradox Basin

The northeastern corner of the state includes the southernmost margin of the Paradox Basin, most of which lies in southeastern Utah (Figure 2). Rocks in this

region are continuous with rocks in southeastern Utah where the giant Aneth oil field, just north of the Utah line, has produced more than 385 million barrels of oil. All current production in Arizona is from the Paradox Basin.

The approximate oil and gas reserves per well in the producing fields of northeastern Arizona are well established. They range from about 100,000 barrels of oil per well at Walker Creek Field to about 500,000 barrels of oil per well at Dinehbi-Keyah Field. Reserves at Black Rock Field are about 1 billion cubic feet of gas per well. This range of approximately 100,000 to 500,000 barrels of oil per well and 1 billion cubic feet of gas per well provides a reasonable minimum estimate of potential reserves of oil or gas per well from a future discovery in Arizona.

Potential of the Paradox Basin in Arizona is considered very good. Existing production may be enhanced considerably through horizontal drilling technology or secondary recovery methods such as water or carbon dioxide flooding. Several states, in fact, have adopted incentive programs to stimulate these types of projects to enhance production. All land in this region is part of the Navajo Reservation. Drilling depths are moderate, ranging from 4,000 to 6,000 feet.

Holbrook Basin

The Holbrook Basin, in east-central Arizona (Figure 1), contains rocks that are similar in age to rocks in the prolific Permian Basin of west Texas. The Holbrook Basin, like the Paradox and Permian Basins, contains salt and gypsum, which are commonly associated with oil and gas production in many parts of the world. Although the Permian Basin contains reefs, none have been identified in the Holbrook Basin. Nearly 740 million cubic feet of pure helium were produced in the northeastern part of the Holbrook Basin in the 1960's and 1970's (Figure 1).

In August 1994, a well drilled in the east-central part of the Holbrook Basin, about 7 miles southeast of St. Johns, was announced as a potential carbon dioxide and helium gas discovery (Figure 1). A test of the producing interval yielded 640,000 cubic feet of 90% carbon dioxide and .65% helium per day. Additional drilling is planned to delineate and verify the potential reserves of carbon dioxide and helium. It is quite possible that oil might be found if drilling in the St. Johns area continues.

Oil bleeding from vertical fractures was observed by the author in a well drilled in the southeastern part of the Holbrook Basin in the summer of 1993 (Figure 1). Studies show that deeper wells drilled in this area may encounter rocks with a high potential to generate liquid petroleum.

Oil stains on rock surfaces were reported in a well drilled in the western part of the Holbrook Basin (Figure 1). An oily scum was reported on residue of the rock that was dissolved in acid. These shows document the past migration of oil through the subsurface rocks there.

Potential of the Holbrook Basin is considered good to very good. State, federal, and private lands are available for leasing. Drilling depths are shallow to

moderate, ranging from less than 4,000 to 6,000 feet. Drilling density is about 1 well per 100 square miles.

Arizona Strip

The Arizona Strip, in northwestern Arizona between Grand Canyon and Utah (Figure 1), contains rocks of shallow marine origin on the east and rocks of deep marine origin on the west. Rocks in this region have produced oil in southwestern Utah. Surface seeps of tar in fractures are present in several areas in the Arizona Strip, as are wells with reported shows of oil. A test in one of these wells (Figure 1) recovered 20 feet of oil and 70 feet of oil-cut mud. Oil in this region may have accumulated in the lower parts of folds because of low subsurface pressures.

Potential of the Arizona Strip is considered good to very good. Land available for leasing in this region is mostly federal but scattered tracts of state and private land are present. Drilling depths are shallow to moderate, ranging from less than 4,000 to 6,000 feet. Drilling density is about 1 well per 135 square miles.

Yuma Basin

The Yuma Basin, in the southwestern corner of Arizona (Figure 1), contains an exceptionally thick sequence of rocks, which thicken to the south in the northern part of the Gulf of California. In 1973, Exxon drilled a well to a depth of 11,400 feet in the Yuma Basin (Figure 1) without reaching the base of the rock sequence. To the south, in the northern Gulf of California, Pemex drilled a 16,400-foot well without reaching the base of the rocks (Figure 2). The Pemex well was reported to have flowed 5.7 million cubic feet of gas a day at a depth of 13,500 feet. The producing interval in the Pemex well may extend northward into Yuma Basin.

The prolific Los Angeles Basin may have been in proximity to Yuma Basin before being moved northward along the San Andreas fault.

Potential of Yuma Basin is considered fair to good. State, federal, and private lands are available for leasing. Federal land in this part of Arizona includes the Barry M. Goldwater Aerial Gunnery Range which may hold potential for oil and gas, but which is currently withheld from exploration by the federal government. Drilling depths are moderate to deep, ranging from 4,000 to 20,000 feet.

Pedregosa Basin

The Pedregosa Basin, in southeastern Arizona (Figure 1), contains rocks that are similar in age and character to rocks in the Permian Basin of west Texas. Stream and lake deposits, some containing gypsum, fill broad valleys between the mountains.

Petroleum-bearing rocks are present in the Tucson, Whetstone, Dragoon, and Chiricahua Mountains. A well southeast of Tombstone (Figure 1) was reported to have recovered 450 feet of oil-cut mud in a test. Shows are reported in wells near Douglas and San Simon. In 1958, Humble Oil Co. drilled a 14,500-foot well in the

southwestern New Mexico part of Pedregosa Basin (Figure 2). Gas shows were reported from 4,190 to 4,219 feet. More than 40,000 acres of land have recently been leased for oil and gas near San Simon.

Pedregosa Basin, like the other basins in this report, remains underdrilled. Very few wells have tested the rocks underlying the stream and lake deposits filling the broad valleys. These are the rocks that are similar in age and character to rocks in the Permian Basin of west Texas.

Potential of Pedregosa Basin is considered fair to good. Interstate pipelines cross the region, providing an outlet for future recovery. Private, state, and federal lands are available for leasing. Drilling depths are moderate to deep, ranging from 4,000 to 15,000 feet.

A major hurdle to drilling deep test wells in Pedregosa Basin, as in Yuma Basin, is the extremely high cost of moving in the necessary deep-drilling equipment.

Black Mesa Basin

Most of Black Mesa Basin in northeastern Arizona is within the Navajo-Hopi joint-use area (Figure 1). Black Mesa Basin contains an estimated 21 billion tons of coal reserves, only one billion tons of which are classified as recoverable. The remaining 20 billion tons, at depths between 300 and 1,700 feet, hold excellent potential for coalbed methane gas.

Potential for oil and gas is considered good to very good. All land in this region is part of the Navajo or Hopi Reservations. Drilling depths for coalbed methane are shallow, ranging from 500 to 2,000 feet. Drilling depths for oil and gas are moderate, ranging from 4,000 to 6,000 feet.

