

OIL & GAS CONSERVATION COMMISSION
MINUTES OF MEETING - JANUARY 14, 1994 -
STEVEN L. RAUZI, PROGRAM ADMINISTRATOR

32X11



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 January 14, 1994, 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 Minutes of Meeting and Executive Session of August 20, 1993.
3. Welcome new Commission Member
4. Statement of Director and State Geologist
5. Report of Oil & Gas Program Administrator
6. Status of #1 Alpine-Federal geothermal well
7. Permitting procedures
8. Contender Oil Company bond
9. Assistant Attorney General report on status of Power Ranch geothermal wells
10. Developments in Navajo Nation
11. Call to the public
12. Announcements
13. 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 30th day of December 1993.

OIL AND GAS CONSERVATION COMMISSION

Steven L. Rauzi
Oil and Gas Program Administrator



Fife Symington
Governor

State of Arizona
Arizona Geological Survey

845 North Park Avenue, #100
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Dated this 30th day of December 1993.

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



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

December 30, 1993

TO: Oil and Gas Conservation Commissioners
FROM: ^{SLR} Steven L. Rauzi, Oil and Gas Program Administrator
SUBJECT: Activity Report for January 14, 1994, Meeting

Governor Symington appointed Lisa C. Worthington to the Commission on July 2, 1993. She is replacing Barbara H. Murphy.

The minutes of your last meeting on August 20, 1993, were mailed to you shortly after that meeting so they are not enclosed. Please let Pam or me know if you would like another copy of these minutes.

The Alpine-Federal 1 geothermal hole north of Alpine is shut-in. Letters from John Sass, U.S. Geological Survey, and John Mock, Department of Energy, concerning this well are enclosed for your review. Sass indicated that Thomas Moses, U.S. Geological Survey, Menlo Park, and Fritz Gorham, Department of the Interior solicitor general, Phoenix, plan to attend the January 14 meeting to talk about transferring responsibility of the well from Tonto to the USGS. Of special note is that the Alpine hole had shows of oil in the Permian Supai Formation. The shows indicate that the extensive basaltic volcanism of the area has not been detrimental to the hydrocarbon potential of the Permian rocks and suggest that units underlying the Permian also may have hydrocarbon potential.

Concerning the background material for the agenda item on permitting procedures, I do not see how requiring public notice and hearing for a well within x miles of a community will provide more protection than is currently provided by your existing rules, which have been promulgated through the open-meeting process. As pointed out in the Chairman's letter of February 4, 1993, the Commission's rules are consistent with surrounding states.

The Arrowhead Oil and Gas SunCor-Melange #32-23 well location near Litchfield Park was restored to the satisfaction of our rules and the landowner in August. Their bond was released on September 3, 1993.

Kerr-McGee plugged the Navajo B-1 at the Dineh-bi-Keyah Field in October. The well never did produce but was not plugged because they planned to use it as an injection well in a

Activity Report for January 14, 1994, Meeting
December 30, 1993
Page 2

future water flood project at the field. However, they decided to plug the well after it failed a recent mechanical integrity test. I witnessed the plugging of this well.

Keith Gibbs requested information and forms because he was thinking about buying some producing wells in Arizona. He did not say which wells but both Dry Mesa (to Chuska Energy as discussed at the hearing during your last meeting) and Kerr McGee have indicated a desire to sell their producing wells. Kerr McGee recently requested information on procedure if they sold the Dineh-bi-Keyah Field. Shortly after Kerr McGee's request, Manhattan Oil Company requested verification of Kerr McGee's producing wells. However, I have not received any written notification of actual sales of wells since these initial contacts.

The Amerigas and Ferrellgas LPG-storage facilities were inspected and were in good condition in November. It was a banner year for Ferrellgas, they had more product in storage in 1993 than in any previous year. They hope to have a new brine pond built by summer of 1994.

I will have Contender Oil Company's certificate of deposit at the meeting for the Chairman to endorse for subsequent deposit into the Oil and Gas Conservation fund. Apparently, the Department of Water Resources is not able to work out an access agreement to the well with the new property owner. Therefore, we will have the well plugged and abandoned as soon as we get legislative appropriation to do so. Larry will advise of the procedure and status of this appropriation.

The Attorney General certified the repeal of R12-7-193 and R12-7-195 on September 22, 1993, and these rules were removed from the *Arizona Administrative Code* in the 93-3 supplement. I have received no word on the second and third groups of rules. In other rule-related developments, the Arizona Department of Environmental Quality is seeking Underground Injection Control (UIC) Primacy from the U.S. Environmental Protection Agency. Their legal assistant in the UIC Primacy Project, Joan Salvatierra, called to discuss the project with me and requested a copy of our rules on Class II injection wells. I sent her a copy of the injection rules that you adopted in March 1993 with a note that they are still being reviewed for certification by the Attorney General. I also sent her a copy of a letter dated November 17, 1987, in which ADEQ advised EPA that Class II injection wells were regulated by the Oil and Gas Conservation Commission and would continue to be regulated by the Commission in the UIC Program.

Some graphs of posted prices for Four Corners sweet crude are enclosed for your information. The price dropped to below \$14/barrel for the first time since October 1988 and has caused oil companies to reexamine their spending plans for 1994. Many of the plans were based on \$18-20/barrel oil and in one report, Phillips was including oil as low as \$13/barrel in its forecasting. The Independent Petroleum Association of America reported that the low oil price threatens production from marginally producing wells, which account for almost one-fourth of U.S. oil output.

Contacts from OGJ report

- 1- Wallace Bayne
Merrion Oil & Gas interested in geochemical analyses, maturation studies, migrated vs. in situ oil. Send sample policy + add to AZGEOL
- 2- Ed Marker
P.I. additional studies available, new pub mailing list? add to AZGEOL
- 3- Norun Paatup
Paatup Oil Ltd. details, additional studies, oil & gas + topo maps. send pub list + give Wrucke reference.
- 4- Brennan details, is working up plays eastern AZ + western NM. send NJ maps.
- 5- Frank Turner calling for Floyd Moulton. Working up Great Basin plays, may extend south into AZ. Hunt well @ 8000 in Cambrian. PE start below E. hope to encounter nugget twice. \$10 million budgeted. Seismic activity + leasing play in western UT. pipeline driven. Moulton talk on play to AGS? 1-800-264-4645.
6. Humble Geochem Serv. wish to do geochem @ no charge.
7. RE. Zimmerman discuss details, had large lease block: 1-75+2-9W NM and 6-8N + 27-31 E AZ. Shell drilled on his block in NM. Was Shell seismic call when OFZ ready. Suggest call to Dr. Bruce Black, Farmington 505-325-9671. His son has office in Denver.

Office of the Governor of the State of Arizona

To all to whom these Presents shall come Greeting:

*I, Fife Symington, Governor of the State of Arizona in the name of
and by the authority of said State, do Commission and Authorize*

LISA C. WORTHINGTON

to be a member of the

OIL & GAS CONSERVATION COMMISSION

*and to discharge, according to law, the duties of said office, and
to hold and enjoy the same, together with the powers, privileges and
emoluments thereunto appertaining, until the legal termination thereof,*



*IN WITNESS WHEREOF I have hereunto set my
hand and caused to be affixed the Great Seal of
Arizona done at the Capitol in the City of
Phoenix, this twentieth day of July in the
year of our Lord, One Thousand Nine Hundred
and Ninety Three.*

Fife Symington
GOVERNOR

Attest: *Richard Habonay*
Secretary of State

DATE: September 3, 1993
TO: Oil and Gas Conservation Commissioners
FROM: Steven L. Rauzi, Oil and Gas Program Administrator
SUBJECT: Signed documents from your meeting and the hearing on August 20, 1993

I have enclosed the Minutes of Meeting and the Executive Session Minutes from your meeting of August 20, 1993. Normally, these would be enclosed with the agenda material that is mailed to you two weeks before your next regularly scheduled meeting. However, you have scheduled your next meeting for January 14, 1994, and I thought it would be good to mail the minutes at this time while the meeting of August 20, 1993, is still fresh in mind.

