

OIL & GAS CONSERVATION COMMISSION
Meeting: March 16, 1973
Mr. John Bannister, Exec. Sec.



OFFICE OF
Oil and Gas Conservation Commission
 STATE OF ARIZONA
 4515 NORTH 7TH AVE.
 PHOENIX, ARIZONA 85013
 PHONE: (602) 271-5161

A G E N D A

Meeting
 March 16, 1973
 4515 N. 7th Avenue, Phoenix, Arizona

10:00 a.m.

Call to order

- 1 ✓ Approval of minutes of meeting of February 16, 1973
- 2 ✓ Report of Executive Secretary
- 3 ✓ Report of Enforcement Section
- 4 ✓ Report of Geology Section
- 5 ✓ Old Business *Ed's trip*
6. New Business *my trip to Santa Fe*
7. Adjourn *panels - gasoline shortages*

8

*New Business
 APS in 1973*

*my trip to Santa Fe
 panels on shortages*

IF YOU ARE UNABLE TO ATTEND THIS MEETING, PLEASE NOTIFY THIS OFFICE AS SOON AS POSSIBLE.

Koester Apr 8 - 12 Salt Symposium

OIL AND GAS CONSERVATION COMMISSION
4515 N. 7th Avenue
Phoenix, Arizona 85013

Minutes of Meeting
February 16, 1973

Present:

Mr. Ralph W. Bilby, Chairman
Mr. W. Roger Hafford, Vice Chairman
Mr. Robert A. Bledsoe, Member
Mr. F. Keith Benton, Member

The regular Commission meeting for the month of February, 1973 was called to order by Chairman Ralph Bilby at 10:00 a.m.

Minutes of the meeting of January 19, 1973 were approved as written.

Reports of Executive Secretary, Enforcement Section and Geology Section were accepted.

Executive Secretary advised that House Bill 2131, the bill requested by the Commission to authorize it to charge fees for certain services, was introduced by Representative C. W. Lewis and has been passed by the Natural Resources Committee of the House of Representatives. The bill is still to go through the Ways and Means and the Rules Committees. House Bill 2006 would create a Natural Resources Commission and would combine several of the state agencies, however the Oil and Gas Conservation Commission would not be included. House Bill 2108 would create a Department of Science and Technology and would include the Oil and Gas Conservation Commission. This bill is still in committees.

Mr. Mike O'Donnell of Geothermal Kinetics Systems Corporation, which is drilling the first geothermal well in the State of Arizona, advised of the interest generated in the drilling. A steam purchase contract has been entered into with Arizona Public Service, Salt River Project and Tucson Gas and Electric Companies, in the event the drilling is successful.

General discussion followed on the diminishing supply of natural energy sources in the United States.

Executive Secretary advised that the Auditor General has completed an audit of the Commission records covering the period July 1, 1972 through December 31, 1972 and an audit report will be issued shortly.

Executive Secretary advised that the second payment of \$5,000 from the Four Corners Regional Commission for a technical assistance grant for geophysical and geological exploration conducted

Minutes of Meeting
February 16, 1973
Page 2

by the University of Arizona under the direction of the Commission, as described at the regular Commission meeting of July 21, 1972, is now being processed.

Meeting adjourned at 11:40 a.m.

APPROVED

Ralph W. Bilby, Chairman

Also present at above meeting:

Dr. J. J. Wright, Assistant Dean
Department of Geosciences
University of Arizona
Tucson, Arizona

Mr. A. K. Doss
Chief, Minerals Section
State Land Department
Phoenix, Arizona

Mr. Mike O'Donnell
General Manager
Geothermal Kinetics Systems Corp.
Phoenix, Arizona



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March 7, 1973

Memo: Commissioners
From: John Bannister

House Bill 2131 is progressing satisfactorily and, at this time, has cleared the House and is now in the Senate. It will be assigned to the Natural Resources Committee and probably Finance and Revenue and, of course, Rules.

It appears that the various bills in both House and Senate seeking to establish a Department of Natural Resources will not pass at this time. Each bill has been attacked for one reason or another. In general, the feeling seems to be that the various interested parties feel it would be detrimental to place the various regulatory agencies concerned with natural resources under one head appointed by the Governor. It is their feeling this would, perhaps, put too much power in the Governor and too much power in the appointee.

House Bill 2160 and Senate Bill 1106 are identical bills wherein it is sought to grant executors, administrators or guardians the right to give a lease on geothermal resources for a period in excess of ten years. These bills are progressing satisfactorily.

The Executive Committee of the IOCC is meeting in Santa Fe, New Mexico on March 9th and I will attend as Arizona's representative. I might add I have also been appointed as Chairman of the Environmental Protection Advisory Committee.

We have received the second payment of \$5,000 pursuant to contract of July 1, 1972 with Four Corners Regional Commission. This money has been transferred to the University of Arizona in accordance with agreement with them. There will be one further payment due the Commission in the amount of \$4,000. Of this amount, \$500 will remain with the Commission for printing costs, inasmuch as we are obligated to furnish to the Regional Commission 100 copies of each of the reports we are to receive. Should there be any excess money

Memo: Commissioners
3-7-73
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in this fund, it will be used in printing of additional materials based upon the work generated by the contract with Four Corners.

The geothermal well drilling southeast of Chandler, Arizona is progressing satisfactorily, according to the geologist in charge. Mr. Allen will make a more detailed report on this project.

Mr. P. K. Hurlbut of the Mineral Resources Department with the Navajo Indians has advised that the Tribe is still seeking ways in which to increase the interest of oil and gas companies in exploring the Reservation. Apparently the Indians are further engaged in attempting to remove other than Indians from positions of authority in the Tribe and consequently Mr. Hurlbut is seeking employment elsewhere. I would request that this information be kept completely confidential. Much of the Indians problems are of their own making, in that while seeking to interest non-Indian finances to develop the Reservation, they do not provide a friendly or cooperative atmosphere in which to work; to the contrary, many times the attitude of the individual Indian and the Tribe is hostile.



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ACTIVITY REPORT

March 7, 1973

Memo from W. E. Allen, Director
Enforcement Section

We are attaching an article from "The Petroleum Independent" that you might find interesting. This article would be amusing if the real situation wasn't so serious.

Exxon Corporation has suspended their stratigraphic drilling tests for oil and gas sources in Southern Arizona. The firm will now begin evaluation of their results. Harry Martin, head of the frontier development for the Midland, Texas firm, said it is not known how long it will take to go over the results of the drilling at four different sites here in Arizona. Over the past nine months Exxon has drilled a well in Pinal County, two in Yuma County and one in Pima County. The last well drilled by Exxon, the Yuma Federal No. 1, SW/NE Section 8-T11S-R24W, Yuma County, reached a total depth of 11,444 and has been plugged and abandoned.

American Fuels Corporation, an Albuquerque, New Mexico firm, has been issued a permit to drill their Navajo "B" Well No. 1, SE/SW Section 9-T40N-R29E, Apache County. They have a proposed total depth of 6800' and are now drilling at 1100'.

Williams Energy Company have completed drilling their four holes that were drilled in order to create additional storage capacity at their Adamana Storage Project. The actual completion of the storage reservoir will not be completed until approximately the middle of the summer. This is due to the time it will take to wash out the salt section to the dimensions the operators are seeking.

I have been spending considerable time at the Geothermal Kinetics Systems Corp. Power Ranches Inc., No. 1 Well site in an effort to get all the information possible pertaining to the mechanics of drilling a well for geothermal resources. The operators have made one drill stem test on this hole. This test was made February 25th and was witnessed by myself and Mr. Bannister.