Conclusion

Plainly, the evidence shows that Arizona has potential for additional oil, gas, and helium recovery. The evidence includes current production, petroleum-bearing rocks, oil seeps, shows of oil and gas in wells, and prospective areas. Six regions have good to excellent potential.

The key to finding additional oil, gas, and helium in Arizona is simply to drill more wells. If the State will help offset the higher costs and risks of drilling wells in Arizona, i.e. help get these wells drilled, exploration might be stimulated. A discovery of oil, gas, or helium will create jobs and revenue for the State.

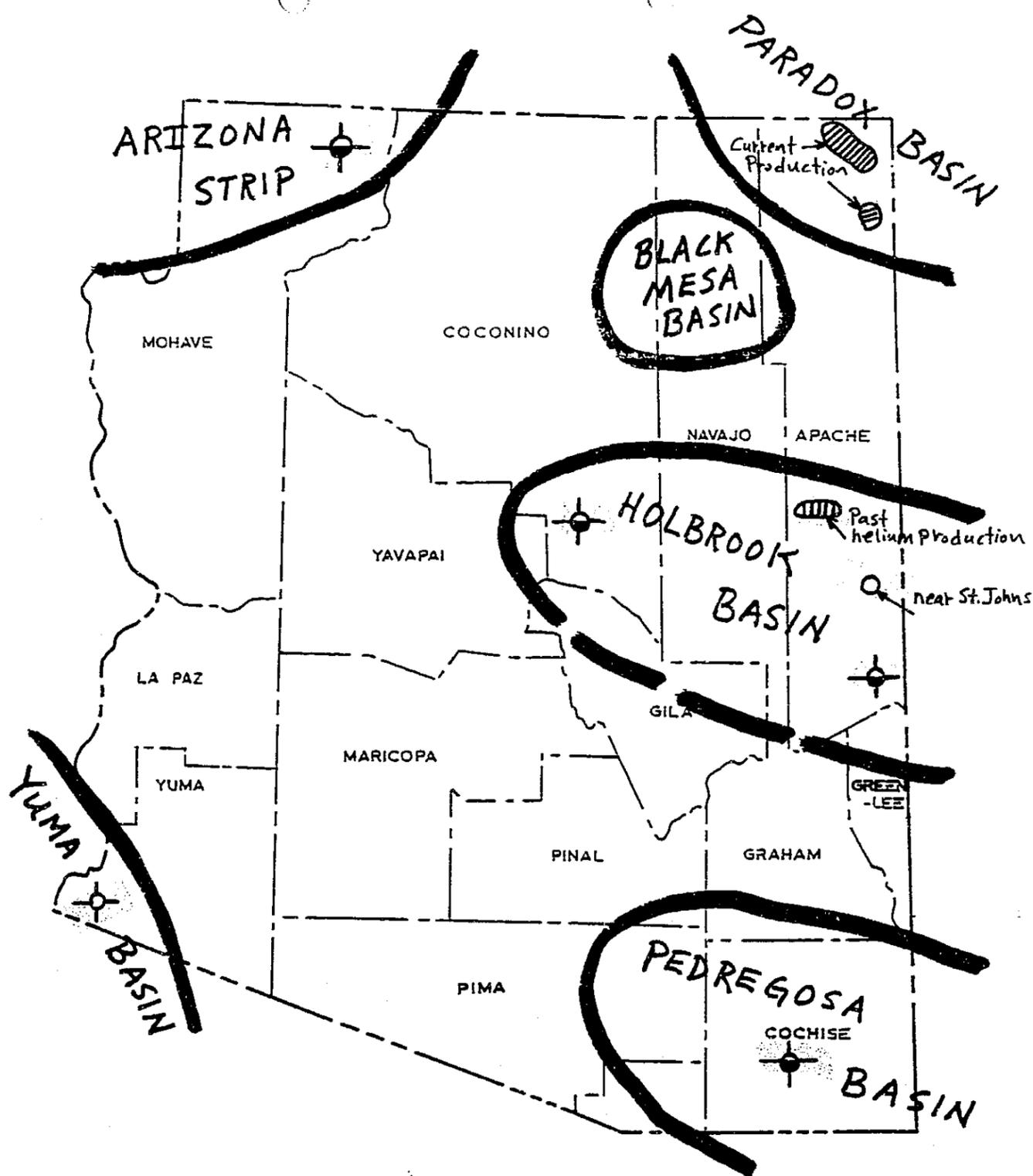


FIGURE 1. REGIONS WITH OIL AND GAS POTENTIAL IN ARIZONA SHOWING SELECTED WELLS AND PRODUCING AREAS REFERRED TO IN TEXT

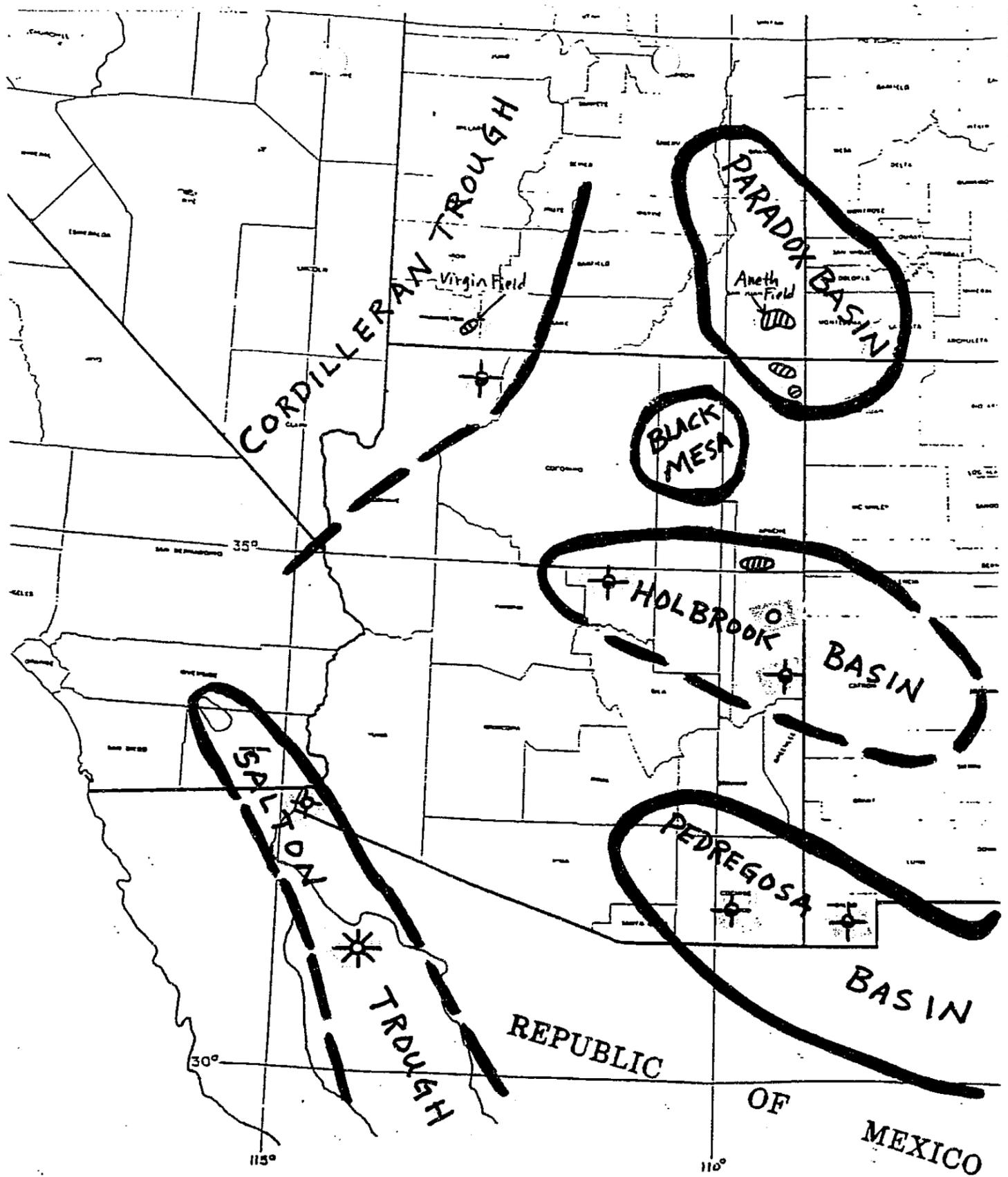


FIGURE 2. REGIONS WITH OIL AND GAS POTENTIAL IN ARIZONA AND ADJACENT STATES SHOWING SELECTED WELLS AND PRODUCING AREAS REFERRED TO IN TEXT



Fife Symington
Governor

State of Arizona
Arizona Geological Survey

845 North Park Avenue, #100
Tucson, Arizona 85719
(602) 882-4795



Larry D. Fellows
Director and State Geologist

Memo: Oil and Gas Conservation Commissioners

From: *SLR* Steven L. Rauzi, Oil and Gas Program Administrator

Date: March 3, 1995

Re: Potential incentive program for the State of Arizona

Two reports are attached. One, including an executive summary, documents oil and gas potential in Arizona. The other summarizes incentive programs in adjacent and other states.

Most of the incentive programs in adjacent states encourage companies to reinvest income from producing fields in those states on additional activity at or near the fields. At the same time, they discourage exploration and drilling in remote areas like Arizona where costs and risk are much higher than they are near the producing fields.

A potential incentive program for the State of Arizona, therefore, will be most effective if it helps defray the high cost and risk of exploring and drilling in Arizona.

Two potential incentives are suggested. They are modeled after legislation in adjacent states.

1. **No state severance tax or royalty on a discovery well.** Successive wells taxed on a sliding scale based on number of wells or price of oil.

This may spur drilling and result in a discovery. Successive wells may have better production than the first well, and will be taxed. The royalty clause may spur drilling on State Trust Land. Exemption on discovery well could be for 5 years, two times payout, or permanent.

2. **Tax credit from future production for move in/move out costs.**

This may spur drilling by helping to defray the cost of moving in expensive drilling equipment for deep wells. It could be set as a percentage of the total move in cost.

Since these incentives could not be realized unless a discovery is made and production is established, the State of Arizona has nothing to lose by adopting them. The benefits of a discovery include much more than severance taxes and royalties on a single well.



Fife Symington
Governor

State of Arizona
Arizona Geological Survey

845 North Park Avenue, #100
Tucson, Arizona 85719
(602) 882-4795



Larry D. Fellows
Director and State Geologist

Memo: **Oil and Gas Conservation Commissioners**

From: *SLP* Steven L. Rauzi, Oil and Gas Program Administrator

Date: March 3, 1995

Re: **Potential incentive program for the State of Arizona**

The attached draft reports summarize oil and gas potential in Arizona and incentive programs in adjacent and other states.

