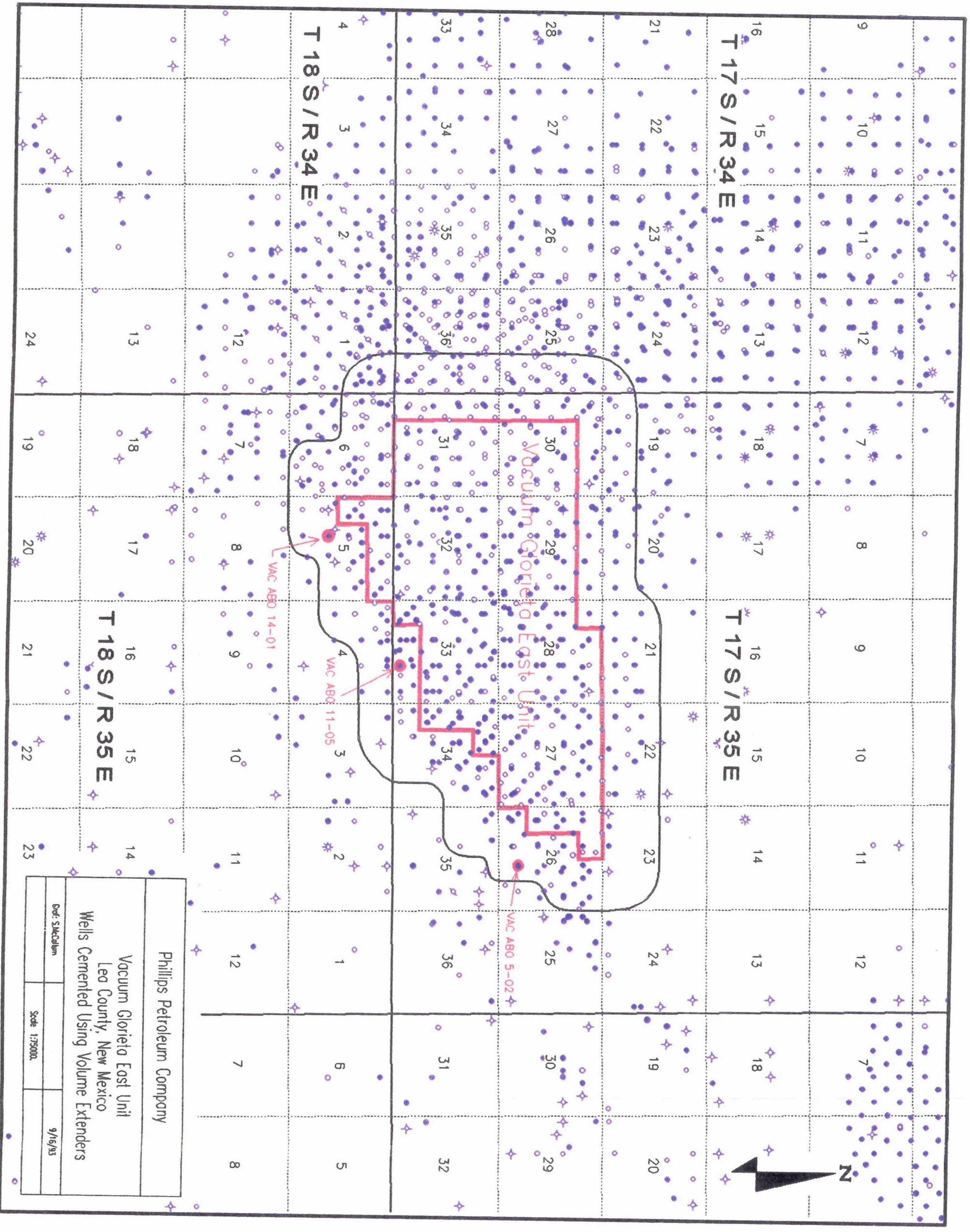




BEFORE EXAMINER CATANACH
OIL CONSERVATION DIVISION
PHILLIPS PETROLEUM COMPANY
EXHIBIT NO. 12
CASE NO. 10845 and 10846

PHILLIPS PET
VAC ABO UNIT TR5 NO. 2
API# 3002508549

0 - 322' 13.375" OD SURF CSG

0 - 322' 17.5 " OD HOLE

0 - 322' CEMENT 325 sx

0 - 3150' CEMENT 300 sx

0 - 3150' 8.625" OD INT CSG

322 - 3150' 12.25 " OD HOLE

TOP OF CEMENT AT 4175.4' ==>
USING ACTUAL SLURRY YIELD
AND ASSUMING 50 % EXCESS

990 FSL & 2195 FEL
SEC 26 , TWN 17 S, RANGE 35 E
ELEVATION: 3925 DF
SPUD DATE: 05-12-62
COMPLETION DATE: 06-19-62
COMPLETION INTERVAL: 8695 - 8851 (ABRF)

TOP OF CEMENT AT 6645' ==>
USING NMOC D METHOD

6645 - 8990' CEMENT 875 sx

8681 - 8851' CEMENT PLUG

8660 - 8676' PERFS

8695 - 8851' PERFS

0 - 8990' 4.5" OD PROD CSG

3150 - 9180' 7.875 " OD HOLE

PBTD: 8681'

TD: 9180'

PHILLIPS PET
VAC ABO UNIT TR11 NO. 5
API# 3002502991

0 - 318' 13.375" OD SURF CSG

0 - 318' 17" OD HOLE

0 - 318' CEMENT 300 sx

318 - 3166' CEMENT 750 sx

0 - 3166' 8.625" OD INT CSG

318 - 3166' 11" OD HOLE

3200 - 3200' PERFS SQZ W/ 595 sx

TOP OF CEMENT AT 3897.8' ==>