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Activity Report
3-7-73 / Mr. W. E. Allen

Apparently the drilling of the geothermal test has created considerable interest in this resource. Our requests for information on this resource have increased markedly. We have also had numerous requests for Geothermal Rules and Regulations.

The Cathedral No. 1 Federal SE/SW Section 16-T17N-R5E, Yavapai County, was plugged March 1, 1973. They attempted to plug the well February 28, 1973, but were rained out and could not get cement on location. I was present to witness the plugging operations.

Astro-Tex Oil Corporation of Arizona has been granted permission to plug and abandon their Astro-Tex Federal No. 1, NW/NE Section 31-T5N-R17E, Gila County. They have reached a total depth of 2105'.

P & H No. 1 Federal, NW/SW Section 30-T2S-R9W, Maricopa County, has cemented 7" casing in the hole and will drill cement plug Friday. They have moved the spudder off the location and have moved in a rotary rig.

We have made a survey of the storage capacities of the major fuel storage terminals in the State. The information obtained will be included in an energy map being prepared by the geological section.

Delta Geophysical is busy with a Vibroseis crew working westerly from Gila Bend. Supposedly, this geophysical work is being done by Delta on a speculative basis. There are rumors afloat that one or more of the major companies are contributing to this work. Exxon and Amoco are the companies most mentioned.



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March 7, 1973

ACTIVITY REPORT

J. N. Conley
Director, Geology Section

PUBLICATIONS

County Well Location Maps. The map of Cochise County has been printed and distributed. Previously published county maps: Maricopa, Pinal, and Yuma. Maps of Yavapai, Mohave and Pima-Santa Cruz Counties are completed. The Yavapai County map will be printed and distributed this fiscal year. Budget limitations may necessitate postponing publication of the other maps until after June 30, 1973.

* * * * *

The long north-south dimensions of Apache and Navajo Counties, and local relatively high density of wells, precludes utilization of the 1:500,000 (1" = 8 miles) scale of the Basin and Range Province maps. Regional base maps, encompassing Apache, Coconino and Navajo Counties, and small portions of adjacent counties, are being drafted at a scale of 1:250,000 (1" = 4 miles). This scale is sufficiently large to show all wells in the few high density areas. It matches the scale of the useful map series published by the U. S. Geological Survey, Topographic Division, (the old Army Map Series), the Navajo-Hopi Indian Reservation map used by the Water Resources Division of the Survey, and permits enlargement of local areas to match the 1" = 2 miles useful general highway map published by the Arizona State Highway Department. It is therefore a scale that will be useful to other governmental agencies.

* * * * *

Subsurface Temperature Map. Requests for this map have increased recently as a result of an announcement submitted by Dr. J. J. Wright of its availability in the NEWSLETTER published by the GEOTHERMAL RESOURCES COUNCIL, Davis, California.

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Activity Report
Page Two
March 7, 1973

Index of Well Samples - Arizona. A mimeographed list of 44 sets of samples of wells drilled since publication of this index in June, 1970, has been inserted into the remaining 300 copies. We have distributed 400 copies to date.

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Sources of Information. Our supply of the second printing of this booklet is about exhausted. It will be up-dated and a new supply printed this fiscal year.

* * * * *

Arizona Well Location Map No. 3. Requests for this map have increased recently, apparently as a result of a listing in the information bulletin of the Western Association of Map Libraries. One request came from a library in England.

* * * * *

Energy Distribution Systems in Arizona. The originally planned oil and gas pipeline map has been expanded in scope to also show the principal electricity transmission lines, power plants, the railroad serving the Peabody coal mining operation in Navajo County, and petroleum storage terminals. This map will be ready for the printer later this month. As mentioned in the January, 1973 Activity Report, this map will be particularly useful to Civil Defense personnel, and several other governmental agencies, as well as to energy companies.

INVESTIGATIVE PROJECTS - FOUR CORNERS REGIONAL COMMISSION

Technical Grants. As required by the contract, a status report of the various projects was submitted to the Four Corners Regional Commission this past January. The report was approved, and the second payment of \$5,000.00 has been received.

Dr. John S. Sumner reports that the unfinished geophysical projects will be completed prior to June 15th.

Carlos Aiken, co-author of the completed Holbrook Area report, is presenting a paper based on this report to the Cordilleran Section of the Geological Society of America's annual meeting in Portland, Oregon the last week of this month. Hopefully, this paper may create some interest in the Holbrook area on the part of oil company geologists and geophysicists attending the meeting.

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To make the report submitted to us by Aiken and Sumner more useful to petroleum and mining geologists we are preparing a map showing all of the wells drilled (oil, gas, helium, potash, water and other objectives) in the critical area.

GEOPHYSICAL AND GEOLOGICAL EXPLORATION

Geophysical Companies. As reported previously, Geophysical Services, Inc. and Delta Exploration Company were conducting or planning to conduct seismic surveys on a speculative basis in portions of the Basin and Range Province. We have confirmed that G.S.I. definitely "shot" a profile from the general Phoenix area southeastward into the Sulphur Springs Valley in Cochise County and probably on eastward to New Mexico. A gravity profile survey was made alongside the seismic line. At last report Delta Exploration was working in Township 5 South, Range 7 West, west of the town of Gila Bend.

* * * * *

A graduate student, C. Dean Lausten, at Arizona State University, has about completed a gravity meter investigation of the Paradise Valley area from the Salt River northward to the vicinity of Carefree. The title of his thesis is: Gravity Method Applied to the Hydrology and Environmental Geology of the Paradise Valley, Maricopa County, Arizona. We have assisted Lausten in furnishing some well data.

* * * * *

A representative of Fugrow, a consulting engineering and geological firm, Long Beach, California, contacted this Commission last month in search of geophysical and geological data in Arizona. He was particularly interested in southwestern Yuma County. He said that his firm had been hired by Governor Williams' office for studies in connection with a proposed nuclear project for the desalinization of water.

* * * * *

If present plans of the Navajo Tribal Council materialize, some grant money for geological studies directed toward evaluation of the reservation's petroleum potentialities by graduate students may be available later this year. Mr. P. K. Hurlbut, formerly Supervisor of the Minerals Division of the Tribe, is now solely concerned with the evaluation of hydrocarbon resources. He has orally expressed a desire to work closely with this Commission.

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Mobil Oil, in addition to past and present geological investigations in southeastern Arizona, is now apparently making some subsurface studies in Yuma County.

* * * * *

Warren Carr, an independent geologist in Oklahoma City, is reportedly trying to promote a test well in the Holbrook area. Carr was in charge of Arkla Exploration Company's exploration in this area for potash and uranium.

* * * * *

A graduate student at Northern Arizona University will make a gravity meter survey of the Coconino Point Quadrangle in Townships 27-30 North, Ranges 6-8 East next summer. The stations will be on one-mile centers and will represent a northward continuation of a similar-spaced survey of the S P Mountain Quad.

* * * * *

Edward Koester has about completed a compilation and posting of measured outcrop sections of Mesozoic and Paleozoic rocks in the Colorado Plateau Province of the State. Final completion of this data will enable us to prepare more accurate isopachous maps of geologic units than are available currently. Better structural interpretations of the top of the Mississippian and other horizons can then be made.

* * * * *

An Amoco Production Company geologist did some "follow-up" field work in the Basin and Range Province this past month. He reported that their surface and subsurface studies have been completed.

* * * * *

Goodyear Aerospace Corporation, Geosciences Services, had a study of their side-looking radar imagery in the area of Humble's deep "strat" test in Township 8 South, Range 8 East, made recently by a consulting geologist. He mapped an anomaly, and subsequently learned that Humble had mapped a subsurface seismic anomaly in the same area.