Most of the incentive programs in adjacent states encourage companies to reinvest income from producing fields in those states on additional activity at or near those fields. At the same time, they discourage exploration and drilling in remote areas like Arizona where costs and risk are much higher than they are near the producing fields.

A potential incentive program for the State of Arizona, therefore, will be most effective if it helps defray the high cost and risk of exploring and drilling in Arizona.

Two potential incentives are suggested. They are modeled after legislation in adjacent states.

1. **No state severance tax or royalty on a discovery well.** Successive wells taxed on a sliding scale based on number of wells or price of oil.

This may spur drilling and result in a discovery. Successive wells may have better production than the first well, and will be taxed. The royalty clause may spur drilling on State Trust Land. Exemption on discovery well could be for 5 years, two times payout, or permanent.

2. **Tax credit from future production for move in/move out costs.**

This may spur drilling by helping to defray the cost of moving in expensive drilling equipment for deep wells. It could be set as a percentage of the total move in cost.

Since these incentives could not be realized unless a discovery is made and production is established, the State of Arizona has nothing to lose by adopting them. The benefits of a discovery include much more than severance taxes and royalties on a single well.

OIL & GAS INCENTIVES LEGISLATION IN OTHER STATES

Copies of proposed or existing legislation to encourage exploration and drilling were requested from several states. The responses from Montana, Nevada, New Mexico, North Dakota, Oklahoma, South Dakota, Texas, Utah, and Wyoming are summarized in the list below. Colorado, Georgia, Idaho, Kansas, and Nebraska did not respond. Copies of the responses summarized below are on file in this office.

Most of the incentives are meant to preserve or enhance production from marginally producing wells and fields. They encourage secondary or tertiary recovery and drilling of horizontal wells through the use of tax holidays, reductions, rebates, or credits. The incentives encourage companies to reinvest income from producing fields on additional activity and drilling at or near those fields. At the same time, they discourage exploration and drilling in remote areas like Arizona, where costs and risk are much higher than they are near producing fields.

Any potential incentive program for the State of Arizona, therefore, will be most effective if it applies to any discovery well, regardless, and helps defray the high cost and risk of exploring and drilling in Arizona, which is very remote from existing production and oilfield sources of supply. Two potential incentives are suggested in the cover letter attached to this report.

SUMMARY OF EXISTING AND PROPOSED INCENTIVE LEGISLATION IN OTHER STATES

Georgia

Offers a \$250,000 bonus for the first well that produces 100 barrels a day for one year.

Montana

1. Reduced net proceeds and severance tax on incremental production from enhanced recovery projects beginning after 12/31/93 and before 1/1/02.
2. No net proceeds tax on production from horizontally completed wells for a period of 18 months.

This bill was specifically requested to accommodate two large enhanced recovery/horizontal well projects. More than 40 new horizontal wells were permitted as a result.

Nevada None

New Mexico

1. No severance tax for ten years on qualified production

restoration projects.