I have also enclosed a copy of Order 62. Please note that, as you so ordered in the hearing on August 20, 1993, the mechanical integrity test requirement in Order 58 was amended from requiring the test on an annual basis to requiring the test at least once every two years.

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

Minutes of Meeting
August 20, 1993

Present:

Mr. James E. Warne, Jr., Vice-Chairman
Dr. J. Dale Nations, 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 August 20, 1993, was called to order by Mr. James E. Warne, Jr., Vice-Chairman, at 10:00 a.m. in Room 500, State Capitol Tower, Phoenix, Arizona.

HEARING ON APPLICATION TO AMEND PERMIT FOR INJECTION WELL AT DRY MESA FIELD

At 10:05 a.m., the hearing on Dry Mesa Corporation's requested amendments to its disposal well in the Dry Mesa Field started. Minutes for that hearing are presented separately.

APPROVAL OF MINUTES OF MEETING AND OF THE EXECUTIVE SESSION OF MARCH 12, 1993

Dr. Nations moved, seconded by Mr. Veale:

THAT THE MINUTES OF THE MEETING AND OF THE EXECUTIVE SESSION
OF MARCH 12, 1993, BE ACCEPTED AS PRESENTED

Motion carried unanimously.

STATEMENT OF DIRECTOR AND STATE GEOLOGIST

Dr. Fellows reported that he is busy closing the fiscal year that ended on June 30, assigning projects for the coming year, and preparing the annual report for fiscal year 1992-93. He is also working on the fiscal year 1994-95 budget.

Dr. Fellows reported that the bulk of the core from the Tertiary section in the well being cored near Alpine will be on permanent loan to the New Mexico Bureau of Mines and Mineral Resources in Socorro where they have a nice core storage facility and a couple of staff people actively working on the upper part of the hole. He advised that all of the core below the Tertiary will be stored at our repository plus a sampling of the upper part and noted that all other cores in our repository have been skeletonized. Dr. Nations was concerned about the lack of adequate core storage space in Arizona. Dr. Fellows advised that our sampling from the Tertiary exceeds the minimum required by rule and that we do not have a budget to pay for excessive core storage. He noted that to date there has been very little demand for research on the core we do have stored.

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 updated the Commissioners on the Alpine-Federal #1 well and advised that the operator of the well planned to request observational status for up to two years and that the U.S. Geological Survey desired to assume the responsibility for the well and deepen it into Precambrian rocks. The Commission agreed in principle to the change of status and transfer of responsibility to the U.S Geological Survey but would not make a final decision until the issues of posting a bond, the assumption of responsibility, and the setting of a specific time frame for deepening or plugging the hole are resolved by some sort of written agreement.

Mr. Rauzi reported that the Sunbelt Refinery near Coolidge would cease operations by August or September. Sunbelt planned to mothball the refinery until asphalt prices firm and ongoing environmental litigation is resolved.

Mr. Rauzi reported that PB-KBB plans to run a sonar caliper log to verify the volume of cavern 1 at the Amerigas LPG-storage facility early next year. PB-KBB advised him that it is becoming increasingly difficult to get a sonar caliper run since there are only four small companies that run them. They asked the Commission to consider the interface-volume method as an alternative to the sonar caliper and indicated to Mr. Rauzi that they would send him a summary of this method so that he could present it to the Commission for their consideration.

Mr. Rauzi reported that he is still waiting to hear from Ms. Clark on their discussions on the second set of rules. He discussed the third set with Mr. Fiegan and will be sending the resulting changes to the Commissioners for approval as soon as he hears back from him. Mr. Dulsky added that the third set looked fine and he expected them to be certified quickly unless Ms. Stewart had changes.

CLOSE RECORD AND REPEAL A.A.C. R12-7-193 AND R12-7-195

No oral proceedings were scheduled on the repeal of these two rules and Mr. Rauzi reported that no written comments were received. The closing date for written comments was July 30, 1993.

Mr. Veale moved, seconded by Dr. Nations:

THAT THE COMMISSION CLOSE THE RECORD, ADOPT THE CONCISE EXPLANATORY STATEMENT, AND REPEAL R12-7-193 AND R12-7-195 SUBJECT TO CERTIFICATION BY THE ATTORNEY GENERAL

Motion carried unanimously.

Mr. Warne signed the documents on these two rules and Mr. Rauzi advised that he would forward the two rules to the Attorney General.

DISCUSS FORFEITURE OF CONTENDER OIL COMPANY BOND

Mr. Rauzi discussed getting the Aman #1 well plugged with the \$5,000 bond and reported that he wrote to Contender Oil Company and asked them to voluntarily forfeit their bond. His letter was returned unopened. He reported that the Arizona Department of Water Resources is interested in

using the well as an observation well. They will accept responsibility for it if the Commission will transfer the bond money with the well and if they could work out an access agreement with the land owner. Since the property is being sold, the Department of Water Resources will need to wait until the sale is finalized before working out the access agreement.

Dr. Nations moved, seconded by Mr. Veale:

THAT THE COMMISSION FORFEIT THE CONTENDER OIL COMPANY BOND
FOR NONCOMPLIANCE WITH RULES AND STATUTES

Motion carried unanimously.

ASSISTANT ATTORNEY GENERAL REPORT ON CONTENDER AND POWER RANCH
WELLS

Dr. Nations moved, seconded by Mr. Veale:

THAT THE COMMISSION GO INTO EXECUTIVE SESSION

Motion carried unanimously. At 11:10 a.m., the Executive Session began.

The regular meeting resumed at 11:46 a.m.

ELECTION OF OFFICERS

Mr. Warne moved, seconded by Mr. Veale:

THAT DR. NATIONS BE NOMINATED CHAIRMAN

Motion carried unanimously.

Mr. Veale moved, seconded by Dr. Nations:

THAT MR. WARNE BE NOMINATED VICE-CHAIRMAN

Motion carried unanimously.

CALL TO THE PUBLIC

None.

ANNOUNCEMENTS

The next meeting was scheduled for January 14, 1994, in Room 500 of the Capitol Tower.

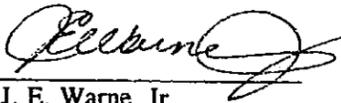
ADJOURNMENT

Dr. Nations moved, seconded by Mr. Veale:

THAT THE MEETING BE ADJOURNED

Motion carried unanimously. Time of adjournment was 12:00.

APPROVED



Mr. J. E. Warne, Jr.
Vice-Chairman

GUESTS IN ATTENDANCE:

Beryl I. Dulsky
Barry A. Wieland
Kent L. Carter
Renee Bahl
Melodie Jones

Attorney General's Office
Chuska Energy Company
McFate Reporting Service
JLBC
OSPB

Geothermal test hints at oil potential in eastern Arizona volcanic field

Steven L. Rauzi *Arizona Geological Survey Tucson*

A recently drilled geothermal well, funded by the U.S. Department of Energy and the Arizona Department of Commerce, has provided information about the geology of east-central Arizona and west-central New Mexico.

Tonto Drilling Services in cooperation with New Mexico State University completed the well, the 1 Alpine-Federal, at a total depth of 4,505 ft on Aug. 29, 1993. The well is located among volcanic rocks in the Apache-Sitgreaves National Forest about 6 miles north of the town of Alpine and 6.2 miles west of the Arizona-New Mexico line in 23-6n-30e, Apache County (Fig. 1). Ground elevation at the wellsite is 8,556 ft.

The well was drilled to determine the hot dry rock geothermal potential of Precambrian rocks. The operator expected to penetrate Precambrian at about 4,200 ft, but the hole was still in Permian rocks at that depth and was in a mafic dike that intruded the Permian rocks at the total depth of 4,505 ft.

Thus the well did not provide any information about the depth and nature of the Precambrian rocks or the presence, thickness, and hydrocarbon potential of Pennsylvanian, Mississippian, or Devonian rocks.

The hole did, however, show that Cretaceous and Permian strata contain potentially important source rocks for oil and gas that are apparently unaffected by nearby volcanism. These po-

tential oil source rocks are the focus of this article.

Stratigraphy

The 1 Alpine-Federal, cored from 500 ft to total depth, penetrated Tertiary, Cretaceous, and Permian rocks (Fig. 2). The Permian rocks were cut by three mafic dikes.