GENERAL

Visitors to our office this past month included a Vernon W. Reid from Wichita, Kansas. He had a financial interest in some

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of the drilling exploration in the Strip Country of Arizona in the 1950's. He expressed some interest in investigating the possibilities of some exploratory drilling in the Basin and Range Province.

* * * * *

Dr. H. Wesley Peirce, Arizona Bureau of Mines, will present a paper dealing with salt masses in Arizona at the Fourth Annual Symposium on Salt, Houston, Texas, April 8-12, 1973.



J. N. C.

JNC:st

ACTIVITY REPORT

March 6, 1973

TO: Jack Conley

FROM: Edward A. Koester

Through the courtesy of the Department of Mineral Resources, I have been able to borrow several old Professional Papers and Bulletins of the U. S. Geological Survey which contain measured sections of Paleozoic and Mesozoic rocks. These sections have been incorporated into our system of outcrop sections and their location has been spotted on a working base map. In most instances the older measured sections have not been described as carefully as they have been by later workers. However, in some parts of the State these are the only published measured sections, so they are useful in isopachous studies of the major geologic systems. In many cases, the type sections of a major stratigraphic unit are poorly defined and the location of the section is vaguely given, but with the later information gleaned from Master's and Doctor's dissertations, which include re-measured sections, a better understanding of the thickness and character of these units can be obtained.

When this data is all assembled, we can then prepare more accurate isopachous maps of the geologic units than has previously been available. Several such maps should be completed by the end of this summer. Structural maps on the top of the Mississippian and top of the Precambrian can then be prepared with more confidence. Little attention to these structural datums has been paid in the past, except in limited areas.

EAK:st

ACTIVITY REPORT

March 6, 1973

TO: Jack N. Conley

FROM: James R. Scurlock

Gary Spraul with Mobil in Houston has requested logs and all information, including samples, on three wells in Yuma County. They seem to be focusing on this area. I gather in talking with Dr. Dick Rush that, in addition, they are still engaged in making a geologic reconnaissance of southeastern Arizona. At the moment apparently Dick is busy flying some of the Mobil brass over the area in which he has been doing reconnaissance on the ground. Thus, Mobil is still snooping around.

Warren Carr has requested all information on the Lockhart 1 Aztec located on the Snowflake Anticline. This deep well was reported to have a show of gas. Mr. Carr is trying to promote a well in this area.

JRS:st

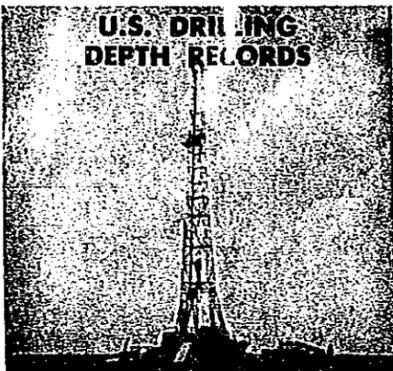
1 CLAIMS PAID YEAR TO DATE	2 OBJECT CODE NO.	3 DISTRIBUTION OF EXPENDITURES CLASSIFICATION	4 CLAIMS PAID MONTH OF Feb 1973
960 00	7111	1 Per Diem: Commission Members	210 00
60,256 42	7112	2 Salaries: Employees	7,605 24
243 02	7151	3 Industrial Insurance	
1,782 21	7153	4 F.I.C.A.	444 18
3,013 22	7155	5 Retirement	380 30
680 24	7156	6 Health Insurance	150 06
157 50	7159	7 Personnel Commission	82 25
	8		
	7215	9 Professional Services: Engineer	
1,420 00	7219	10 Professional Services: Other	528 00
	11		
451 40	7221	12 Travel - State: Mileage	87 80
1,072 00	7222	13 Subsistence	106 00
	7223	14 Public Transp.	
996 92	7224	15 Vehicle Expense	172 35
50 25	7225	16 Reg. Fees; Parking; etc.	45
	17		
344 00	7232	18 Travel - Out of State: Subsistence	
621 35	7233	19 Public Transp.	
	7234	20 Airport Parking	
89 75	7235	21 Reg. Fees; Telephone; etc.	
	22		
18,494 60	7251	23 Occupancy: Office Rent	1,849 46
	7261	24 Warehouse Rent	
	7263	25 Warehouse Mtn. & Repair	
268 00	7272	26 Mtn. & Repairs: Furn. & Equip.	
1,587 42	7280	27 Office Supplies	257 84
1,063 50	7300	28 Field Supplies; Film; Am.Strat; P.I., etc.	43 57
1,218 59	7331	29 Printing: Reports; Large Maps; etc.	125 84
	7332	30 Legal Advertisement	
24 50	7333	31 Court Reporter, Notary Commission, etc.	
420 69	7334	32 Postage	
1,464 53	7335	33 Telephone	168 31
17 82	7337	34 Drayage; Express; etc.	
67 27	7349	35 Rental, Misc.	
72 50	7360	36 Dues & Subscriptions	
	37		
96 54	7431	38 Capital Outlay: Office Equip; Ipr; etc.	96 54
	7434	39 Spec. Equip. (Geol.)	
	7436	40 Automobile	
	41		
250 00	7913	42 Revolving Fund	
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97,104 24		TOTAL	12,308 19

Ann

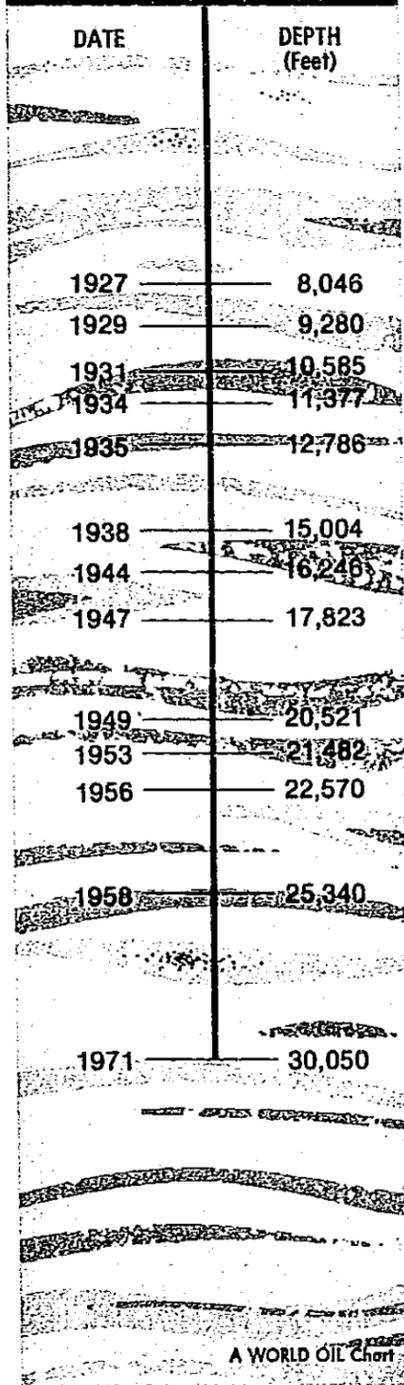
Reproduce pp. 74 & 75

84 & 85 for

Comm. — Put orig
in my meeting folder



Six wells set new drilling depth records



THE BADEN 1, Beckham County, Oklahoma, has extended its own record as the deepest well ever drilled, going to TD of 30,050 feet. Five other states registered new record wells in 1972 and one previously unrecorded record from 1971.

In Mississippi, a newly reported depth record of 23,455 feet reached in 1971 at the Shell-Murphy 22-7 U.S.A, Wayne County, replaces the previous record of 22,736 feet by Shell Oil's McNair 1, 13-4n-4w, Hinds County.