2. Severance tax reduced from 3.75% to 1.875% for production from qualified workovers exceeding a certified production projection for the project.
3. Severance tax reduced from 3.75% to 1.875% for production from enhanced recovery projects exceeding a certified production projection for the project.

The severance tax reduction for enhanced recovery projects has been in effect since January 1994. The severance tax reduction for qualified workovers and exemption for restoration projects was introduced in the first legislative session of 1995.

North Dakota

1. Wells drilled and completed after April 1987 are exempt from the 6.5% Oil Extraction Tax for 15 months.
2. Stripper wells (less than 10 barrels per day) are exempt from the 6.5% Oil Extraction Tax.
3. Qualified workovers are exempt from the 6.5% Oil Extraction Tax for 12 months. Workover cost must exceed \$65,000. Available as tax refund or credit.
4. Incremental production from qualified secondary recovery projects exempt from 6.5% tax for 5 years, incremental production from tertiary projects exempt for 10 years. Tax is reduced to 4% on nonincremental production for certain cases.
5. Pending legislation will expand the incentives to horizontal and inactive wells.

The North Dakota Oil and Gas Division reports that each type of incentive has been greatly utilized. It believes these tax incentives have had a positive impact on the oil industry in North Dakota.

Oklahoma

1. Incremental production resulting from secondary or tertiary recovery projects started after 7/1/93 and before 7/1/98 is exempt from the 7% gross value tax from project start date until payback is achieved but not exceeding 10 years.

2. Production from a horizontal well is exempt from the tax until payback or 2 years from initial production.
3. Production from inactive wells is exempt from the tax for a period of 28 months from the date production reestablished.
4. Production from qualified workovers or recompletions is exempt from the tax for 28 months from recompletion date.
5. Production from wells spudded between 7/1/94 and 6/30/97 and drilled to 15,000 feet or more is exempt from the tax from the date of first sales through a period of 28 months.
6. Pending legislation will provide for rebate of eligible monies in lieu of the tax credit now stipulated in the incentives.

The Oklahoma Oil & Gas Conservation Division reports it has been issuing orders under this program only since January 1. It has issued about 30 orders and processed 30 applications to drill wells greater than 15,000 feet. It believes it is too early to assess the success of the program.

South Dakota None

Texas

1. Severance tax on incremental production from enhanced recovery projects reduced by 50% for 10 years.
2. Production on wells inactive for three years is exempt from the severance tax for 10 years.
3. A \$10,000 per well severance tax credit for discoveries in 1994.
4. Production from new wells in marginal properties that equals existing production receive tax exemption vouchers (CHITS). CHITS are transferrable if property is sold.
5. TERRA program preserves shut-in wells for future use. Operators save 25% of plugging costs on wells put in program.
6. Production from wells using new technology developed in Texas or from qualified inactive or marginal leases receive a permanent exemption from severance taxes.

Items 4, 5, and 6 are proposed in the current legislative session. Legislation is also proposed to extend the tax credit for new discoveries and high cost gas.

The Railroad Commission of Texas, Oil and Gas Division reports the existing incentives are working very well for Texas and is confident the proposed incentives will enhance Texas's oil and gas industry.

Utah

1. No severance tax imposed on the first \$50,000 annually in gross income.
2. No severance tax imposed on the first 12 months of production from successful wildcat wells started after January 1, 1990.
3. Tax credit equal to 20% of recompletion or workover expense but not to exceed \$50,000 per well per year. Not to exceed \$30,000 from 1/1/95 to 12/31/99.

The Division of Oil, Gas, and Mining reports that the incentives have stimulated new drilling, workovers, and recompletions. Production has increased as a result.

Wyoming

1. Tertiary recovery receives a 2% reduction in severance tax for 5 years.
2. Stripper wells with less than 10 barrels per day receive 2% reduction in severance tax.
3. Wildcat wells receive 4% reduction in severance tax for 4 years.
4. Horizontal wells receive 4.5% reduction in severance tax for 5 years.
5. H.B. 288 to reduce severance tax by 4% for 2 years for first 40 barrels or the first 240 MCF/D. Workovers and recompletions receive same tax break with no production ceiling.

Pending legislation will extend tertiary and wildcat bills, redefine stripper as well producing less than 15 BOPD, raise limit from 40 to 60 BO and 240 to 360 MCF/D, and reduce severance tax by 4% for 2 years for wells shut in longer than 24 months.

The Wyoming Oil and Gas Commission believes that no single piece of legislation makes things happen, only a collection of relief as outlined above has real impact.

SUGGESTIONS FOR INCENTIVES FROM INDUSTRY

In addition to contacting several states about proposed or existing legislation, all companies with producing properties in Arizona and several companies and individuals that have recently leased land, drilled, or expressed interest in drilling in Arizona were contacted about suggesting potential incentives that would attract their attention.

None of the companies with producing properties in Arizona responded. The suggestions from the several companies that did respond are summarized below.

1. No state tax on new field discovery for 24 months.
2. Six months lease protection within 3 miles of a new discovery on state properties.
3. Two months lease protection after a permit is filed.
4. Guarantee an operator of a discovery the first right of refusal on property within three miles.
5. A reward or bonus for a discovery based on an amount per barrel of discovery oil such as \$5,000 per barrel.
6. Reduce ad valorem and severance taxes on first five years of production from a discovery well.
7. Reduce royalty on state leases for first five years of production.
8. Assistance in defraying extremely high costs of moving in equipment capable of drilling deep holes.
9. Reconsideration of legislation and regulations that add wasted cost to operation and liability costs.
10. Presentations at major prospect fairs such as were recently held in Denver and Houston.

OUTLINE FOR TALK

Evidence of oil and gas potential in Arizona

1. Current production.
2. Petroliferous rocks.
3. Surface seeps of tar.
4. Shows of oil and gas in many wells.
5. Large areas of untested sedimentary rocks (drilling density 1 well/100 mi²).

Six regions with best potential (Two maps for reference)

1. **Paradox Basin**
 - a. All current production.
 - b. Potential rated good to very good.
 - c. Navajo land.
 - d. Drilling depths moderate (4,000 to 6,000 feet).
2. **Holbrook Basin**
 - a. Past helium production, St. Johns, geothermal hole, shows in western part.
 - b. Potential rated good to very good.
 - c. State, federal, and private lands.
 - d. Drilling depths shallow to moderate (<4,000 to 6,000 feet).
3. **Arizona Strip**
 - a. Surface seeps, free oil reported in well test.
 - b. Potential rated good to very good.
 - c. Federal, state, and private lands
 - d. Drilling depths shallow to moderate (<4,000 to 6,000 feet).
4. **Yuma Basin**
 - a. Deep Exxon well, gas production in Pemex well.
 - b. Potential rated fair to good.
 - c. State, federal, and private lands.
 - d. Drilling depths moderate to deep (4,000 to >20,000 feet).
5. **Pedregosa Basin**
 - a. Petroliferous rocks, current leasing, well tests.
 - b. Potential rated fair to good.
 - c. Private, state, and federal lands.
 - d. Drilling depths moderate to deep (4,000 to >15,000 feet).
6. **Black Mesa Basin**
 - a. Coal reserves, oil shows in wells.
 - b. Potential rated good to excellent for coalbed methane.
 - c. Hopi, Navajo, Joint use lands.
 - d. Drilling depths shallow to moderate (500 to 6,000 feet).