The operator reported the Tertiary Datil formation at the surface, Eocene Baca formation at 1,093 ft, early Tertiary redbeds at 3,139 ft, Cretaceous rocks at 3,260 ft, Permian San Andres limestone at 3,369 ft, Permian Glorieta sandstone at 3,436 ft, and Permian Yeso (Supai) formation at 3,751 ft.

H. Wesley Peirce, in an initial inspection of the core with the author, identified the Fort Apache member of the Yeso formation from 4,224-4,414 ft. The Fort Apache member is cut by a mafic dike from 4,260-4,360 ft. The dike apparently did not alter these sediments to any appreciable extent, the widest baked zone being less than 3 in.

Tertiary strata

The Tertiary strata in the 1 Alpine-Federal consist of tuffaceous clastic rocks ranging from dense mudstone

and well and sand conglomerate reported in casts and vases. A finer grain top of the was packed with presence of conglomerate.

Cretaceous

The Cretaceous which resandstone to light gray quartzose dense dark mudstone between and dark sandstone.

The angle of some instead. The sand and trap places. The gets prog and more of.

The operator reported the Cretaceous including organic source rock what looked like the top of.

Permian

The San Andres in the 1 Alpine-Federal medium dark limestone. dark, laminated with black sh. Styloite black, earthal are conglomerate. The can be scratched.

The base of the San Andres includes a zone of sandstone breccia. The of light color limestone the golden-colored surrounded by dark critical mudstone.

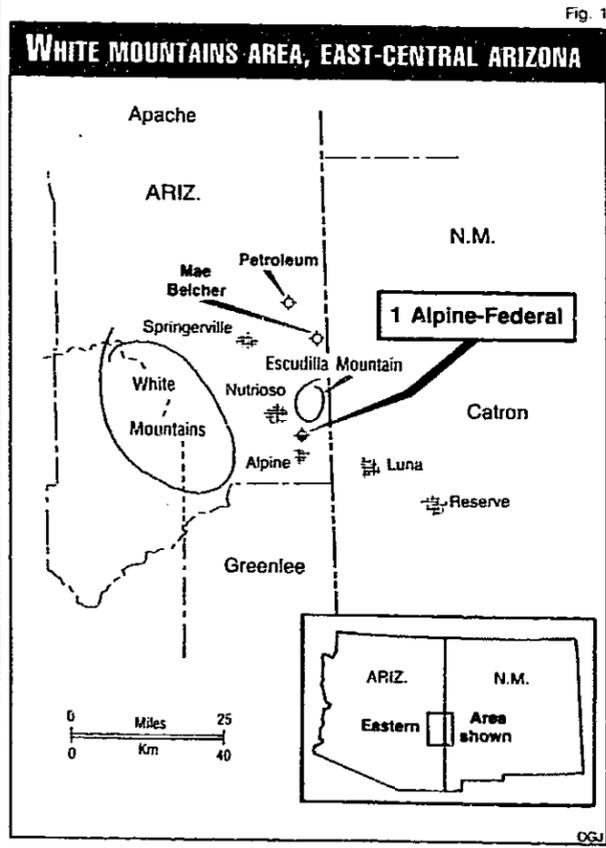


Fig. 1

EXPLORATION

and well indurated siltstone and sandstone to boulder conglomerate. The operator reported paleosols with root casts and thin-bedded crevasse-splay deposits in the finer grained material. The top of the Baca formation was picked at the first occurrence of red granite clasts in conglomerate.

Cretaceous rocks

The Cretaceous rocks, which resemble the Dakota sandstone, consist of white to light gray coarse-grained quartzose sandstone and dense dark gray to black mudstone. Thin coaly seams between 3 and 4 in. thick and dark gray to black laminations are common in the sandstone.

The laminations dip at an angle of about 30° and in some instances are disrupted. The sandstone has a salt and pepper texture in places. The dark mudstone gets progressively lighter and more calcareous uphole. The operator described the Cretaceous sequence as being organic rich and an oil source rock and reported what looked like dead oil at the top of the Cretaceous.

Woodward and Grant¹ identified the Dakota sandstone as containing both potential reservoir and source beds in west-central New Mexico.

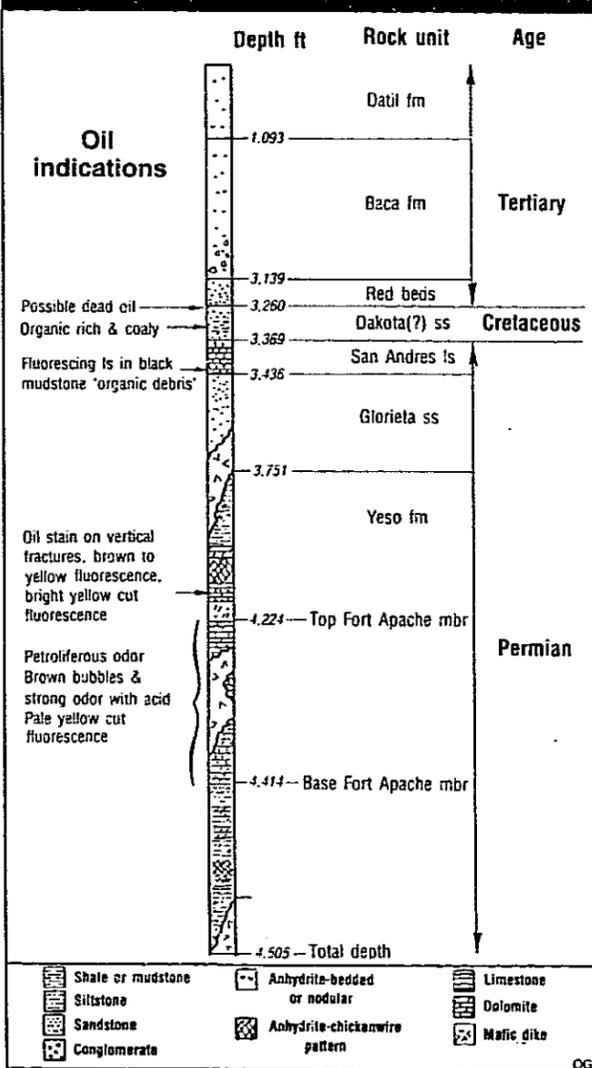
Permian oil shows

The San Andres limestone in the 1 Alpine-Federal is a medium dark gray micritic limestone. The limestone is dark, laminated, and interbedded with thin, dark gray to black shales.

Stylolites filled with a black, earthy organic material are common in the limestone. The organic material can be scraped off with the fingers.

The base of the San Andres includes a 2 ft thick zone of solution or collapse breccia. The breccia consists of light colored clasts of limestone that have an even, golden-colored fluorescence surrounded by non-fluorescing, dark gray to black micritic mudstone. The opera-

Fig. 2
ROCK UNITS PENETRATED IN 1 ALPINE-FEDERAL



tor reported organic debris in the collapse zone.

The strongest shows of oil in the 1 Alpine-Federal are in the Yeso formation, which consists of classic sea-margin sabkha deposits. Solution-brecciated blue-gray to light brown dolomite is interbedded with white to brown anhydrite and red to dark brown siltstone and mudstone. The anhydrite has a chickenwire pattern in places.

Scour marks and rip-up clasts of dolomite and anhydrite are present at the tops

and bottoms of the siltstone and mudstone layers. Bioturbation, soft-sediment deformation, and nodular anhydrite surrounded with mudstone are common. Calcareous zones may represent disrupted algal mats.

The upper part of the Yeso formation in the 1 Alpine-Federal contained several zones of petroliferous limestone, the most notable of which occurs between 4,028-4,140 ft, 200 to 85 ft above the Fort Apache member (Fig. 2).

This zone is a yellowish gray to yellowish brown with pinpoint porosity and thin dark laminations

throughout. Stylolites and small anhydrite nodules are common near the center of the zone. The zone yielded brown bubbles and a strong petroliferous odor when acid was applied.

Samples have a very faint straw-yellow cut and a pale-yellow cut fluorescence in 1,1,1-trichloroethane. A 2 ft interval at 4,028 ft contains fossil hash and has distinct oil staining along vertical fractures. These stains have a brown to yellowish-brown fluorescence and a bright yellow cut fluorescence.