The new Utah record of 20,053 feet was set last year by Continental

Oil Co.'s Federal-Conoco 22-1, Uintah County. The old record was 17,910 feet set in 1969. Columbia Gas Transmission Corp. Min. Tr. 10 (9674-T), Mingo County, West Virginia, has set a new state depth total of 18,554 feet, and was drilling at press time.

Phillips Petroleum Co. C-1 Seminole Tribe, at 17,025 feet in Florida, Exxon Co.-U.S. State (32)-1, Pima County, Arizona, TD of 12,556 feet, and General Electric Co. WD-2, Posey County, Indiana, at 7,980 feet, complete the list of new records.

Holders of Record as Deepest Test Drilled
(Includes Both Dry and Producing Wells)

Year	Company, Well and Location	Feet
1927	Chansler-Canfield-Midway Oil Co.'s Olinda 96, Olinda, California	8,046
1928	Texon Oil and Land Co.'s University 1-B, Big Lake, West Texas	8,523
1929	Shell Oil Co.'s Nesa 1, Long Beach California	9,280
1930	Standard Oil Company of California's Mascot 1, Midway, California	9,753
1931	Chansler-Canfield-Midway Oil Co.'s Hobson A-2, Rincon field, Ventura County, Calif.	10,030
1931	Penn-Mex Fuel Co.'s Jardin 35, State of Vera Cruz, Mexico	10,585
1933	North Kettleman O. & G. Co.'s (later Union Oil's Lillis-Welch 1) Kettleman Hills, Calif.	10,944
1934	General Petroleum Corp.'s Berry 1, Belridge, Kern County, California	11,377
1935	Gulf Oil Corp.'s McElroy 103, Gulf-McElroy, Upton County, W. Texas	12,786
1938	Continental Oil Co.'s KCL A-2, Wasco, Kern County, California	15,004
1944	Phillips Petroleum Co.'s Price 1, Wildcat, Pecos County, West Texas	15,279
1944	Standard Oil Co. of California's KCL 20-13, South Coles Levee, Kern County, California	16,246
1945	Phillips Petroleum Co.'s Schoeps 3, Wildcat, Brazos County, Gulf Coast, Texas	16,655
1946	Pacific Western Oil Corp.'s National Royalties 1, Miramonte area, Kern County, Calif.	16,668
1947	Superior Oil Company of California's Weller 51-11, Wildcat, Caddo County, Okla.	17,823
1949	Superior Oil Company of California's Limoneria 1, Wildcat, Ventura County, Calif.	18,734
1949	Superior Oil Company of California's Unit 1, Wildcat, Sublette County, Wyoming	20,521
1953	Ohio Oil Co.'s Kern County Lands "A" 72-4, Paloma field, Kern Co., California	21,482
1956	Richardson & Bass, Freeport Sulphur & J. W. Mecom's Humble-L.L.&E. 1-L, Plaquemines, S. Louisiana	22,570
1958	Phillips Petroleum's University EE-1, Wildcat, Pecos County, West Texas	25,340
1970	Placid Oil Co.'s S.L. 5407 Lake Borgne, St. Bernard Parish	25,600
1972	Ralph Lowe Estate 1-17 University, Pecos County, West Texas	28,500
1972	Baden 1, Beckham County, Okla.	30,050

Regional Drilling Depth Records in the United States

State or District	Total Depth	Year	WELL AND LOCATION	Formation
Oklahoma	30,050	1972	Lone Star Producing Co. 1 Earnest R. Baden Unit, se28-10n-22w, Beckham County	
West Texas	28,500	1972	Ralph Lowe Estate 1-17 University, Pecos County	Ellenburger
S. La. Onshore	25,600	1970	Placid Oil's S.L. 5407 Lake Borgne, St. Bernard Parish	Unknown
S. Tex. Dist. 1	24,220	1965	Phillips' 1 Nueces A, McMullen County	Jurassic
S. Tex. Dist. 2	23,885	1965	Amerada's R. F. Talley 1, Victoria County	L. Tertiary
Mississippi	23,455	1971	Shell—Murphy 22-7 U.S.A., 22-6n-8w, Wayne County	Norphlet
Tex. Gulf Coast	22,971	1965	Falcon Seaboard's 2 Baer Ranch "A" Matagorda County	L. Tertiary
New Mex., S. E.	22,926	1968	Skelly Oil Co. Mexico "P" Federal 1, Lee County	Ellenburger
S. La.-Offshore	22,840	1968	Gulf Oil's S-L-3529, No. 7, W. Delta Block 27	Miocene
California	21,482	1955	Ohio Oil's KCL "A" 72-4, Paloma field, Kern County	L. Miocene
Alabama	21,138	1971	Tyler Odom 1, Washington County	Jurassic
Tex. Panhandle	20,916	1968	Phillips' Bowers "F" 1, Hemphill County	Devo-Silurian
Southwest Texas	20,603	1960	Hunt Oil Company's J. O. Walker 1, Webb County	Edwards
Wyoming	20,521	1949	Superior of Calif.'s Unit 1, Pacific Creek area, Sublette County	U. Cretaceous
East Texas	20,325	1968	Shell's E. W. Barrett 2, Hill County	
Utah	20,053	1972	Continental Oil Co.'s Federal-Conoco 22-1, Uintah County	Red Wall
Colorado	19,710	1967	Mobil's Piceance Creek 52, Rio Blanco County	Weber
Pennsylvania	18,834	1966	Consol. Gas Supply Corp. et al Pa. Dept. of Forest and Waters Tract 129 No. 1 well, Potter County	Cambrian
West Virginia	18,554*	1972	Columbia Gas Transmission Corp. Min. Tr. 10 (9674-T), Mingo County	Cambrian
North Texas	18,008	1960	Grande Corp's Harsh-Barger 1, Grayson County	Ordovician
Alaska	17,658	1970	Atlantic Richfield's Nora Federal 1, Sec. 5 t2n-r14e, Umiat Meridian	Unknown
N. Louisiana	17,138	1964	Shell-Ashland L. A. Moreau 1, Avoyelles Parish, Sec. 82-2n-4e	Tuscaloosa
Florida	17,025	1972	Phillips Petroleum Co. C-1 Seminole Tribe	Jurassic (?)
Arkansas	16,611	1967	Humble's Georgia-Pacific 1, Ashley County	Pennsylvanian
North Dakota	15,135	1959	Amerada's Antelope Unit 1-A, 1-152n-95w, McKenzie County	Cambrian
Montana	14,519	1970	Humble Oil's 75-1 Glacier County	Mississippian
N. Mex. N. W.	14,423	1961	El Paso's 29-5 Unit 50, Rio Arriba County	Granite
Virginia	14,176	1965	Shell Oil's R. J. Whetzel 1, Rockingham County	Cambrian
Nevada	13,832	1971	A. Paul Sutherland 1, Nye County	
New York	13,500	1958	New York State Nat. Gas' R. Olin 1, Woodhull Twp., Steuben County	Potsdam
Wash., Offshore	13,179	1966	Shell Oil's LA-ET, 10 mi. off Pacific Cty. coast	
Kentucky	13,170	1959	United Fuel Gas Co.'s James 1, Martin County	L. Cambrian
Illinois	13,651	1965	Texaco's E Cuppy 1, Hamilton County	Granite
Michigan	12,996	1964	Brazos, Sun, Superior State-Foster 1, Ogemaw County	Cambrian
Washington	12,920	1963	Phillips Petroleum's State 1, Pierce County	Puget Group (Eocene)
Oregon	12,880	1956	Sinclair's Federal-Mapleton 1, 12-16s-10w, Lane County	Eocene
Idaho	12,844	1951	Phillips & Utah Southern's Unit 1, 10-14s-30e, Oneida County	
Arizona	12,556	1972	Exxon Co.—U.S.A. State (32)-1, Pima County, Nelson 5-16s-15e	Unknown
Ohio	11,442	1967	Amerada's Robert Ullman 1, Elk Tp., Noble County	Cambrian
Tennessee	10,748	1967	Gulf Oil's Spinks 1, 25-2s-13e, Henry County	
North Carolina	10,054	1946	Standard of New Jersey's Cape Hatteras 1, Dare County	Granite
South Dakota	9,433	1954	W. H. Hunt-Z. Brooks Federal 1, Perkins County	Ordovician
Nebraska	8,875	1957	Shell's Schneider 2, 26-15n-56w, Heidemann Field, Kimball County	Pre-Cambrian
Kansas	8,713	1964	Mobil Oil, Cunningham Est. 1, 13-34s-37w, Stevens County	Granite
Maryland	8,700	1966	Cumberland and Allegheny Smith-Kerr Unit, well 604, Garrett County	Helderberg
Indiana	7,980	1972	General Electric Co. WD-2, 19-7s-13w, Posey County	Knox
Georgia	7,620	1962	C. E. Prince Spindle Top No. 3 Seminole County	L. Cretaceous
Iowa	5,305	1930	Oil Development Co.'s Wilson 1, Page County	Pre-Cambrian
Vermont	5,075	1959	Gregorie 1, Malletts Bay, Lake Champlain	Stony Point
New Jersey	5,022	1928	W & K Oil Co.'s Well 1, Jackson Mills area, Ocean County	Granite
Missouri	4,902	1966	Mammoth Prod. Co. 1 Big Oak Farms, Mississippi County	Roubidoux
Wisconsin	4,405	1949	Wisconsin Oil Refining Co., Jensema 1, Gibbsville	
Delaware	3,012	1935	Od23-2, Bridgeville	Potomac
Minnesota	2,843	1965	Lonsdale 65-1, 14—112n—21w	Solar Church