DRAFT

ARIZONA HAS GOOD POTENTIAL FOR AN OIL AND GAS INDUSTRY

The State of Arizona has good potential for an oil and gas industry. Evidence of this potential includes current production, widely spaced petroliferous (having a strong odor of petroleum) rocks, surface seeps of oil, shows of oil and gas in many wells, and regions with thick layers of untested sedimentary rocks. Current production, as of January 1995, includes over 20 million barrels of oil and over 25 billion cubic feet of natural gas. Past production includes over 9 billion cubic feet of gas containing 8% helium. The evidence, therefore, shows that a future discovery of oil and gas in Arizona is not a matter of if, but where and when. Exactly where and when are predictable only in generalities. These are the focus of this report.

Evidence of oil and gas potential in Arizona is documented in information maintained by the Arizona Geological Survey in Tucson and the American Stratigraphic Company and Petroleum Information in Denver, Colorado. This evidence is available for study or purchase by any interested party and has been described and evaluated in several published reports by independent petroleum geologists, the Arizona Oil and Gas Conservation Commission, the Arizona Geological Survey, Arizona Geological Society, and the U.S. Geological Survey.

The key to finding more oil and gas in Arizona is simply to drill more wells. Two big hurdles to drilling in Arizona are the current low price of oil and the consequent reluctance of industry to drill wells in remote and relatively untested places like Arizona. According to an independent operator in Farmington, New Mexico, only about 1 in 200 companies are willing to drill such remote wells these days. Most companies are concentrating their exploration and drilling in low risk projects close to existing production and sources of supply, both domestically and overseas. Wells drilled in Arizona, on the other hand, are very remote from existing production and sources of supply. This drives up costs, dramatically in some cases, and increases risk.

Nevertheless, Arizona still has potential for an oil and gas industry. Even though companies are generally reluctant to drill wells in remote places like Arizona, from one to five requests are made to drill in Arizona every year. Obviously, the companies making these requests recognize the oil and gas potential of Arizona, in spite of the risks involved. Still, several regions in Arizona remain underdrilled. Why underdrilled? Because drilling density in Arizona is approximately 1 well per 100 square miles. It is 160 wells per 100 square miles in Utah, 500 wells per 100 square miles in Texas, and 600 wells per 100 square miles in Oklahoma.

Seeps, petroliferous rocks, and oil shows in wells

Surface seeps, petroliferous rocks, and shows of oil and gas in many wells document the presence of oil and gas in surface and subsurface rocks of Arizona. Surface seeps

are present in several areas of collapsed rock (breccia pipes) in northwestern Arizona where they are characterized by tar in fractures and oil-impregnated rocks. These breccia pipes extend from the surface downward into Mississippian rocks, which are considered by some investigators to be the source of the tar found in the pipes. Other investigators have suggested that Precambrian rocks, possibly the highly petroliferous Chuar Group exposed in eastern Grand Canyon, are the source of the tar found in the breccia pipes.

Petroliferous rocks are present in Precambrian rocks in Grand Canyon, in Devonian rocks along the Mogollon Rim, and in Tertiary and Paleozoic rocks in many areas in southeastern Arizona. These petroliferous rocks are characterized by a strong odor of petroleum on freshly broken surfaces.

Well files maintained by the Arizona Geological Survey and interpretive geology logs maintained by the American Stratigraphic Company in Denver document the reported shows of oil and gas in many wells in several regions of the state. Most shows are described as oil stains on grains or in fractures, as tar globules or fluorescence in drilling mud or on rock fragments, or as blows or bubbles of gas in drilling mud. Stronger shows are described as films or rainbows on drilling mud, as oil bleeding from fractures, or as residual or dead oil in pores of the rock. The strongest shows are reported as free oil and oil-cut mud recovered from tests performed as the wells were being drilled or shortly after being drilled.

Surface seeps, petroliferous rocks, and shows of oil and gas in wells are evidence of the existence of rocks capable of generating oil and gas and the migration of the oil and gas through the rocks at some point in the past. If oil has migrated through subsurface rocks in the past, there is a good chance it has accumulated in a subsurface trap as well. The trick is in finding the trap, and the best way to do that is to drill wells in favorable areas. If there is anything the State of Arizona can do to help get these wells drilled, it should definitely do so.

Favorable stratigraphy

Rock sequences likely to contain oil and gas are considered "favorable stratigraphy." Favorable stratigraphy includes thick accumulations of untested sedimentary rocks containing organic-rich layers capable of generating oil and gas (source rocks), and porous layers capable of holding commercial accumulations of oil and gas (reservoir rocks). Oil and gas are trapped in porous layers when impermeable layers, such as shale, seals the porous layers over folds or when porous layers grade laterally into impermeable layers. Favorable stratigraphy is present in several underdrilled regions of Arizona. Drilling density in Arizona as a whole and the Holbrook Basin is close to 1 well per 100 square miles, for the Black Mesa and Pedregosa Basins it is closer to 1

well per 250 square miles.

REGIONS WITH GOOD OIL AND GAS POTENTIAL IN ARIZONA

The rest of this report focuses on six regions in Arizona considered to have the best potential for future discoveries of oil and gas (Figure 1). Each region contains favorable stratigraphy including potential source and reservoir rocks. Each region contains either seeps, petroliferous rocks, or wells with shows of oil or gas. Some regions contain all three. One already has oil and gas production. It will be from one of these regions where the future "discovery" of oil and gas in Arizona will be, the only remaining question is when.

Paradox Basin

The northeastern corner of the state includes the southernmost part of the Paradox Basin, most of which lies in southeastern Utah (Figure 2). This basin contains favorable stratigraphy and is the location of all current production in Arizona. The giant Aneth oil field, just north of the Utah line, has produced over 385 million barrels of oil. The Mexican Hat Field, also in southeastern Utah, is noteworthy because it documents shallow oil production from rock layers folded into a trough (synclinal fold).

The approximate oil and gas reserves per well in the producing fields of northeastern Arizona are well established. Reserves at Walker Creek Field are about 100,000 barrels of oil per well. Reserves are about 160,000 barrels of oil per well at Dry Mesa Field and about 500,000 barrels of oil per well at Dineh-bi-Keyah Field. Gas reserves at Black Rock Field are about 1 billion cubic feet of gas per well. This range of approximately 100,000 to 500,000 barrels of oil per well and 1 billion cubic feet of gas per well provides a reasonable minimum estimate of potential reserves of oil or gas per well from a future discovery in Arizona.