The Fort Apache member is a rhythmically banded medium to dark gray fossiliferous limestone with thin dark laminations and numerous zones of yellowish-brown limestone. Porosity is pinpoint to very vuggy and vertical, calcite-filled fractures are present.

Dead oil stains some of the fractures and most of the pinpoint porosity. Most of the Fort Apache member has a faint petroliferous odor and yielded brown bubbles and a strong petroliferous odor when acid was applied. When the acid dried, distinct brown rims were evident on the rock.

The presence of petroliferous rock in the upper part of the Yeso was not unexpected. Heavy oil, oil staining, and dead to asphaltic oil were reported in the upper part of the Supai (Yeso) formation in several wells both north and west of the 1 Alpine-Federal.²

The petroliferous zone above the Fort Apache may correlate with a petroliferous zone reported above the Fort Apache in the Eastern Petroleum 1A Coyote Creek well, about 23 miles north of the 1 Alpine-Federal.

The 1 Alpine-Federal penetrated only 604 ft of the Permian Yeso formation. Isopach mapping based on the few wells to the west, north, and east suggests that as much as 1,500 ft of these rocks are present at this location, which leaves as much as 1,000 ft of Yeso beds yet

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EXPLORATION

to be penetrated at this locality. The presence of dikes may increase the depth necessary to fully penetrate the Yeso formation.

Pre-Permian rocks

The 1 Alpine-Federal well was not drilled deeply enough to encounter Pennsylvanian rocks.

Mapping by Wrucke,³ however, suggests that Pennsylvanian rocks may be present beneath the Yeso formation at the 1 Alpine-Federal location. Wrucke reported two large blocks of probable Pennsylvanian Naco limestone at elevations of 8,600 ft and 8,700 ft on the northeast flank of Escudilla Mountain, about 6.5 miles northeast of the 1 Alpine-Federal well. He surmised that volcanism had carried these large blocks of Naco limestone to the surface from their more extensive presence at depth.

The Pennsylvanian rocks are absent in two wells drilled north of Escudilla Mountain. The Eastern Petroleum 1A Coyote Creek in SW NE 27-10n-30e, about 23 miles north of the 1 Alpine-Federal, penetrated Permian rocks over granite at an elevation of +4,628 ft. The Mae Belcher 1 State in SW NE 20-9n-31e, about 18 miles north of the 1 Alpine-Federal, penetrated Permian rocks over granite at an elevation of about +4,366 ft.⁴

Thus Wrucke's recognition of the Naco limestone on Escudilla Mountain suggests that an edgeline of Pennsylvanian rocks exists between the 1 Alpine-Federal and the Mae Belcher and Eastern Petroleum wells. These rocks may be as much as 750 ft thick at the 1 Alpine-Federal location.^{5,6,7}

Regional isopach mapping suggests that as much as 165 ft of Mississippian rocks⁸ and 150 ft of Devonian rocks⁹ could be present at the 1 Alpine-Federal location. The Precambrian at the 1 Alpine-Federal location may be as deep as 6,570 ft, or rather, at an elevation of

+1,985 ft, about 2,400 ft structurally lower than the Precambrian surface at the Mae Belcher well.

Oil, gas possibilities

Woodward and Grant¹ reported that Devonian rocks in west-central New Mexico contained ideal source beds and noted the presence of potential source and reservoir rocks in the Pennsylvanian formations.

Stratigraphic traps may be present in these units where the Pennsylvanian, Mississippian, and Devonian rocks overlap the southward sloping Precambrian basement in the vicinity of the 1 Alpine-Federal. The oil and gas for these stratigraphic traps could have formed in place or migrated from Paleozoic source rocks in the deep Pedregosa basin to the south. Hydrocarbons may also have migrated from organic rich sediments deposited in ancient seas to the west and east of the 1 Alpine-Federal.

Stratigraphic traps in the Permian rocks may involve mafic dikes or sills. Igneous rock does not seem compatible with the accumulation of oil and gas, but in Northeast Arizona at Dineh-bi-Keyah field igneous rock of Tertiary age has produced more than 17 million bbl of a high gravity crude oil.

The igneous reservoir rock at Dineh-bi-Keyah field intruded white to light tan carbonates and black shales of the Pennsylvanian Hermosa formation and has yielded the largest amount of oil of any reservoir rock in Arizona.

The oil identified in the Permian rocks in the 1 Alpine-Federal could very well have accumulated in stratigraphic traps consisting of Permian-aged lenticular sands and fractured carbonates, or even in post-Permian igneous reservoir rocks.

Conclusions

The 1 Alpine-Federal penetrated three potentially important oil source rocks in east-central Arizona and west-central New Mexico

and showed that the Precambrian surface slopes more steeply to the south than was anticipated at this location.

Regional studies suggest that oil and gas may be trapped in pre-Permian formations yet to be penetrated at this locality.

The oil source rocks in the 1 Alpine-Federal include Cretaceous rocks, the Permian San Andres limestone, and most notably the Yeso formation. The Cretaceous contains organic material and possibly dead oil at the contact with the overlying Tertiary rocks.

The San Andres limestone was eroded to a thickness of 67 ft but contained an apparent collapse zone filled with angular to subrounded clasts of limestone cemented in dark gray to black mudstone with organic debris.

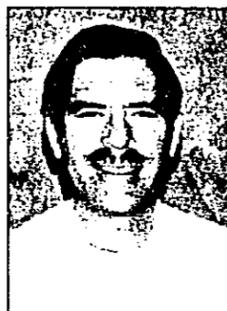
The best oil source rocks encountered in the hole were the petroliferous limestones of the Fort Apache member of the Yeso formation and limestone units above the Fort Apache member.

This region offers opportunities for exploration companies bold enough to explore for oil and gas beneath the extensive cover of volcanic rock in east-central Arizona and west-central New Mexico. Given that the oil source rocks in the 1 Alpine-Federal are unaffected by this volcanism, this region deserves further evaluation for oil and gas.

References

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5. Kottlowski, Frank E., Pennsylvanian rocks on the northeast edge of the Datil plateau, in Weir, J.E., and Baltz, E.H., eds., Guidebook of west-central New Mexico, New Mexico Geological Society 10th Field Conference, 1959, pp. 57-62.
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7. Kottlowski, Frank E., Sedimentary basins of south-central to southwestern New Mexico, AAPG Bull., Vol. 49, No. 11 (November), 1965, pp. 2,120-39.
8. Armstrong, A.K., Mamet, B.L., and Repetski, J.E., The Mississippian system of New Mexico and southern Arizona, in Fouch, T.D., and Magathan, E.R., eds., Paleozoic paleogeography of the west-central U.S., Rocky Mountain Section SEPM, 1980, pp. 82-99.
9. Beus, Stanley S., Late Devonian (Frasnian) paleogeography and paleoenvironments in northern Arizona, in Fouch, T.D., and Magathan, E.R., eds., Paleozoic paleogeography of the west-central U.S., Rocky Mountain Section SEPM, 1980, pp. 53-69.

THE AUTHOR



Rauzi

Steven L. Rauzi joined the Arizona Oil & Gas Conservation Commission in Phoenix in 1988. That agency was merged into the Arizona Geological Survey in 1991. He now serves as the oil & gas program administrator for the survey in Tucson. He worked for Texaco in Los Angeles as an exploration and development geologist during 1980-87. He received BS and MS degrees in geology from Utah State University in Logan.