* Still drilling at press time.

DEEP WELL REPORT

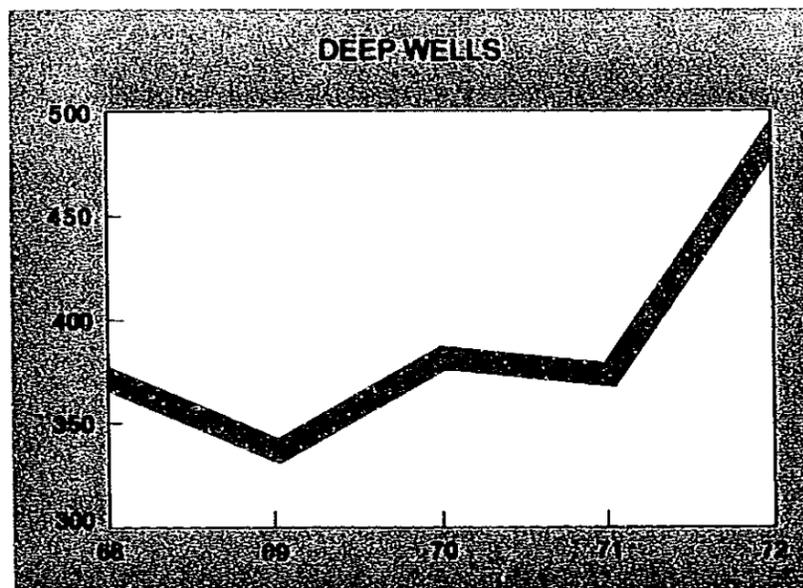
484 wells set new high mark

MORE U.S. WELLS were drilled below 15,000 feet in 1972 than in any previous year since WORLD OIL began recording deep wells in 1966. The record 484 deep holes last year exceeded the 1971 total by 113.

Major increases were recorded in Florida, where 50 more deep wells were drilled for a total of 77; Louisiana, with 194 compared to 1971's 153; Alabama, up to 22 from 7; Utah, rising 10 wells to 13, and Oklahoma's increase of 12 from 16. Smaller upturns occurred in California, whose total of 8 reflected an upturn of 3 from last year; and Alaska, up 1.

Declines were reported in Texas, down 18 from 111, and Mississippi, with one fewer than 1971's 42 deep wells.

Most wells—66.9%—were drilled to between 15,000-16,999 feet.



U.S. Wells Drilled to 15,000 Feet and Deeper (by Depth Brackets) in 1972

Depth Bracket (feet)	Ala-bama	Alaska	Calif-ornia	Florida	Loui-siana	Missis-sippi	New Mexico	Okla-homa	Texas	Utah	Wyo-ming	U.S. Total 1972	U.S. Total 1971
15,000—15,999.....	10	1	6	45	74	23	3	9	9	6	1	187	120
16,000—16,999.....	8	1	2	30	69	9	...	4	12	1	1	137	93
17,000—17,999.....	4	...	...	2	30	5	...	3	22	5	...	71	52
18,000—18,999.....	...	...	...	...	10	1	...	1	9	...	1	22	33
19,000—19,999.....	...	...	...	...	7	1	...	5	7	...	...	20	21
20,000—20,999.....	...	...	...	...	2	2	...	2	8	1	...	15	14
21,000—21,999.....	...	...	...	...	2	...	...	1	7	...	...	10	11
22,000—22,999.....	...	...	...	...	...	...	...	...	16	...	...	16	24
23,000—23,999.....	...	...	...	...	...	...	...	...	2	...	...	2	3
24,000—24,999.....	...	...	...	...	...	...	...	2	...	...	...	2	...
28,000—28,999.....	...	...	...	...	...	...	...	...	1	...	...	1	...
30,000—30,999.....	...	...	...	...	...	...	...	1	...	...	...	1	...
Total.....	22	2	8	77	194	41	3	28	93	13	3	484	371

Rotary rig activity rebounds

THREE TIMES as many states—16—reported increased 1972 average rotary drilling rig activity as registered declines. A total of 141 more rotaries were working in the United States last year, compared to 1971's total

of 1,235—an 11.4% upturn.

Texas and Louisiana led all states in rotary activity with 361 and 237 rigs, respectively. The largest annual increase was in Pennsylvania, up 68 rigs. Wyoming, with 19 more rotaries;

Utah, with 17 additional; and New Mexico, a total of 10 more, also reported substantial increases. Smaller rises in average rig activity came in Alabama, to 17 from 9; Colorado, up 8 from 29; Florida, with 5 more

trict 5 (East Central), from 62 to 70; District 7-B (North Central), 10 added wells to a total this year of 285; District 7-C (West Central), 21 more wildcats, to 170; and District 9 (North), up 6% to 195 total wells. Each Louisiana district, it is anticipated, will record additional explora-

tory wells this year compared to 1972, with offshore drilling leading the way —up 12.4%, to 380 new wildcats.

Major percentage increases in other large wildcatting states are forecast for New Mexico, Michigan and North Dakota at 12.2%, 21.2% and 29.0%, respectively for totals of 230, 160 and

80 new wildcats each.

The only states expecting decreases are California, slipping to 150 from 152 wildcats, Florida, down 10 wells from last year's 35, Tennessee, with the largest percentage downturn of 21.9% to a predicted 25, and South Dakota, 1 less well than last year.