Potential of the Paradox Basin in Arizona is considered very good. Existing production in this region may be enhanced considerably through the use of horizontal drilling technology or secondary recovery methods such as water or carbon dioxide flooding. Several states, in fact, have adopted incentive programs to stimulate these types of projects to enhance production. All land in this region is part of the Navajo Reservation. Drilling depths are moderate, ranging from 4,000 to 6,000 feet.

Holbrook Basin

The Holbrook Basin is in east-central Arizona (Figure 1). It contains favorable stratigraphy and may be an extension of the prolific Permian Basin of west Texas.

The Holbrook Basin, like the Paradox Basin, contains salt and gypsum which are commonly associated with oil and gas production in many parts of the world. Nearly 740 million cubic feet of helium were produced in the northeastern part of the Holbrook Basin in the 1960's and 1970's (Figure 1).

In August 1994, a well drilled in the east-central part of the Holbrook Basin, about 7 miles southeast of St. Johns, was announced as a potential carbon dioxide and helium gas discovery (Figure 1). A test of the producing interval yielded 640,000 cubic feet of 90% carbon dioxide and .6% helium per day. Current activity at this area is concentrating on delineating and exploiting the potential reserves of carbon dioxide and helium. It is quite possible that oil and natural gas will be found if drilling in the St. Johns area continues.

Oil bleeding from vertical fractures was reported in a well drilled in the southeastern part of the Holbrook Basin in the summer of 1993 (Figure 1). A geochemical study shows that even though the rocks penetrated in this hole have not been buried deeply enough to reach the peak of their oil generating potential, their remaining potential to generate liquid petroleum products is high. Organic-rich rocks deeper than the rocks penetrated in the hole may, therefore, have excellent potential to generate oil and gas.

Oil shows in a well in the western part of the Holbrook Basin were reported as uniformly staining the rock surface (Figure 1). Oily scum was reported on residue of carbonate rock dissolved in acid. These shows document the past migration of oil through subsurface rocks in this part of the Holbrook Basin.

Potential of the Holbrook Basin is considered good to very good. State, federal, and private lands are available for leasing. Drilling depths are shallow to moderate, ranging from less than 4,000 to 6,000 feet. Drilling density is about 1 well per 100 square miles.

Arizona Strip

The Arizona Strip, in northwestern Arizona between Grand Canyon and Utah (Figure 1), contains favorable stratigraphy grading from rocks of shallow marine origin on the east to thick, deeper marine rocks on the west. Surface seeps of tar in fractures are present in several breccia pipes in the Arizona Strip. Many wells have reported shows of oil. A test in one of these wells (Figure 1) recovered 20 feet of oil and 70 feet of oil-cut mud in the drill pipe.

Very little ground water exists in the Arizona Strip and subsurface pressures are low. As a result, unique approaches to locating and drilling for oil are required. Oil may very well have accumulated in synclinal folds or down-dip areas like it has in the

Mexican Hat Field in southeastern Utah.

Potential of the Arizona Strip is considered good to very good. Land available for leasing in this region is mostly federal but scattered tracts of state and private land are present. Drilling depths are shallow to moderate, ranging from less than 4,000 to 6,000 feet. Drilling density is about 1 well per 135 square miles.

Yuma Basin

The Yuma Basin is in the southwestern corner of Arizona (Figure 1). It contains an exceptionally thick sequence of Tertiary sedimentary rocks, which thicken to the south in the northern part of the Gulf of California. Exxon drilled a well to a total depth of 11,400 feet in the Yuma Basin in 1973 (Figure 1). Even at 11,400 feet, the Exxon well had not reached the base of the Tertiary sediments. Pemex drilled a well to the south in the northern Gulf of California to a total depth of 16,400 feet without reaching the base of the Tertiary sediments (Figure 2). The Pemex well flowed 5.7 million cubic feet of gas per day at a depth of 13,500 feet. These producing Tertiary sediments may extend northward into Yuma Basin.

Potential of the Yuma Basin is considered fair to good. State, federal, and private lands are available for leasing. Federal land in this part of Arizona includes the Barry M. Goldwater Aerial Gunnery Range which may hold potential for oil and gas, but which is currently withheld from oil and gas exploration by the federal government. Drilling depths are moderate to deep, ranging from 4,000 to 20,000 or more feet.

Pedregosa Basin

The Pedregosa Basin in southeastern Arizona contains favorable stratigraphy including thick accumulations of Paleozoic and Cretaceous rocks of marine origin (Figure 1). Thick, Tertiary sediments fill broad valleys, some of which contain gypsum deposits.

Petroliferous rocks are present in the Tucson, Whetstone, Dragoon, and Chiracahua Mountains. A test in a well southeast of Tombstone (Figure 1) recovered 450 feet of oil-cut mud. Shows also were reported in wells near Douglas and San Simon. A lease play (a speculative accumulation of leases) involving over 40,000 acres of federal, state, and private land is currently taking place in the broad valley centered around San Simon. In 1958, Humble Oil Company drilled a well to a depth of 14,500 feet in the Pedregosa Basin in southwestern New Mexico (Figure 2). This well had gas shows from 4,190 to 4,219 feet.

The Pedregosa Basin, like the other basins in this report, remains underdrilled. Very few wells in this basin have tested the Paleozoic and Cretaceous rocks underlying the broad valleys filled with Tertiary rocks. Coalbed methane gas was reported in a well

south of Douglas in Mexico. Fairly large accumulations of oil and gas may exist in these untested Paleozoic and Cretaceous rocks.

Potential of the Pedregosa Basin is considered fair to good. The potential size of oil or gas accumulations in Paleozoic or Cretaceous rocks below the Tertiary fill in the broad valleys could be quite large. Interstate oil and gas pipelines cross the region and would provide a ready-made outlet for such accumulations. Private, state, and federal lands are available for leasing. Drilling depths are moderate to deep, ranging from 4,000 to 15,000 or more feet.

A major hurdle to drilling deep test wells in the Pedregosa Basin, as in the Yuma Basin, is the extremely high cost of moving in drilling equipment capable of deep drilling. Any incentives to help offset this cost would go a long way in stimulating exploration and the consequent development of an oil and gas industry in Arizona.

Black Mesa Basin

Most of the Black Mesa Basin in northeastern Arizona is within the Navajo-Hopi joint use area (Figure 1). It contains an estimated 21 billion tons of coal reserves, only one billion tons of which are classified recoverable. The remaining 20 billion tons of coal, at depths between 300 and 1,700 feet, hold excellent potential for coalbed methane.