USING ACTUAL SLURRY YIELD
AND ASSUMING 50 % EXCESS

330 FSL & 1980 FEL
SEC 33, TWN 17 S, RANGE 35 E
ELEVATION: 3948 DF
SPUD DATE: 01-14-61
COMPLETION DATE: 02-28-61
COMPLETION INTERVAL: 8740 - 8780 (ABRF)

TOP OF CEMENT AT 7098' ==>
USING NMOC METHOD

7098 - 9003' CEMENT 500 sx

8785 - 8788' CIBP

8740 - 8780' PERFS

8735 - 8785' CEMENT PLUG

8682 - 8730' PERFS

0 - 9003' 5.5" OD PROD CSG

3166 - 9003' 7.875" OD HOLE

PBTD: 8735'

TD: 9003'

PHILLIPS PET
VAC ABO UNIT TR14 NO. 1
API# 3002503063

0 - 315' 13.375" OD SURF CSG

0 - 315' CEMENT 290 sx

0 - 3200' CEMENT 200 sx

0 - 3200' 8.625" OD INT CSG

TOP OF CEMENT AT 5304' ==>
USING ACTUAL SLURRY YIELD
AND ASSUMING 50 % EXCESS

TOP OF CEMENT AT 7007' ==>
USING NMOC METHOD

8190 - 8193' CIBP

0 - 9006' 4.5" OD PROD CSG

0 - 316' 17 " OD HOLE

316 - 3200' 11 " OD HOLE

1980 FSL & 1980 FWL
SEC 5 , TWN 18 S, RANGE 35 E
ELEVATION: 3959 KB
SPUD DATE: 06-18-61
COMPLETION DATE: 07-20-61
COMPLETION INTERVAL: 8728 - 8840 (ABRF)

7007 - 9006' CEMENT 690 sx

8250 - 8596' PERFS

8630 - 8712' PERFS

3200 - 9006' 7.875 " OD HOLE

8728 - 8840' PERFS

PBTD: 8190'

TD: 9006'