PRODUCTION

Texas leads U.S. oil output rise

U.S. CRUDE OIL production increased slightly last year, rising to 9,477,570 bpd from 9,462,780 bpd in 1971. This nation-wide rise is due to a 191,530 bpd boost in Texas output, resulting from the 100% allowables in the second part of 1972. Seven other states reporting crude production increases in 1972 were:

- Alabama—up 27.1% to 27,190 bpd

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WORLD OIL
P.O. Box 2608
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U.S. Crude Oil Production, by States and Districts
(Source: U.S. Bureau of Mines, except last 3 months of 1972 API)

STATE or DISTRICT	Barrels Daily (in thousands)		Barrels Annually (in thousands)		% Diff.
	1972	1971*	1972	1971*	
Alabama.....	27.19	21.46	9,952	7,832	+ 27.1
Alaska.....	200.83	217.79	73,502	79,494	- 7.5
Arizona.....	2.84	3.39	1,038	1,236	- 16.0
Arkansas.....	50.48	50.04	18,476	18,263	+ 1.2
California.....	950.92	982.15	348,038	358,484	- 2.9
Colorado.....	87.28	75.01	31,946	27,391	+ 16.6
Florida.....	43.20	14.65	15,814	5,347	+295.8
Illinois.....	96.68	107.08	35,384	39,084	- 9.5
Indiana.....	17.01	18.24	6,226	6,658	- 6.5
Kansas.....	203.24	215.16	74,385	78,532	- 5.3
Kentucky.....	26.77	29.29	9,798	10,692	- 8.4
Louisiana.....	2,482.65	2,562.31	908,651	935,243	- 2.8
North Louisiana.....	121.42	124.43	44,440	45,415	- 2.1
South Louisiana.....	2,361.23	2,437.88	864,211	889,828	- 2.9
Michigan.....	35.67	32.58	13,055	11,893	+ 9.8
Mississippi.....	167.86	175.52	61,438	64,066	- 4.1
Missouri.....	.18	.18	65	66	- 1.5
Montana.....	92.45	94.79	33,835	34,599	- 2.2
Nebraska.....	25.17	27.57	9,213	10,062	- 8.4
Nevada.....	.25	.31	93	113	- 17.7
New Mexico.....	302.16	324.42	110,592	118,412	- 6.6
Southeast New Mexico.....	277.36	300.27	101,515	109,597	- 7.4
Northwest New Mexico.....	24.80	24.15	9,077	8,815	+ 3.0
New York.....	2.53	3.09	925	1,126	- 17.9
North Dakota.....	56.12	59.32	20,539	21,653	- 5.1
Ohio.....	21.55	22.70	7,886	8,286	- 4.6
Oklahoma.....	564.84	584.42	206,731	213,313	- 3.1
Pennsylvania.....	10.16	10.41	3,719	3,798	- 2.1
South Dakota.....	.70	.64	255	233	+ 9.4
Tennessee.....	.96	1.09	351	398	- 11.8
Texas.....	3,542.01	3,350.48	1,296,376	1,222,926	+ 6.0
Districts—					
1: South Central.....	67.74	61.89	24,793	22,591	+ 9.7
2: Middle Gulf.....	223.69	209.39	81,872	76,428	+ 7.1
3: Upper Gulf.....	492.60	444.85	180,293	162,369	+ 11.0
4: Lower Gulf.....	188.76	211.92	69,087	77,349	- 10.7
5: East Central.....	59.37	73.75	21,728	26,920	- 19.3
6: Northeast.....	456.22	389.34	166,976	142,109	+ 17.5
7-B: North Central.....	104.00	99.97	38,062	36,490	+ 4.3
7-C: West Central.....	101.16	118.35	37,025	43,200	- 14.3
8: West.....	1,645.39	1,527.30	602,212	557,464	+ 8.0
9: North.....	135.25	142.07	49,501	51,855	- 4.5
10: Panhandle.....	67.83	71.65	24,827	26,151	- 5.1
Utah.....	70.83	64.74	25,923	23,630	+ 9.7
Virginia.....	.....	.....	1	1	.....
West Virginia.....	7.32	8.13	2,678	2,969	- 9.8
Wyoming.....	387.72	405.79	141,907	148,114	- 4.2
Total United States..	9,477.57	9,462.78	3,468,792	3,453,914	+ 0.4

* Revised

- Arkansas—50,400 bpd compared to 50,040 bpd
- Colorado—with an added 12,240 bpd from 1971's 75,040 bpd
- Florida—the largest increase, 295.8% to a total 43,200 bpd
- Michigan—up to 35,670
- Utah—from 64,740 bpd to 70,830 bpd
- South Dakota—9.4% more.

The major producing areas of Louisiana, Oklahoma and New Mexico declined 2.8%, 3.1% and 6.6% respectively.

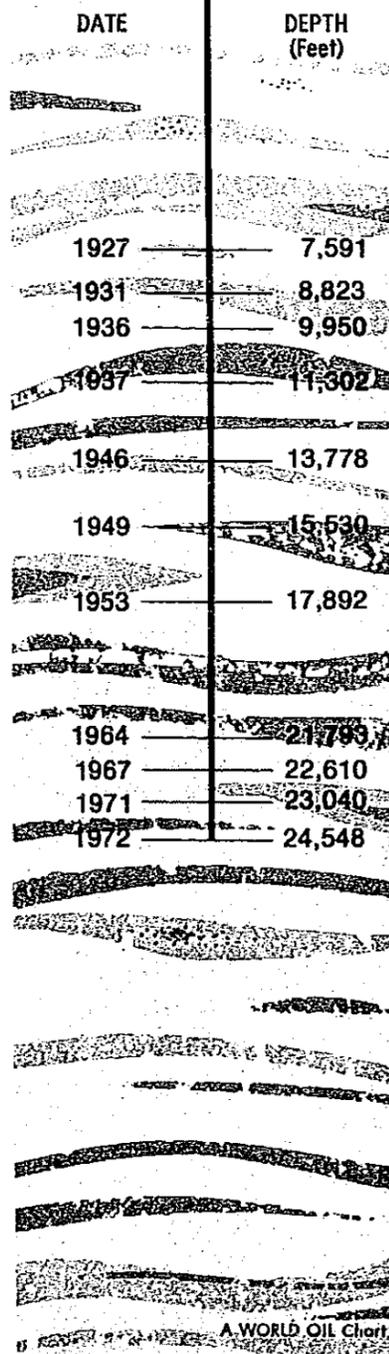
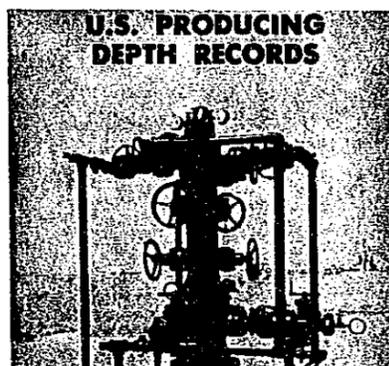
New deepest producer, area records reported

A NEW PRODUCING depth record was established in 1972 by Union Oil Co. of California's Bruner 1-33, NW SE NE, 33-11n-25w, Beckham County, Oklahoma. The Hunton gas well produced from 24,548 feet, or 1,508 feet lower than the Texaco E. Riggs Unit 1, Pecos County, Texas. This makes Beckham County, Oklahoma, the record holder for deep

