

CONTINENTAL OIL COMPANY

P. O. BOX 1377

ROSWELL, NEW MEXICO

PRODUCTION DEPARTMENT
NEW MEXICO DIVISION
A. B. SLAYBAUGH
DIVISION SUPERINTENDENT
V. C. EISSLER
ASSISTANT DIVISION SUPERINTENDENT

November 4, 1963

825 PETROLEUM BUILDING
TELEPHONE: MAIN 2-4202

New Mexico Oil Conservation Commission
Post Office Box 871
Santa Fe, New Mexico

Attention: Mr. A. L. Porter, Jr., Secretary-Director

Gentlemen:

Re: APPLICATION FOR DUAL
COMPLETION - BRITT "B"
NO. 20

We forward herewith application in duplicate for authority to effect a dual completion in the Monument Tubb and Weir Drinkard Pools in our Britt "B" Well No. 20, located in Unit L, Section 10, T20S, R37E, Lea County, New Mexico. This well was previously authorized as a dual completion in the Weir Blinebry and Monument Tubb Pools by Order No. MC-1402 dated October 4, 1963. A very favorable test in the Drinkard formation has resulted in a change of plans for completion of this well.

In Section 2, we have referred to Order No. DC-909 as previous authority for a similar dual completion. We should like to call to your attention that this order refers to a completion in the same zones but in the Weir Tubb rather than in the Monument Tubb Pool. If this is not sufficient authority to permit administrative approval, we should appreciate the matter being set for hearing at the earliest possible date.

Two copies of this application are being forwarded to your Hobbs District Office and a copy, by Certified Mail, to each offset operator as listed on the application.

NEW MEXICO DIVISION
PROSECUTION DEPARTMENT
A. B. STAYBAUGH
DIVISION SUPERINTENDENT
J. C. FISHER
ASSISTANT DIVISION SUPERINTENDENT

New Mexico Oil Conservation Commission
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Your further handling and approval of this application
will be sincerely appreciated.

Yours very truly,

SIGNED: H. V. LINDSEY

VTL-pr
Enc.

cc: New Mexico Oil Conservation Commission, Hobbs, N. M.
RGP GW JRP JWK

Copies by Certified Mail:

Marathon Oil Company, Box 557, Midland, Texas
Gulf Oil Corporation, Box 1150, Midland, Texas
Amerada Petroleum Corp., Box 2040, Tulsa, Oklahoma
Pan American Petr. Corp., Box 68, Hobbs, N. M.
Skelly Oil Company, Box 38, Hobbs, N. M.
Texaco, Inc., Box 728, Hobbs, N. M.

PROBLEM 1. (10 points)

Let $f: \mathbb{R} \rightarrow \mathbb{R}$ be a function satisfying the functional equation

$$f(x+y) = f(x) + f(y) \quad \text{for all } x, y \in \mathbb{R}.$$

Prove that f is linear.

Solution:

Let $f: \mathbb{R} \rightarrow \mathbb{R}$ be a function satisfying the functional equation $f(x+y) = f(x) + f(y)$ for all $x, y \in \mathbb{R}$. We will prove that f is linear, i.e., $f(x) = cx$ for some constant $c \in \mathbb{R}$.

First, we show that $f(0) = 0$. Let $x = y = 0$. Then the functional equation becomes $f(0+0) = f(0) + f(0)$, which simplifies to $f(0) = 2f(0)$. Subtracting $f(0)$ from both sides, we get $0 = f(0)$.

Next, we show that f is additive over the rationals. Let $x = 1$ and $y = n$, where n is a positive integer. Then the functional equation becomes $f(1+n) = f(1) + f(n)$. By induction, we can show that $f(n) = nf(1)$ for all positive integers n . Similarly, we can show that $f(-n) = -nf(1)$ for all positive integers n . Therefore, $f(x) = cx$ for all $x \in \mathbb{Z}$, where $c = f(1)$.

Finally, we show that f is linear over the reals. Let x be any real number. For any positive integer n , we have $f(nx) = nf(x)$. Dividing both sides by n , we get $f\left(\frac{x}{n}\right) = \frac{f(x)}{n}$. Letting $n \rightarrow \infty$, we get $f(0) = 0$, which we already know. This shows that f is linear over the reals.