**VACUUM GLORIETA EAST UNIT
AREA of REVIEW**

Wells Cemented Using High Yield Cement Slurries

Vacuum Abo Unit Well No 5-02

Calculated Top of Cement using NMOCD method (1.32 ft³/sx yield and 50% excess):

Slurry Volume = (875 sx) X (1.32 ft³/sx) = 1155 ft³
Assume 50 % excess cement, (1155 ft³) X 0.5 = 577.5 ft³
4 1/2" casing set @ 8990' in 7 7/8" hole, Fill up = 4.3899 ft/ft³
(577.5 ft³) X (4.3899 ft) = 2535 ' of fill up
Top of Cement = (8990') - (2535') = 6455'

Calculated Top of Cement using actual Slurry Yields:

Slurry: 675 sx 50/50 poz w/ 18% gel, Yield: 2.74 ft³/sx
 200 sx Class "C" with 4% gel, Yield: 1.72 ft³/sx
Slurry Volume = (675 sx) X (2.74 ft³/sx) + (200 sx) X (1.72 ft³/sx) = 2193.5 ft³
Assume 50 % excess cement, (2193.5 ft³) X 0.5 = 1096.75 ft³
4 1/2" casing set @ 8990' in 7 7/8" hole, Fill up = 4.3899 ft/ft³
(1096.75 ft³) X (4.3899 ft) = 4814.6 ' of fill up
Top of Cement = (8990') - (4814.6') = 4175.4'

Vacuum Abo Unit Well No 11-05

Calculated Top of Cement using NMOCD method (1.32 ft³/sx yield and 50% excess):

Slurry Volume = (500 sx) X (1.32 ft³/sx) = 660 ft³
Assume 50 % excess cement, (660 ft³) X 0.5 = 330 ft³
5 1/2" casing set @ 9003' in 7 7/8" hole, Fill up = 5.7719 ft/ft³
(330 ft³) X (5.7719 ft) = 1905 ' of fill up
Top of Cement = (9003') - (1905') = 7098'

Calculated Top of Cement using actual Slurry Yields:

Slurry: 300 sx Class "C" w/40% Diacel "D" & 1/4 ft³/sx Strata-Crete 6, Yield:
 4.75 ft³/sx
 200 sx Class "C" with 4% gel, Yield: 1.72 ft³/sx
Slurry Volume = (300 sx) X (4.75 ft³/sx) + (200 sx) X (1.72 ft³/sx) = 1769 ft³
Assume 50 % excess cement, (1769 ft³) X 0.5 = 884.5 ft³
5 1/2" casing set @ 9003' in 7 7/8" hole, Fill up = 5.7719 ft/ft³
(884.5 ft³) X (5.7719 ft) = 5105.2 ' of fill up
Top of Cement = (9003') - (5105.2') = 3897.8'

VACUUM GLORIETA EAST UNIT

AREA OF REVIEW

Wells Cemented with High Yield Cement Slurries

Vacuum Abo Unit Well No 14-01

Calculated Top of Cement using NMOCD method (1.32 ft³/sx yield and 50% excess):

$$\text{Slurry Volume} = (690 \text{ sx}) \times (1.32 \text{ ft}^3/\text{sx}) = 910.8 \text{ ft}^3$$

$$\text{Assume 50 \% excess cement, } (910.8 \text{ ft}^3) \times 0.5 = \underline{455.4 \text{ ft}^3}$$

$$4 \frac{1}{2}'' \text{ casing set @ } 9006' \text{ in } 7 \frac{7}{8}'' \text{ hole, Fill up} = 4.3899 \text{ ft/ft}^3$$

$$(455.4 \text{ ft}^3) \times (4.3899 \text{ ft}) = 1999' \text{ of fill up}$$

$$\text{Top of Cement} = (9006') - (1999') = \underline{7007'}$$

Calculated Top of Cement using actual Slurry Yields:

$$\text{Slurry: } 490 \text{ sx } 50/50 \text{ poz w/ } 18\% \text{ gel, Yield: } 2.74 \text{ ft}^3/\text{sx}$$

$$200 \text{ sx Class "C" with } 4\% \text{ gel, Yield: } 1.72 \text{ ft}^3/\text{sx}$$

$$\text{Slurry Volume} = (490 \text{ sx}) \times (2.74 \text{ ft}^3/\text{sx}) + (200 \text{ sx}) \times (1.72 \text{ ft}^3/\text{sx}) = 1687 \text{ ft}^3$$

$$\text{Assume 50 \% excess cement, } (1687 \text{ ft}^3) \times 0.5 = \underline{843 \text{ ft}^3}$$

$$4 \frac{1}{2}'' \text{ casing set @ } 9006' \text{ in } 7 \frac{7}{8}'' \text{ hole, Fill up} = 4.3899 \text{ ft/ft}^3$$

$$(843 \text{ ft}^3) \times (4.3899 \text{ ft}) = 3702' \text{ of fill up}$$

$$\text{Top of Cement} = (9006') - (3702') = \underline{5304'}$$



HALLIBURTON SERVICES

KEITH MABERRY
PHILLIPS PETROLEUM
VAC ABO UNIT

8/09/93

The following are fluid properties and compressive strengths of three slurries as requested:

Slurry #1: 50/50 Pozmix "A" Class "H" + 18% gel

Slurry weight	11.43 lb/gal
Slurry yield	2.74 cf/sk
Water required	16.18 gal/sk

Compressive strengths tested at 140 F BHCT:

24 hr	175 psi
48 hr	420 psi
72 hr	570 psi
7 day	680 psi

Slurry #2: Class "C" + 4% gel

Slurry weight	13.50 lb/gal
Slurry yield	1.72 cf/sk
Water required	9.06 gal/sk

Compressive strengths from Halliburton Cement Tables:

	<u>110 F</u>
12 hr	935 psi
24 hr	1665 psi
72 hr	2955 psi

Slurry #3: Class "C" + 40% Diacel D + 1/4 cfps Strata-Crete 6

Slurry weight	10.86 lb/gal
Slurry yield	4.75 cf/sk
*Water required	29.20 gal/sk

*Using 5.35 gal/10% Diacel D

Compressive strengths unavailable.

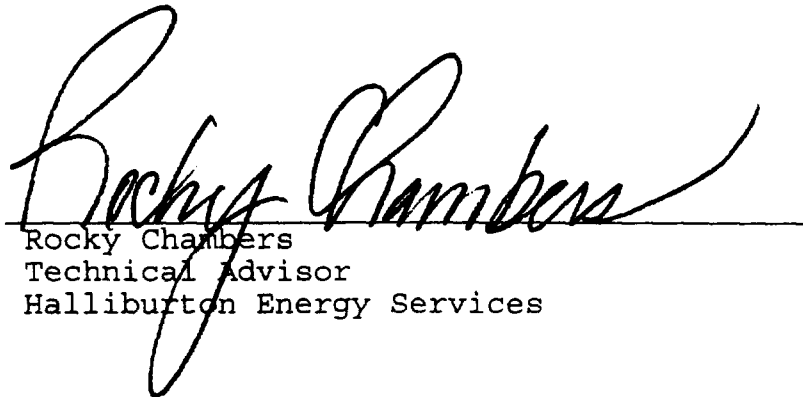


NOTE: The following Strata-Crete 6 properties were used in the above calculation of fluid properties and were obtained from the 1967 edition of the Halliburton Cementing Tables:

Bulk volume	43 lb/cf
Absolute volume	3.85 gal/cf @ 0 psi
Absolute volume	2.24 gal/cf @ 3000 psi
Water required	6.0 gal/sk

It should be noted that all fluid properties shown above may vary depending on water volume added to the slurries.

Prepared by:


Rocky Chambers
Technical Advisor
Halliburton Energy Services