- sources Bull. 85, 1964, 55 p.
5. Kottlowski, Frank E., Pennsylvanian rocks on the northeast edge of the Datil plateau, in Weir, J.E., and Baltz, E.H., eds., Guidebook of west-central New Mexico, New Mexico Geological Society 10th Field Conference, 1959, pp. 57-62.
 6. Kottlowski, Frank E., and Havenor, Kay C., Pennsylvanian rocks of the Mogollon rim area, Arizona, in Weber, R.H., and Peirce, H.W., eds., Guidebook of the Mogollon rim region, New Mexico Geological Society 13th Field Conference, 1962, pp. 77-83.
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agenda item 6 (Transfer Tonto Well) ✓



United States Department of the Interior

GEOLOGICAL SURVEY
Geothermal Studies Project
2255 North Gemini Drive
Flagstaff, Arizona 86001

PHONE 001 602 556 7226
FAX 001 602 556 7169
jsass@iflag2.wr.usgs.gov

FAX MESSAGE FROM JOHN SASS

*Sass called 12/1/93 to report
Moses and Gotham plan to
attend 1/14/94 mtg and request
copy of agenda be FAXed and
mailed to them.*

TO: Larry Fellows

DATE: November 19, 1993

As per our just concluded phone call, I am unable to attend today's meeting because of a family medical emergency. Following are some graphs and a table showing preliminary thermal data. These should not be considered as in the public domain yet as we have a great deal more lab and interpretive work, particularly on thermal conductivity, to get a consistent heat-flow result.

My position on taking over the well is summarized in Ted Mock's letter. We need to get Tonto released from their bond and get Ted's commitment of P&A funds accepted in lieu of a bond which, of course, federal government agencies are precluded by law from providing. In that connection, I should point out that the USGS and my project in particular has drilled over 50 research wells in Arizona, and has taken over several commercially drilled holes, including 5 of the NURE Uranium Exploration wells. In all cases we have plugged and abandoned the wells upon completion of our studies.

I'll be at my desk for most of the rest of the morning and reachable at the above phone and fax numbers.

Once again, sorry I cant attend the meeting.

3 PAGES FOLLOW; PLEASE DELIVER IMMEDIATELY

11/15/93

16:35

2025865124
CE-12 RENEWABLE ENERGY CONU + MINERALS

NO. 944 001

**DEPARTMENT OF ENERGY
WASHINGTON, DC 20585**

FILE COPY
Summary

cc: FS, *Alpine*

FACSIMILE TRANSMISSION

DATE: November 15, 1993

**TO: Mr. John Haas
U.S. Bureau of Land Management
3707 North 7th St.
Phoenix, AZ 85014**

TELEFAX: 602-650-0399

2 PAGES FOLLOW.

**John E. Mock
Geothermal Division
EE-122**

202-586-5340

Telefax: 202-586-5124



Department of Energy
Washington, DC 20585

November 15, 1993

Mr. John Haas
U.S. Bureau of Land Management
3707 North 7th St.
Phoenix, AZ 85014

Dear Mr. Haas:

As you know, the State of Arizona - U.S. Department of Energy Hot-Dry-Rock test well was completed near the end of August to the target depth of 4500 feet. A complete suite of continuous core was obtained between 500 feet and total depth, a limited set of commercial geophysical logs (gamma-ray/neutron) was run, and four high-resolution temperature logs were obtained by the U.S. Geological Survey (USGS) between August 31 and October 21. While this represents a substantial body of scientific data, two important objectives of great scientific value, critical to the assessment of the hot-dry-rock geothermal potential of the Springerville area, were not achieved.

1) Penetration of Precambrian basement rocks. Any potential geothermal reservoir will be located in the crystalline basement. Reasonable inferences from nearby outcrops and the nearest oil-exploration test wells indicated that basement would be encountered between 3300 and 4300 ft. A surprisingly thick sequence of Tertiary rocks and an unexpected layer of Mesozoic sedimentary rocks provided welcome new geologic data, but the hole bottomed out short of the Precambrian target. One of the critical questions regarding the geothermal potential of this area turns on whether the high heat flow observed in the sedimentary section continues a significant distance into the crystalline basement rocks.

2) Open-hole investigations including logging, downhole measurements, and fluid sampling. The nature of the procurement precluded completion of these important tasks.

With the successful conclusion of the original contract requirements, we have reached a decision point. Rather than abandon the well at this point, there is an opportunity for additional coring and testing before abandonment. The USGS is proposing to take over as operator of the well and to assume all responsibility from the present contractor (Tonto Drilling Inc.), and DOE will provide funding of up to \$25,000 to ensure a satisfactory plugging and abandonment of the well at the conclusion of this process. The USGS will operate the hole as a thermal observation well until a satisfactory equilibrium temperature profile has been obtained (temperature measurements to date are sufficient to satisfy Tonto's contractual obligations).

The researchers hope to deepen the well to reach Precambrian basement rocks. During the period of time needed to reach equilibrium temperature, additional funding will be sought by Mr. James Witcher of New Mexico State University (NMSU) and Dr. John Sass, Chief of the Heat-Mining Project, USGS. Contingent on acquiring the needed funds, a string of size-NQ drill rods left in the well will be partially removed to facilitate downhole testing. The size-NQ drill rods will then be rerun and the hole will be deepened with size-BQ into the crystalline basement. Open-hole measurements will then be made together with another series of temperature logs. Upon completion of this phase of measurements, the hole will be plugged and abandoned by the USGS or completed in a manner consistent with its employment as a long-term observation well for climatic-change studies and other purposes.

I greatly appreciate your cooperation and support in this project. The significant accomplishments we achieved are due to the group effort, and I would appreciate your help in continuing the scientific value of this well by transferring responsibility to the U.S. Geological Survey. Thank you again for your interest and collaboration on this important project.

Yours sincerely,

John E. Mock
John E. Mock, Director
Geothermal Division
Energy Efficiency and
Renewable Energy

Historical Note
Former A.

R12-7-202. General rules applied statewide

- A. Scope of rules. These rules are general rules of statewide application and shall apply to all areas; however, special rules, applicable to particular areas or subject matter, shall prevail over these general rules to the extent that they are in conflict therewith.
- B. Enforcement of laws, rules and regulations dealing with the conservation of geothermal resources. The Commission, by virtue of A.R.S. § 27-652 et seq., has jurisdiction and authority over such persons and property deemed necessary to administer and enforce the provisions of the statutes, rules, and regulations relating to the conservation of geothermal resources.
- C. Waste of geothermal resources is unlawful and prohibited.
- D. Classifying and defining areas. The Commission, on its own motion may, and on application of any interested person shall, after notice and hearing, determine whether a particular well or area is a geothermal resource well, or a geothermal resource area, or whether a reclassification should be made.
- E. Forms upon request
1. Forms for written notices, requests and reports required by the Commission will be furnished upon request.
 2. Requiring all forms and reports requested by the Commission to be submitted to the Commission on or before the 20th day of the next succeeding month for monthly reports or within 20 days following the completion of the action requiring the report, except as otherwise provided by the Commission.

Historical Note
Former B.

R12-7-203. Bond

- A. Before any person shall hereafter engage in the business of drilling for or producing a well in this state, such person shall file with the Commission a bond executed by such person as principal and some surety company satisfactory to the Commission as surety, in the principal sum of \$5,000 for each individual well or in the principal sum of \$25,000 as a blanket bond to cover all wells, payable to the Oil and Gas Conservation Commission, state of Arizona, for the use and benefit of the Oil and Gas Conservation Fund. Such bond shall be conditioned on the following requirements:
1. Compliance with all statutes and rules and regulations.
 2. Plugging and abandoning well as approved by the Commission.
- B. Transfer of property does not release the bond. If the property is transferred, and the principal desires to be released from the bond, the procedure shall be as follows:
1. The principal on the bond shall notify the Commission in writing that the well or wells, describing accurately the location of each, and the date and number of each permit to drill, has or have been transferred to a named transferee for the purposes of ownership or operation.
 2. The transferee of any well or of the operation of any such well shall declare in writing his acceptance of such transfer and of the responsibility of such well and shall submit a new bond or bonds unless his blanket bond applies to the well or wells.
- C. When the Commission approves the transfer, the transferor is released from all responsibility thereafter with respect to the well or wells, and the Commission in writing will declare that the transferor's bond or bonds applicable thereto now be released.

- D. The Commission will in writing inform the principal and the surety or sureties of any bond where there is compliance with the conditions of the bond so that liability under the bond may be formally terminated.
- E. The liability under any bond may not be terminated without written approval of the Commission.

Historical Note
Former Rule G-101.