Holders of Record as Deepest Producing Well in U.S., Since 1938

Year Drilled	WELL AND LOCATION	Production	Producing Depth (Feet)*
1938	Fohs Oil Co.'s Buckley-Bourg 1, DeLarge field, South Louisiana.....	*Cond.	13,266
1943	Union Producing Co.-Fohs Oil Co.'s Fitzpatrick-Vizard 1, DeLarge field, South Louisiana.....	*Cond.	13,490
1944	Union Producing Co.-Fohs Oil Co.'s Buckley-Bourg 2, DeLarge field, South Louisiana.....	Oil	13,503
1945	Shell Oil Co.'s Smith-State Unit 1-1, Weeks Island field, South Louisiana.....	Oil	13,520
1946	Shell Oil Co.'s Smith-State Unit 1-2, Weeks Island field, South Louisiana.....	Oil	13,778
1947	Shell Oil Co.'s Smith-State Unit 1-3, Weeks Island field, South Louisiana.....	Oil	13,888
1947	The Texas Co.'s LaFourche Basin Levee Dist. 1, Queen Bess Island field, South Louisiana.....	*Cond.	13,904
1948	Pure Oil Co.'s Unit 1, West Poison Spider field, Wyoming	Oil	14,307
1948	Denver Producing & Refg. Co.'s School Land 1-A, Cogar field, Caddo County, Okla.....	Gas	15,510
1949	Standard Oil Co. of California's Mushrush 5, Wasco field, Kern County, California.....	Oil	15,530
1953	Shell Oil Co.'s Weeks-Gall Unit 1-1, Weeks Island field, South Louisiana.....	Oil	17,122
1953	Shell Oil Co.'s Gonsoulin Minvielle-State 2, Weeks Island field, South Louisiana.....	Oil	17,306
1953	Richfield Oil Corp.'s Cole Levee "A" 67-29, Coles Levee, North field, California.....	Oil	17,892
1956	Richardson & Bass et al's Humble-LL&E 1-L, Lake Washington field, South Louisiana.....	Oil	21,465
1964	Forest Oil Co. and Robert J. Zonne et al's Charles J. Walker 1, Pecos County, West Texas.....	Gas	21,793
1965	Union Oil Co. of Calif.'s No. 1 W. C. Tyrrell Unit 3, Pecos County, West Texas.....	Gas	22,032
1967	Humble Oil & Refining Co.'s Henry Willbanks 11, Gomez field, Pecos County, West Texas.....	Gas	22,610
1968	Gulf Oil Corp.'s "DD" Unit 1, Gomez field, Pecos County, West Texas.....	Gas	22,752
1971	Texaco's E. Riggs Gas Unit 1.....	Gas	23,040
1972	Union Oil Co. of California Bruner 1-33 NW SE NE, 33-11n-25w Beckham County.....	Gas	24,548

* Bottom of perforated interval or bottom of open hole completion interval.



Regional Producing Depth Records in the United States

State or District	Producing Depth (Feet)*	Year Drilled	Wells and Location	Producing Formation	Production
Oklahoma.....	24,548	1972	Union Oil Co. of Cal. Bruner 1-33, NW SE NE, 33-11n-25w, Beckham County.....	Hunton	Gas
West Texas...	23,040	1971	Texaco's E. Riggs Gas Unit 1, Pecos.....	Ellenburger	Gas
S. La.-Onshore.	21,862	1969	Texaco Caillou Island S.L. 4666 #1.....	.....	Gas
S. La.-Offshore.	20,500	1971	Hunt Oil's S.L. 5015, Grand Isle, Blk. 25.....	Miocene	Gas
Mississippi....	20,451	1969	Shell Oil's Garrett 1 Sec. 28 t4n-r3e.....	Smackover	Gas
Tex. Panhandle	19,876	1967	Union Oil Co. of California's Bradstreet Unit 1-89, Hemphill County....	Devo-Silurian	Gas
Wyoming.....	18,200	1968	Montana Fuel Supply Church Buttes, Unit 19, Sweetwater County.....	Morgan	Gas
Texas G. Coast	18,080	1967	Tenneco's American Fletcher 1, Brazoria County.....	L. Frio	Gas
N. Mex., S.E..	17,684	1964	Pure Oil's Red Hills Unit 1, Lea County.....	Devonian	Gas
North Texas...	16,555	1960	Standard of Texas' McAdams 1-3, et al Tr. 3, Grayson County.....	Ordovician	Cond.
South Texas...	16,521	1961	Pure Oil's E. E., Kolar 1, Vienna field, Lavaca County.....	Wilcox	Cond.
Florida.....	16,135	1972	Humble Oil & Refining Co., 1 St. Regis Paper Co. 13-3.....	Norphlet	Oil
Alabama.....	16,114	1971	Phillips' Williams "AA" 1, Washington County.....	Jurassic	Cond.
Utah.....	15,798	1968	Phillips Petroleum's Bridger Lake Unit A-4, Summit County.....	Dakota	Oil
California....	15,343	1960	Standard Oil of Calif.'s Burson 1, Fillmore field, Ventura County.....	Pliocene	Oil
S.W. Texas....	14,940	1960	Mobil Oil's L.M. Morrison 1, Morrison field, Val Verde County.....	Ellenburger	Cond.
North Dakota.	14,040	1958	Amerada's Beaver Lodge Unit 2, Williams County.....	Ordovician	Cond.
East Texas....	13,485	1968	Sun Oil Co.'s Travis Gas Unit "A" 1, Van Zandt County.....	Smackover	Gas
Montana.....	12,850	1967	Superior, Consolidated O. and G. Christianson 1, Richland County.....	Red River	Oil
N. Louisiana..	12,430	1969	Pennzoil Prod.'s Smk. SUH, McGehee 1 S. Downsville field, Lincoln Parish	Smackover	Gas
Pennsylvania..	11,458	1964	New Penn Dev. et al, Leo F. Heyn 1, Fayette County.....	Tuscarora	Gas
Alaska.....	11,235	1957	Standard of Calif.-Richfield's Swanson River Unit (1) 34-10.....	Hemlock, Eoc.	Oil
Arkansas.....	11,195	1969	W. H. Hunt's Harold Nations 1, Columbia County.....	Smackover	Cond.
N. Mex.-N.W..	10,958	1971	Tenneco's Pah 1, L. 3-25-11.....	Paradox	Oil
Colorado.....	9,428	1959	El Paso's Hodges Pool Unit 1, La Plata County.....	Paradox	Gas
S. Dakota....	9,114	1972	Quadrant 33-28 Buckley.....	Red River	Oil
Maryland.....	8,658	1966	Cumberland and Allegheny Smith-Kerr Unit, Well 604, Garrett County..	Oriskany	Gas
Nevada.....	8,581	1967	Texota's Eagle Springs Unit 1-34, Nye County.....	Tertiary	Oil
W. Virginia...	8,410	1946	Ohio Oil's Kuykendall et al 1, Canaan Valley field, Tucker County.....	Oriskany	Gas
Ohio.....	8,114	1968	East Ohio Gas Co. E.E. Denny 1, Knox Tp., Columbiana County.....	Cambro-Ordo.	Gas
Kentucky.....	7,598	1967	Inland Gas Co.'s L. O. White #529, Boyd County.....	L. Cambrian	Oil
Nebraska.....	7,438	1964	Braden Oil Co.'s State 1, Kimball County.....	Dakota "J"	Oil
Michigan.....	7,157	1970	Shell Oil's Longfield 128 Sec. 28, t27n7w, Kalkaska County.....	Niagaran	Gas/Cond.
Arizona.....	6,793	1960	Texaco 1, Navajo Z, wildcat, Apache County.....	Devonian	Oil
Kansas.....	6,774	1967	Mobil Oil's Creamer Est. 1, 13-34s-37w, Stevens County.....	St. Louis	Gas
Virginia.....	6,158	1954	Clinchfield Coal's Std. Banner Coal 152, Ervington dist., Dickenson Co..	Devonian	Gas
New York.....	5,425	1963	Transamerican Petroleum's L. Wellman 1, Middlebury Twn., Wyoming County.....	Theresa	Gas
Illinois.....	5,363	1961	Cities Service Marie Vaught 9, Goldengate Consol. Pool, Wayne County.	Devonian	Oil
Washington...	3,958	1957	Sunshine Mining's J.W. Tanner-Medina 1, Grays Harbor County (Abd.)	Oligocene	Oil
Indiana.....	3,911	1972	Rush Creek Oil Co. Inc.—S. Klein & State of Indiana 1-C, Pary County	Harrodsburg	Oil
Tennessee....	3,107	1954	Spencer Consol. Pool	Chattanooga	Gas
Greenup-David et al's Coal Creek 1, Briceville field, Anderson County...					
Missouri.....	2,975	1959	Wm. Grunewald's Currie 1, Holt County (abandoned).....	Ordovician	Oil
Iowa.....	994	1963	Nat. Gas Pipeline's Am. Flynn P-1, Sec. 20, t76n, r9w, Washington County.....	Platteville	Oil

* Bottom of perforated interval or bottom of open hole completion interval.

wells, since the deepest well ever drilled, Baden 1, also is in the county (please see Page 74).