Potential for coalbed methane in the Black Mesa Basin is considered very good to excellent. Potential for oil and gas is considered good to very good. This region, however, like the Paradox Basin, is probably beyond the influence of the state to assist in stimulating exploration and development. All land in this region is part of the Navajo or Hopi Reservations. Most of the land in the Black Mesa Basin is within the Navajo-Hopi joint use area. Drilling depths for coalbed methane are shallow, ranging from 500 to 2,000 feet. Drilling depths for oil and gas are moderate, ranging from 4,000 to 6,000 feet.

CONCLUSION

In conclusion, the State of Arizona has good potential for a future discovery of oil or gas. Evidence of this potential includes current production, widely-spaced petroliferous rocks, oil seeps, and shows of oil and gas in many wells. Six basins in Arizona are considered to have the best potential for this future discovery of oil and gas. The only remaining question is when.

S.L. Rauzi, 3/3/95

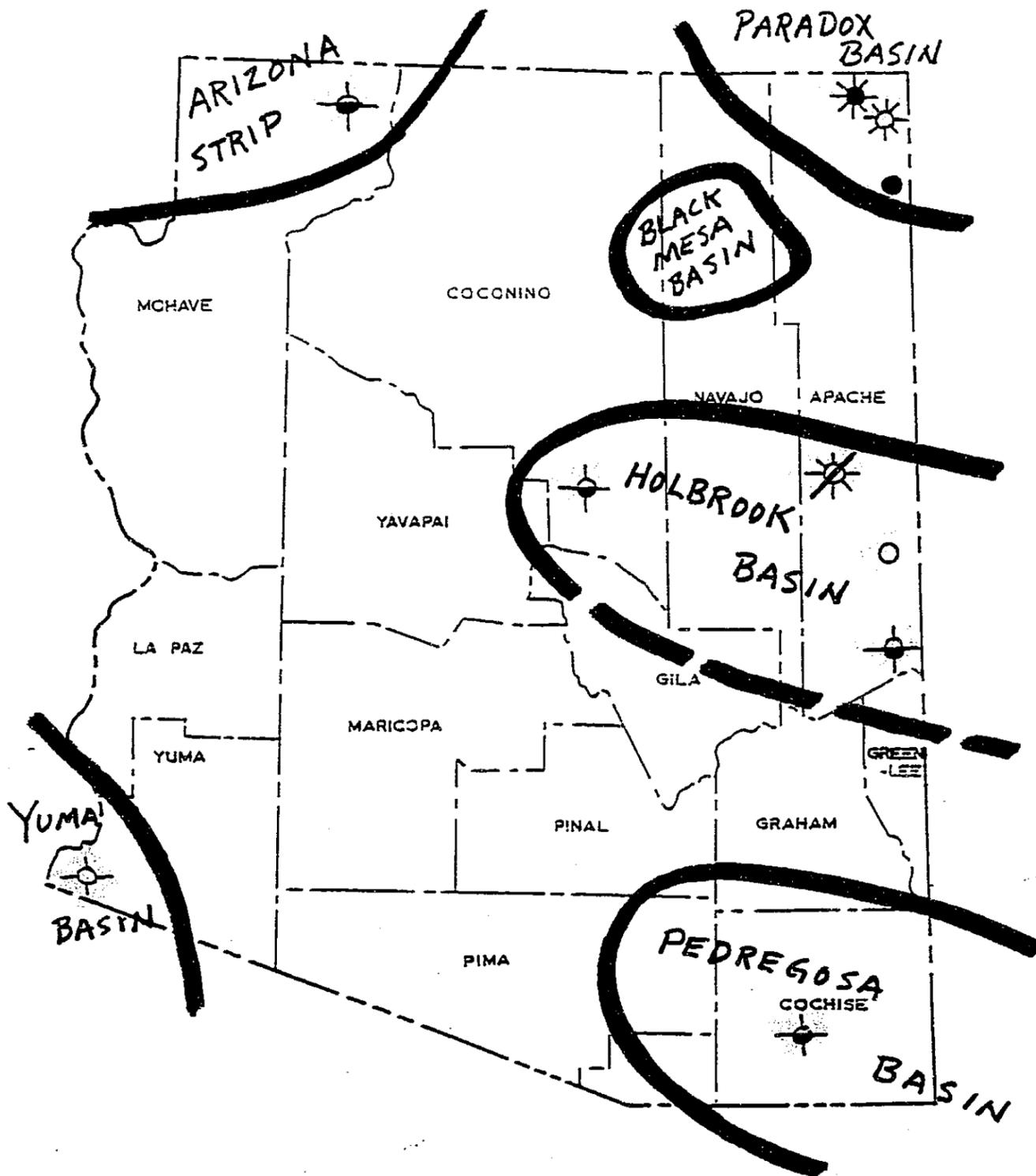


FIGURE 1. REGIONS WITH OIL AND GAS POTENTIAL IN ARIZONA

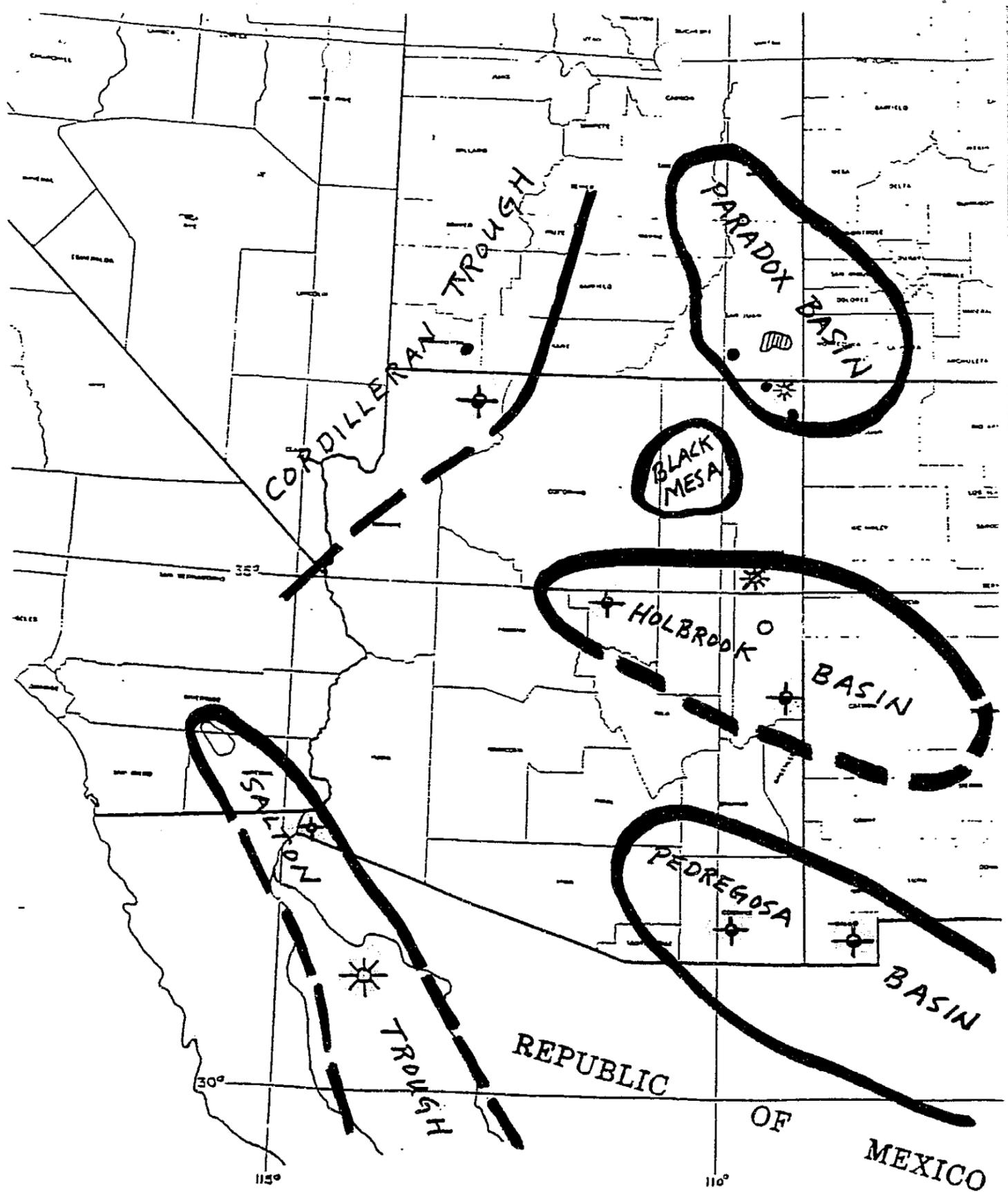


FIGURE 2. REGIONS WITH OIL AND GAS POTENTIAL IN ARIZONA AND ADJACENT STATES



Fife Symington
Governor

State of Arizona
Arizona Geological Survey

845 North Park Avenue, #100
Tucson, Arizona 85719
(602) 882-4795



Larry D. Fellows
Director and State Geologist

March 7, 1995

Mr. Akhtar Zaman
Navajo Nation Mineral Department
P. O. Box 1910
Window Rock, Arizona 86515

Dear Akhtar:

As I mentioned in our conversation this morning, the Commission cannot discuss a matter unless that matter is identified on an agenda. For this reason, I included item 5 on the agenda for the March 17 meeting of the Oil and Gas Conservation Commission. Up to this point, the Commission has requested the BLM to prepare a draft copy of an agreement between it and the BLM to eliminate unnecessary duplication of effort and provide for sharing of data on oil, gas, and geothermal wells drilled in Arizona. John Haas of the BLM's Office in Phoenix has indicated to me that he was going to gather input from the BLM Office in Farmington and from you. At its last meeting, the Commission tabled further discussion on this matter until such time that a draft copy is ready. Other than that, I have no background material available on this agenda item.

A copy of the background material for agenda item 6 is enclosed. The Commission, in considering ways to stimulate activity in Arizona, instructed me to investigate what types of incentive programs, if any, are in place in adjacent and surrounding states and to prepare a summary of the potential for additional discovery of oil and gas in Arizona. The enclosed background material is the result of my investigation on this matter.

Sincerely,

Steven L. Rauzi
Oil & Gas Program Administrator

Enclosures



Fife Symington
Governor

State of Arizona
Arizona Geological Survey

845 North Park Avenue, #100
Tucson, Arizona 85719
(602) 882-4795



Larry D. Fellows
Director and State Geologist

January 27, 1995