R12-7-204. Application to drill and procedure to cancel a permit

- A. A person desiring to drill a well shall notify the Commission of such intent on a form prescribed by the Commission (Form G-3, see Appendix 1) and shall pay a fee of \$25.00 for each well. Said \$25.00 fee shall be considered earned upon issuance of the permit to drill. The application for permit to drill shall be accompanied by a plat, as provided in rule R12-7-207. The location must be surveyed and the submitted plat certified by a registered surveyor and bear his certificate number. (Surveyors registered in states other than Arizona are acceptable.)
1. Upon receipt of the application, the plat, the fee and bond filed in accordance with the provisions of this Section, the Commission will promptly issue such person a permit to drill, unless the drilling of the well is contrary to law, or to a rule, regulation, or order of the Commission or is not a permitted location under the well spacing as requested in any pending application before the Commission. The drilling of the well is prohibited until a permit to drill is obtained, except in the case of an emergency, and then as the Commission directs. The permit shall be on such form prescribed by the Commission (Form 27, see Appendix 1). If the permit is disallowed, the Commission will immediately notify the person in writing the reasons therefor. No emergency permit shall be granted for drilling of a well unless such well shall be drilled at a location as provided in rule R12-7-207, or as provided by other order of the Commission, as set forth in rules R12-7-205 and R12-7-207. Upon granting of an emergency permit, such permittee shall within ten days thereafter comply with the requirements of this rule as to filing application, fee, bond, and plat, or the emergency permit shall become null and void and the well shall be plugged and abandoned unless an extension in writing is granted by the Commission.
 2. Unless operations are commenced within 90 days after date of approval, the permit to drill will become null and void unless an extension in writing is granted by the Commission.
- B. If a permit has been issued, and in the event a violation of the Commission's rules and regulations or orders occurs, and if the well has been commenced, the Commission may order the permit holder to cease any further work under the permit in question; and the Commission may, after notice and hearing, cancel a permit for any violation of its rules and regulations or orders, may order the well to be plugged and abandoned, and may order the performance of all other obligations required by the rules and regulations or orders of the Commission.

Historical Note
Former Rule G-102.

R12-7-205. Change of location

- No person to whom the permit has been issued shall change the location of the well from the location authorized by the permit, until the following requirements have been complied with:
1. If, prior to the drilling of the well, the person to whom the permit was originally issued desires to change the location, or if after commencement of the drilling operations, it is

PAM-

MAIL DGCC AGENDA FOR 1/14/93

MTG TO: THOMAS H. MOSES
U.S.G.S.
345 MIDDLEFIELD RD
MENLO PARK, CA 94025
FAX: 415-329-4876

and TO: JOHN SASS
U.S.G.S.
2255 NORTH GEMINI DR
FLAGSTAFF, AZ 86001
FAX: 602-556-7169

PAM - PLEASE SEND OGCC
AGENDA (1-14-94 MTG) to:

BOB DYSON
U.S. FOREST SERVICE
P.O. BOX 469
ALPINE, AZ 85920

PAM - PLEASE SEND AGENDA
FOR JAN OGCC MTG TO:

JAMES C. LANSHE
645 EAST MISSOURI AVE
PHOENIX AZ 85012

JOHN M. KING SR.
CASTLE RESOURCES CORP.
P.O. BOX 6405
SCOTTSDALE AZ 85261



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 19, 1994

Mr. Jim Mitchell
Environmental Specialist
City of Avondale
525 North Central
Avondale, Arizona 85323

Dear Mr. Mitchell

I am writing to advise you that in its meeting of January 14, 1994, the Arizona Oil and Gas Conservation Commission passed a motion to provide a copy of the approved application for permit to drill to the County Manager of the County in which the well is located. The Commission passed this motion as a courtesy to local governments and to keep them informed and advised on future exploration drilling efforts in Arizona.

As you may recall from the Commission's March 12, 1993, meeting, the Commission issues a permit to drill, pursuant to A.R.S. § 516 and A.A.C. R12-7-104, only after it has determined that drilling of the well is in compliance with statutes and rules of the Commission and that correlative rights, public health and safety, and subsurface resources will not be compromised. The Commission works closely with the Department of Water Resources to ensure that surface casing is set deep enough to protect fresh water aquifers.

The drilling procedure for exploration wells is described in the enclosed article from the Winter 1992 issue of *Arizona Geology*. Even though this article discusses the well drilled near Litchfield Park in September 1992, the procedure described is applicable to all wells drilled for oil, gas, or geothermal resources in Arizona.

Please let me know if I can be of further assistance in this matter.

Sincerely,

Steven L. Rauzi
Oil and Gas Program Administrator

Enclosure

cc Commissioners and Larry Fellows

COUNTY MANAGERS* - JANUARY 1994

- ✓ APACHE
Clarence Bigelow
P.O. Box 428
St. Johns, AZ 85936
337-4364
- ✓ MOHAVE
David Grisez (Gra say)
P. O. Box 7000
Kingman, AZ 86401
753-0729
- ✓ COCHISE
Jody Klein (Administrator)
619 Melody Lane, Bldg. B
Bisbee, AZ 85603
432-9200
- ✓ NAVAJO
Eddie Koury
P. O. Box 668
Holbrook, AZ 86025
524-6161 Ext. 405
- ✓ COCONINO
James Keene
219 E. Cherry
Flagstaff, AZ 86001
779-6690
- ✓ PIMA
Chuck Huckelberry (Administrator)
130 W. Congress, 11th Floor
Tucson, AZ 85701
740-8135
- ✓ GILA
Daniel Field (Administrator)
1400 E. Ash Street
Globe, AZ 85501
425-3231 Ext. 404
- ✓ PINAL
Stan Griffis
P. O. Box 827
Florence, AZ 85232
868-6211
- ✓ GRAHAM
Joe Carter
800 Main Street
Safford, AZ 85546
428-3250
- ✓ SANTA CRUZ
Dennis Miller
2100 N. Congress Dr.
Nogales, AZ 85621
761-7800 Ext. 3053
- ✓ GREENLEE
Robert Stokes (Administrator)
P. O. Box 908
Clifton, AZ 85533
865-2310
- ✓ YAVAPAI
James M. Holst (Adminstrator)
255 E. Gurley St.
Prescott, AZ 86301
771-3200
- ✓ LA PAZ
Sandy Dodge (Acting Administrator)
P.O. Box C
Parker, AZ 85344
669-6115
- ✓ YUMA
Jim Stahle (Adminstrator)
198 S. Main St.
Yuma, AZ 85364
329-2104
- ✓ MARICOPA
Roy Pederson
301 W. Jefferson
Phoenix, AZ 85003
506-3571

* Title "County Administrator" noted with parentheses



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 19, 1994

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

Dear Mr. Bigelow:

I am writing to advise you that in its meeting of January 14, 1994, the Arizona Oil and Gas Conservation Commission passed a motion to provide a copy of the approved application for permit to drill to the County Manager of the County in which the well is located. The Commission passed this motion as a courtesy to local governments and to keep them informed and advised on future exploration drilling efforts in Arizona.

For your information, the Commission issues a permit to drill pursuant to A.R.S. § 516 and A.A.C. R12-7-104 after it has determined that drilling of the well is in compliance with statutes and rules of the Commission and that correlative rights, public health and safety, and subsurface resources will not be compromised. The Commission works closely with the Department of Water Resources to ensure that surface casing is set deep enough to protect fresh water aquifers.

The drilling procedure for exploration wells is described in the enclosed article from the Winter 1992 issue of *Arizona Geology*. Even though this article discusses a well drilled near Litchfield Park in September 1992, the procedure described is applicable to all wells drilled for oil, gas, or geothermal resources in Arizona.

Please feel free to contact me at the letterhead address if you have any comments on the Commission's motion or if I may answer any questions about oil, gas, or geothermal activity in Arizona.

Sincerely,

Steven L. Rauzi
Oil and Gas Program Administrator

Enclosure



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 19, 1994

Mr. Jody Klein
Cochise County Administrator
619 Melody Lane, Bldg. B
Bisbee, Arizona 85603

Dear Mr. Klein:

I am writing to advise you that in its meeting of January 14, 1994, the Arizona Oil and Gas Conservation Commission passed a motion to provide a copy of the approved application for permit to drill to the County Administrator of the County in which the well is located. The Commission passed this motion as a courtesy to local governments and to keep them informed and advised on future exploration drilling efforts in Arizona.