Elsewhere, three more regional producing depths were set. South Louisiana onshore's Texaco Caillou Island 21,465 feet.

South Dakota's Depco Federal 42-27, an oil well at 9,070 feet, was superseded by Red River oil producer Quadrant 33-28 Buckley at 9,114 feet.

In Indiana, a Spencer Consolidated Pool well broke the record of 3,493 feet.

Artificial lift: down slightly in '73

WORLD OIL ESTIMATES that 13,185 U.S. oil wells will be placed on some form of artificial lift this year. The U.S. producing industry also is expected to spend some \$91.5 million for equipment to maintain pumping and gas lift completions that will be operating during the year.

Fewer wells went on lift in 1972 than in the previous year—13,661 compared to 15,118 in 1971. As indicated in the table, this downward trend is expected to continue this

year—but at a lesser rate—due principally to reduced artificial lift completions anticipated in South Louisiana.

Forecast by states. Texas is expected to put 5,720 wells on artificial lift in 1973, and almost \$32.6 million will be spent by producers in maintaining these new artificial lift wells and the 148,689 completions already provided with lift equipment. Thus, more than 35% of the total U.S. arti-

ficial lift maintenance expenditures will be made in Texas.

As a further example of Texas' lead in the field, it is estimated that more wells will again be placed on lift this year in Railroad Commission District 8 (West Texas) alone, than in any other entire state. In 1972, 5,624 wells went on lift in Texas.

Louisiana, with 2,166 wells, and California, with 1,053 wells, were ranked second and third in the number of lift installations made in 1972.

Rankings differ according to anticipated maintenance expenditures. In this category, California is second to Texas with \$18.2 million, followed by Oklahoma with \$10.2 million, Kansas with \$6.16 million and Louisiana with \$4.8 million.

1973 Artificial Lift Estimates

STATE or DISTRICT	Wells to go on Artificial Lift in 1973	Wells Put on Pump or Lift in 1972	New Oil Wells Completed in 1972	Number Flowing Oil Wells End of 1972	Oil Wells on Artificial Lift End of 1972	Net Wells Shut in or Abandoned in 1972	1973 Maintenance Cost for Art. Lift Wells (Equipment only)
Alabama.....	14	12	10	27	499	22	\$ 156,500
Alaska.....	5	5	10	58	139	-4	71,000
Arkansas.....	101	99	108	69	7,168	17	1,153,000
California.....	1,264	1,053	1,034	421	39,865	1,346	18,200,000
Colorado.....	275	237	297	110	1,709	373	369,400
Illinois.....	230	214	214	.....	24,736	847	3,360,000
Indiana.....	80	77	77	.....	4,379	NA	530,000
Kansas.....	690	688	688	325	40,730	1,918	6,160,000
Kentucky.....	222	212	215	560	14,056	256	1,558,000
Louisiana.....	1,281	2,166	1,076	7,388	19,208	1,174	4,790,000
North Louisiana.....	364	342	308	308	12,843	-899	2,010,000
South Louisiana.....	917	1,824	768	7,080	6,365	2,073	2,780,000
(Inc. Offshore)							
Michigan.....	90	85	83	668	3,129	427	730,000
Mississippi.....	105	113	98	275	2,298	91	540,000
Montana.....	89	88	84	19	3,196	599	585,000
Nebraska.....	35	38	42	4	1,176	52	238,800
New Mexico.....	442	425	423	2,386	11,048	374	3,490,000
New York.....	85	76	76	.....	5,500	436	388,000
North Dakota.....	68	62	24	225	1,340	175	178,000
Ohio.....	510	520	515	295	14,491	410	1,474,600
Oklahoma.....	990	974	974	4,000	69,807	2,716	10,200,000
Pennsylvania.....	280	275	484	80	26,949	1,256	1,904,000
Texas.....	5,720	5,624	3,997	22,680	148,689	6,837	32,616,000
Districts—							
1: South Central.....	425	424	431	361	10,347	281	1,900,000
2: Middle Gulf.....	295	320	92	1,901	3,171	231	680,000
3: Upper Gulf.....	469	438	289	2,469	8,428	481	1,560,000
4: Lower Gulf-S.W.....	460	471	162	1,897	5,985	720	1,243,000
5: E. Central.....	79	77	18	228	2,727	79	709,000
6: Northeast.....	386	362	101	7,623	11,989	640	3,080,000
7-B: N. Central.....	536	530	412	770	10,755	575	2,480,000
7-C: W. Central.....	304	288	264	985	6,587	291	1,482,000
8: West.....	1,866	1,807	1,391	4,625	49,383	1,629	11,080,000
9: North.....	720	719	699	1,360	27,258	1,427	6,220,000
10: Panhandle.....	200	188	138	461	12,059	483	2,185,000
Utah.....	29	26	67	87	812	42	124,000
West Virginia.....	150	138	138	.....	13,530	208	1,088,400
Wyoming.....	350	394	344	600	8,350	644	1,535,000
Other States.....	80	60	61	85	339	NA	76,000
Total United States.....	13,185	13,661	11,139	40,362	463,143	20,216	\$91,516,700

NA—Not Available

Bill urges U.S. research on geothermal steam use

Rep. Sam Steiger, R-Ariz., yesterday announced he has introduced a bill in the House that would establish a five-year federal research program to put the Southwest's energy storehouse of geothermal steam to work.

Steiger said his proposal would encourage the development of reservoirs of geothermal steam, and provide loans to private firms engaged in tapping geothermal resources.

"This is the cheapest known energy source and the cleanest," Steiger said. "Geothermal power certainly takes on more importance as an energy source because of the growing energy crisis."

—Inestimable amounts of geothermal

energy lie waiting to be tapped in the West, experts believe.

Geothermal Kinetics Systems, developers of Arizona's first geothermal well near Williams Air Force Base, 20 miles southwest of Phoenix, reported last week it is producing superheated water which will be considered as a power supply for turning electric generators.

Steiger said geothermal energy is operating plants in northern California and Mexico. He said geothermal power has been used in Italy since the early 1900s.

"Steam power," Steiger said, "does not deplete scarce resources such as fossil fuels, nor does steam pollute," he said the wells could produce new water

supplies as well as energy.

THE ARIZONA REPUBLIC

3-12-73

Pg 29

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Geothermal Kinetics Systems, developers of Arizona's first geothermal well near Williams Air Force Base, 20 miles southwest of Phoenix, reported last week it is producing superheated water which will be considered as a power supply for turning electric generators.

Steiger said geothermal energy is operating plants in northern California and Mexico. He said geothermal power has been used in Italy since the early 1900s.

"Steam power," Steiger said, "does not deplete scarce resources such as fossil fuels, nor does steam pollute," he said the wells could produce new water supplies, as well as energy.

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