Mr. Clarence Bigelow
Apache County Manager
P. O. Box 428
St. Johns, Arizona 85936

Re: Ridgeway Arizona Oil Corporation #3-1 State
Sec. 3, T. 11 N., R. 29 E.
State Permit #884

Dear Mr. Bigelow:

A copy of the approved application to drill the referenced well in Apache County is enclosed for your information.

It is the policy of the **Arizona Oil and Gas Conservation Commission** to provide this information to the County Manager of the County in which the well is located in order to keep local governments informed on exploration drilling efforts in Arizona.

The Commission issues a permit to drill pursuant to A.R.S. § 27-516 after it has determined that drilling of the well is in compliance with the rules of the Commission (*Arizona Administrative Code* Title 12, Chapter 7) and that public health and safety, correlative rights, and subsurface resources will not be compromised.

Please do not hesitate to contact me if I may be of any assistance.

Sincerely,

Steven L. Rauzi
Oil and Gas Program Administrator

Enclosures



Fife Symington
Governor

State of Arizona
Arizona Geological Survey

845 North Park Avenue, #100
Tucson, Arizona 85719
(602) 882-4795



Larry D. Fellows
Director and State Geologist

January 27, 1995

Dr. J. Dale Nations, Chairman
Oil and Gas Conservation Commission
P. O. Box 4099
Flagstaff, Arizona 86011

Dear Dale:

A copy of the Commission's January 20 minutes are enclosed for your review and signature. A self-addressed, stamped return envelope is also enclosed for your convenience in returning the signed minutes.

Sincerely,

A handwritten signature in cursive script that reads "Steve".

Steven L. Rauzi
Oil & Gas Program Administrator

Enclosures



Norcross

Securities Inc.
Investment Bankers

January 24, 1995

Mr. Joseph Lane
Executive Assistant
Office of the Governor
1700 West Washington
Phoenix, Arizona 85017

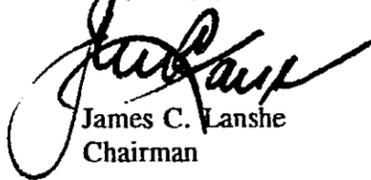
Dear Joe:

This letter is written following our brief telephone conversation of yesterday. Specifically, the Oil and Gas Commission is in the process of completing a presentation for use in discussing with the Governor a potential incentive program for the State of Arizona similar to those found in adjacent states.

As I mentioned to you, both the chairman of the commission and Larry Fellows would participate in such a presentation to be held sometime after March 17, as may be convenient for you and the Governor. Also, I will supply you with a rough draft of the discussion points prior to that time so that you can be fully apprised of all issues under consideration.

In the meantime, please do not hesitate to call on me in the event you may have any questions with respect to this matter. Thank you again for all of your kind cooperation.

Very truly yours,



James C. Lanshe
Chairman

JCL:ja

cc: Chairman J. Dale Nations
Mr. Larry D. Fellows
Mr. Steven L. Rauzi

645 East Missouri Avenue, Missouri Falls Bldg., Phoenix, Arizona 85012 Phone: (602) 234-5555 Fax: (602) 230-7455

MEMBER PACIFIC STOCK EXCHANGE • NASD • SIPC • SIA

Guests @ Oil & Gas Meeting - March 17, 1995

John Haas BLM
Jon Fiegen A.G.