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Sincerely,

Steven L. Rauzi
Oil and Gas Program Administrator

Enclosure



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 19, 1994

Mr. James Keene
Coconino County Manager
219 East Cherry
Flagstaff, Arizona 86001

Dear Mr. Keene:

I am writing to advise you that in its meeting of January 14, 1994, the Arizona Oil and Gas Conservation Commission passed a motion to provide a copy of the approved application for permit to drill to the County Manager of the County in which the well is located. The Commission passed this motion as a courtesy to local governments and to keep them informed and advised on future exploration drilling efforts in Arizona.

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Sincerely,

Steven L. Rauzi
Oil and Gas Program Administrator

Enclosure



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 19, 1994

Mr. Daniel Field
Gila County Administrator
1400 East Ash Street
Globe, Arizona 85501

Dear Mr. Field:

I am writing to advise you that in its meeting of January 14, 1994, the Arizona Oil and Gas Conservation Commission passed a motion to provide a copy of the approved application for permit to drill to the County Administrator of the County in which the well is located. The Commission passed this motion as a courtesy to local governments and to keep them informed and advised on future exploration drilling efforts in Arizona.

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Sincerely,

Steven L. Rauzi
Oil and Gas Program Administrator

Enclosure



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 19, 1994

Mr. Joe Carter
Graham County Manager
800 Main Street
Safford, Arizona 85546

Dear Mr. Carter:

I am writing to advise you that in its meeting of January 14, 1994, the Arizona Oil and Gas Conservation Commission passed a motion to provide a copy of the approved application for permit to drill to the County Manager of the County in which the well is located. The Commission passed this motion as a courtesy to local governments and to keep them informed and advised on future exploration drilling efforts in Arizona.

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Sincerely,

Steven L. Rauzi
Oil and Gas Program Administrator

Enclosure



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 19, 1994

Mr. Robert Stokes
Greenlee County Administrator
P. O. Box 908
Clifton, Arizona 85533

Dear Mr. Stokes:

I am writing to advise you that in its meeting of January 14, 1994, the Arizona Oil and Gas Conservation Commission passed a motion to provide a copy of the approved application for permit to drill to the County Administrator of the County in which the well is located. The Commission passed this motion as a courtesy to local governments and to keep them informed and advised on future exploration drilling efforts in Arizona.

For your information, the Commission issues a permit to drill pursuant to A.R.S. § 516 and A.A.C. R12-7-104 after it has determined that drilling of the well is in compliance with statutes and rules of the Commission and that correlative rights, public health and safety, and subsurface resources will not be compromised. The Commission works closely with the Department of Water Resources to ensure that surface casing is set deep enough to protect fresh water aquifers.

The drilling procedure for exploration wells is described in the enclosed article from the Winter 1992 issue of *Arizona Geology*. Even though this article discusses a well drilled near Litchfield Park in September 1992, the procedure described is applicable to all wells drilled for oil, gas, or geothermal resources in Arizona.

Please feel free to contact me at the letterhead address if you have any comments on the Commission's motion or if I may answer any questions about oil, gas, or geothermal activity in Arizona.

Sincerely,

Steven L. Rauzi
Oil and Gas Program Administrator

Enclosure



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 19, 1994

Ms. Sandy Dodge
La Paz County Administrator (Acting)
P. O. Box C
Parker, Arizona 85344

Dear Ms. Dodge:

I am writing to advise you that in its meeting of January 14, 1994, the Arizona Oil and Gas Conservation Commission passed a motion to provide a copy of the approved application for permit to drill to the County Administrator of the County in which the well is located. The Commission passed this motion as a courtesy to local governments and to keep them informed and advised on future exploration drilling efforts in Arizona.

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Sincerely,

Steven L. Rauzi
Oil and Gas Program Administrator

Enclosure



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Governor

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(602) 882-4795



Larry D. Fellows
Director and State Geologist

January 19, 1994

Mr. Roy Pederson
Maricopa County Manager
301 West Jefferson
Phoenix, Arizona 85003

Dear Mr. Pederson:

I am writing to advise you that in its meeting of January 14, 1994, the Arizona Oil and Gas Conservation Commission passed a motion to provide a copy of the approved application for permit to drill to the County Manager of the County in which the well is located. The Commission passed this motion as a courtesy to local governments and to keep them informed and advised on future exploration drilling efforts in Arizona.

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Sincerely,

Steven L. Rauzi
Oil and Gas Program Administrator

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Larry D. Fellows
Director and State Geologist

January 19, 1994

Mr. David Grisez
Mohave County Manager
P. O. Box 7000
Kingman, Arizona 86401

Dear Mr. Grisez:

I am writing to advise you that in its meeting of January 14, 1994, the Arizona Oil and Gas Conservation Commission passed a motion to provide a copy of the approved application for permit to drill to the County Manager of the County in which the well is located. The Commission passed this motion as a courtesy to local governments and to keep them informed and advised on future exploration drilling efforts in Arizona.

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Sincerely,

Steven L. Rauzi
Oil and Gas Program Administrator

Enclosure



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Tucson, Arizona 85719
(602) 882-4795



Larry D. Fellows
Director and State Geologist

January 19, 1994

Mr. Eddie Koury
Navajo County Manager
P. O. Box 668
Holbrook, Arizona 86025

Dear Mr. Koury:

I am writing to advise you that in its meeting of January 14, 1994, the Arizona Oil and Gas Conservation Commission passed a motion to provide a copy of the approved application for permit to drill to the County Manager of the County in which the well is located. The Commission passed this motion as a courtesy to local governments and to keep them informed and advised on future exploration drilling efforts in Arizona.

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Sincerely,

Steven L. Rauzi
Oil and Gas Program Administrator

Enclosure



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(602) 882-4795



Larry D. Fellows
Director and State Geologist

January 19, 1994

Mr. Chuck Huckelberry
Pima County Administrator
130 West Congress, 11th Floor
Tucson, Arizona 85701

Dear Mr. Huckelberry:

I am writing to advise you that in its meeting of January 14, 1994, the Arizona Oil and Gas Conservation Commission passed a motion to provide a copy of the approved application for permit to drill to the County Administrator of the County in which the well is located. The Commission passed this motion as a courtesy to local governments and to keep them informed and advised on future exploration drilling efforts in Arizona.

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Sincerely,

Steven L. Rauzi
Oil and Gas Program Administrator

Enclosure



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Governor

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(602) 882-4795



Larry D. Fellows
Director and State Geologist

January 19, 1994

Mr. Stan Griffis
Pinal County Manager
P. O. Box 827
Florence, Arizona 85232

Dear Mr. Griffis:

I am writing to advise you that in its meeting of January 14, 1994, the Arizona Oil and Gas Conservation Commission passed a motion to provide a copy of the approved application for permit to drill to the County Manager of the County in which the well is located. The Commission passed this motion as a courtesy to local governments and to keep them informed and advised on future exploration drilling efforts in Arizona.

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Sincerely,

Steven L. Rauzi
Oil and Gas Program Administrator

Enclosure



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(602) 882-4795



Larry D. Fellows
Director and State Geologist

January 19, 1994

Mr. Dennis Miller
Santa Cruz County Manager
2100 North Congress Drive
Nogales, Arizona 85621

Dear Mr. Miller:

I am writing to advise you that in its meeting of January 14, 1994, the Arizona Oil and Gas Conservation Commission passed a motion to provide a copy of the approved application for permit to drill to the County Manager of the County in which the well is located. The Commission passed this motion as a courtesy to local governments and to keep them informed and advised on future exploration drilling efforts in Arizona.

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Sincerely,

Steven L. Rauzi
Oil and Gas Program Administrator

Enclosure



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Governor

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Tucson, Arizona 85719
(602) 882-4795



Larry D. Fellows
Director and State Geologist

January 19, 1994

Mr. James M. Holst
Yavapai County Administrator
255 East Gurley Street
Prescott, Arizona 86301

Dear Mr. Holst:

I am writing to advise you that in its meeting of January 14, 1994, the Arizona Oil and Gas Conservation Commission passed a motion to provide a copy of the approved application for permit to drill to the County Administrator of the County in which the well is located. The Commission passed this motion as a courtesy to local governments and to keep them informed and advised on future exploration drilling efforts in Arizona.

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Sincerely,

Steven L. Rauzi
Oil and Gas Program Administrator

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Larry D. Fellows
Director and State Geologist

January 19, 1994

Mr. Jim Stahle
Yuma County Administrator
198 South Main Street
Yuma, Arizona 85364

Dear Mr. Stahle:

I am writing to advise you that in its meeting of January 14, 1994, the Arizona Oil and Gas Conservation Commission passed a motion to provide a copy of the approved application for permit to drill to the County Administrator of the County in which the well is located. The Commission passed this motion as a courtesy to local governments and to keep them informed and advised on future exploration drilling efforts in Arizona.

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Sincerely,

Steven L. Rauzi
Oil and Gas Program Administrator

Enclosure

Oil & Gas Conservation Commission

Meeting January 14, 1994

Sign - In Sheet

<u>NAME</u>	<u>REPRESENTING</u>
JOHN HAAS	BUREAU OF LAND MANAGEMENT
LW BROOKS	IND OIL & GAS PRODUCER, DENVER, CO
Tom Moses	U.S. GEOLOGICAL SURVEY, MENDO PARK, CA
Fritz L. Gorsham	FIELD SOLICITOR, DOT
Bert Reed	Reed Petroleum - Reg.
FRANK MANCINI	AZ. Dept of Commerce
John E. Crawford	Consultant, Ariz. Dept. Commerce
JOHN M. KING SR.	CASTLE RESOURCES CORP.
BERYL I. DOLSKY	ATTY GEN SEN SR MAN
Michel Mills	ATTY Gen 4
Jean Salvatierra	AZ Dept. of Env. Quality

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

Minutes of Meeting
August 20, 1993

Present:

Mr. James E. Warne, Jr., Vice-Chairman
Dr. J. Dale Nations, 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 August 20, 1993, was called to order by Mr. James E. Warne, Jr., Vice-Chairman, at 10:00 a.m. in Room 500, State Capitol Tower, Phoenix, Arizona.

HEARING ON APPLICATION TO AMEND PERMIT FOR INJECTION WELL AT DRY MESA FIELD

At 10:05 a.m., the hearing on Dry Mesa Corporation's requested amendments to its disposal well in the Dry Mesa Field started. Minutes for that hearing are presented separately.

APPROVAL OF MINUTES OF MEETING AND OF THE EXECUTIVE SESSION OF MARCH 12, 1993

Dr. Nations moved, seconded by Mr. Veale:

THAT THE MINUTES OF THE MEETING AND OF THE EXECUTIVE SESSION
OF MARCH 12, 1993, BE ACCEPTED AS PRESENTED

Motion carried unanimously.

STATEMENT OF DIRECTOR AND STATE GEOLOGIST

Dr. Fellows reported that he is busy closing the fiscal year that ended on June 30, assigning projects for the coming year, and preparing the annual report for fiscal year 1992-93. He is also working on the fiscal year 1994-95 budget.

Dr. Fellows reported that the bulk of the core from the Tertiary section in the well being cored near Alpine will be on permanent loan to the New Mexico Bureau of Mines and Mineral Resources in Socorro where they have a nice core storage facility and a couple of staff people actively working on the upper part of the hole. He advised that all of the core below the Tertiary will be stored at our repository plus a sampling of the upper part and noted that all other cores in our repository have been skeletonized. Dr. Nations was concerned about the lack of adequate core storage space in Arizona. Dr. Fellows advised that our sampling from the Tertiary exceeds the minimum required by rule and that we do not have a budget to pay for excessive core storage. He noted that to date there has been very little demand for research on the core we do have stored.

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 updated the Commissioners on the Alpine-Federal #1 well and advised that the operator of the well planned to request observational status for up to two years and that the U.S. Geological Survey desired to assume the responsibility for the well and deepen it into Precambrian rocks. The Commission agreed in principle to the change of status and transfer of responsibility to the U.S Geological Survey but would not make a final decision until the issues of posting a bond, the assumption of responsibility, and the setting of a specific time frame for deepening or plugging the hole are resolved by some sort of written agreement.

Mr. Rauzi reported that the Sunbelt Refinery near Coolidge would cease operations by August or September. Sunbelt planned to mothball the refinery until asphalt prices firm and ongoing environmental litigation is resolved.

Mr. Rauzi reported that PB-KBB plans to run a sonar caliper log to verify the volume of cavern 1 at the Amerigas LPG-storage facility early next year. PB-KBB advised him that it is becoming increasingly difficult to get a sonar caliper run since there are only four small companies that run them. They asked the Commission to consider the interface-volume method as an alternative to the sonar caliper and indicated to Mr. Rauzi that they would send him a summary of this method so that he could present it to the Commission for their consideration.

Mr. Rauzi reported that he is still waiting to hear from Ms. Clark on their discussions on the second set of rules. He discussed the third set with Mr. Fiegan and will be sending the resulting changes to the Commissioners for approval as soon as he hears back from him. Mr. Dulsky added that the third set looked fine and he expected them to be certified quickly unless Ms. Stewart had changes.

CLOSE RECORD AND REPEAL A.A.C. R12-7-193 AND R12-7-195

No oral proceedings were scheduled on the repeal of these two rules and Mr. Rauzi reported that no written comments were received. The closing date for written comments was July 30, 1993.

Mr. Veale moved, seconded by Dr. Nations:

THAT THE COMMISSION CLOSE THE RECORD, ADOPT THE CONCISE EXPLANATORY STATEMENT, AND REPEAL R12-7-193 AND R12-7-195 SUBJECT TO CERTIFICATION BY THE ATTORNEY GENERAL

Motion carried unanimously.

Mr. Warne signed the documents on these two rules and Mr. Rauzi advised that he would forward the two rules to the Attorney General.

DISCUSS FORFEITURE OF CONTENDER OIL COMPANY BOND

Mr. Rauzi discussed getting the Aman #1 well plugged with the \$5,000 bond and reported that he wrote to Contender Oil Company and asked them to voluntarily forfeit their bond. His letter was returned unopened. He reported that the Arizona Department of Water Resources is interested in

using the well as an observation well. They will accept responsibility for it if the Commission will transfer the bond money with the well and if they could work out an access agreement with the land owner. Since the property is being sold, the Department of Water Resources will need to wait until the sale is finalized before working out the access agreement.

Dr. Nations moved, seconded by Mr. Veale:

THAT THE COMMISSION FORFEIT THE CONTENDER OIL COMPANY BOND
FOR NONCOMPLIANCE WITH RULES AND STATUTES

Motion carried unanimously.

ASSISTANT ATTORNEY GENERAL REPORT ON CONTENDER AND POWER RANCH
WELLS

Dr. Nations moved, seconded by Mr. Veale:

THAT THE COMMISSION GO INTO EXECUTIVE SESSION

Motion carried unanimously. At 11:10 a.m., the Executive Session began.

The regular meeting resumed at 11:46 a.m.

ELECTION OF OFFICERS

Mr. Warne moved, seconded by Mr. Veale:

THAT DR. NATIONS BE NOMINATED CHAIRMAN

Motion carried unanimously.

Mr. Veale moved, seconded by Dr. Nations:

THAT MR. WARNE BE NOMINATED VICE-CHAIRMAN

Motion carried unanimously.

CALL TO THE PUBLIC

None.

ANNOUNCEMENTS

The next meeting was scheduled for January 14, 1994, in Room 500 of the Capitol Tower.

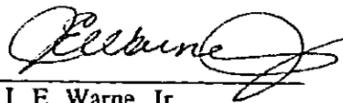
ADJOURNMENT

Dr. Nations moved, seconded by Mr. Veale:

THAT THE MEETING BE ADJOURNED

Motion carried unanimously. Time of adjournment was 12:00.

APPROVED



Mr. J. E. Warne, Jr.
Vice-Chairman

GUESTS IN ATTENDANCE:

Beryl I. Dulsky
Barry A. Wieland
Kent L. Carter
Renee Bahl
Melodie Jones

Attorney General's Office
Chuska Energy Company
McFate Reporting Service
JLBC
OSPB