# CORE LABORATORIES, INC.

*Petroleum Reservoir Engineering*

## DALLAS, TEXAS

## CORE SUMMARY AND CALCULATED RECOVERABLE OIL

**FORMATION NAME AND DEPTH INTERVAL:** Pennsylvanian 7610.0-7635.0

| | | | | |
|---|---|---|---|---|
| FEET OF CORE RECOVERED FROM ABOVE INTERVAL | | 25.0 | AVERAGE TOTAL WATER SATURATION: PER CENT OF PORE SPACE | 48.7 |
| FEET OF CORE INCLUDED IN AVERAGES | | 14.4 | AVERAGE CONNATE WATER SATURATION: PER CENT OF PORE SPACE  (c) | 48.7 |
| AVERAGE PERMEABILITY: MILLIDARCYS | Max. | 0.6 | OIL GRAVITY: °API | |
| | 90° | 0.3 | | |
| PRODUCTIVE CAPACITY: MILLIDARCY-FEET | Max. | 8.6 | ORIGINAL SOLUTION GAS-OIL RATIO: CUBIC FEET PER BARREL | |
| | 90° | 4.3 | | |
| AVERAGE POROSITY: PER CENT | | 5.0 | ORIGINAL FORMATION VOLUME FACTOR: BARRELS SATURATED OIL PER BARREL STOCK-TANK OIL | |
| AVERAGE RESIDUAL OIL SATURATION: PER CENT OF PORE SPACE | | 1.4 | CALCULATED ORIGINAL STOCK-TANK OIL IN PLACE: BARRELS PER ACRE-FOOT | |

Calculated maximum solution gas drive recovery is ___ barrels per acre-foot, assuming production could be continued until reservoir pressure declined to zero psig. Calculated maximum water drive recovery is ___ barrels per acre-foot, assuming full maintenance of original reservoir pressure, 100% areal and vertical coverage, and continuation of production to 100% water cut. (*Please refer to footnotes for further discussion of recovery estimates.*)

**FORMATION NAME AND DEPTH INTERVAL:** Pennsylvanian 9200.0-9204.5

| | | | | |
|---|---|---|---|---|
| FEET OF CORE RECOVERED FROM ABOVE INTERVAL | | 4.5 | AVERAGE TOTAL WATER SATURATION: PER CENT OF PORE SPACE | 19.3 |
| FEET OF CORE INCLUDED IN AVERAGES | | 4.5 | AVERAGE CONNATE WATER SATURATION: PER CENT OF PORE SPACE  (c) | 19.3 |
| AVERAGE PERMEABILITY: MILLIDARCYS | Max. | 2.5 | OIL GRAVITY: °API | |
| | 90° | 2.2 | | |
| PRODUCTIVE CAPACITY: MILLIDARCY-FEET | Max. | 11 | ORIGINAL SOLUTION GAS-OIL RATIO: CUBIC FEET PER BARREL | |
| | 90° | 9.9 | | |
| AVERAGE POROSITY: PER CENT | | 6.6 | ORIGINAL FORMATION VOLUME FACTOR: BARRELS SATURATED OIL PER BARREL STOCK-TANK OIL | |
| AVERAGE RESIDUAL OIL SATURATION: PER CENT OF PORE SPACE | | 2.2 | CALCULATED ORIGINAL STOCK-TANK OIL IN PLACE: BARRELS PER ACRE-FOOT | |

Calculated maximum solution gas drive recovery is ___ barrels per acre-foot, assuming production could be continued until reservoir pressure declined to zero psig. Calculated maximum water drive recovery is ___ barrels per acre-foot, assuming full maintenance of original reservoir pressure, 100% areal and vertical coverage, and continuation of production to 100% water cut. (*Please refer to footnotes for further discussion of recovery estimates.*)

(c) Calculated     (e) Estimated     (m) Measured     (*) Refer to attached letter.

*These recovery estimates represent theoretical maximum values for solution gas and water drive. They assume that production is started at original reservoir pressure; i.e., no account is taken of production to date or of prior drainage to other areas. The effects of factors tending to reduce actual ultimate recovery, such as economic limits on oil production rates, gas-oil ratios, or water-oil ratios, have not been taken into account. Neither have factors been considered which may result in actual recovery intermediate between solution gas and complete water drive recoveries, such as gas cap expansion, gravity drainage, or partial water drive. Detailed predictions of ultimate oil recovery to specific abandonment conditions may be made in an engineering study in which consideration is given to overall reservoir characteristics and economic factors.*

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**CORE LABORATORIES, INC.**
*Petroleum Reservoir Engineering*
**DALLAS, TEXAS**

January 4, 1963

Mr. Ralph Lowe
Box 832
Midland, Texas

Subject: Core Analysis
Indian Basin No. 1-A Well
Eddy County, New Mexico
Location: Sec. 22-T21S-R23E

Dear Sir:

Canyon formation analyzed between 7374.0 and 7660.4 feet is inter-
preted to be gas productive where permeable. The productive capacity
is considered adequate for satisfactory production rates without for-
mation treatment. Average core analysis values are presented on
page one of this report.

From 7660.4 to 7675.6 feet, Canyon formation exhibits high total
water saturations and is interpreted to be both water and gas produc-
tive.

Strawn sand analyzed from 8667 to 8678 feet is considered to be gas
productive where permeable; however, due to low permeability, a
completion attempt is not recommended. Average core analysis val-
ues also are presented for the interval on page one.

Permeable Morrow formation analyzed at intervals between 9132.0
and 9324.7 feet is interpreted to be gas productive with adequate
productive capacity for satisfactory rates of production without for-
mation treatment. A summary of average core analysis values is
presented on page two.

Due to lower residual oil and high total water saturations, the inter-
val from 9324.7 to 9360.0 feet is interpreted to be water productive
where permeable.

We appreciate this opportunity to be of service.

Very truly yours,

Core Laboratories, Inc.

R. S. Bynum, Jr.,
Division Manager

RSB:JR:dc

# CORE LABORATORIES, INC.
*Petroleum Reservoir Engineering*
### DALLAS, TEXAS

## CORE SUMMARY AND CALCULATED RECOVERABLE OIL

**FORMATION NAME AND DEPTH INTERVAL:** Canyon 7374.0-7660.4

| | | | |
|---|---|---|---|
| FEET OF CORE RECOVERED FROM ABOVE INTERVAL | 273.9 | AVERAGE TOTAL WATER SATURATION: PER CENT OF PORE SPACE | 35.4 |
| FEET OF CORE INCLUDED IN AVERAGES | 181.4 | AVERAGE CONNATE WATER SATURATION: PER CENT OF PORE SPACE (c) | 35.4 |
| AVERAGE PERMEABILITY: MILLIDARCYS    Max.    90° | 44    13 | OIL GRAVITY: °API | |
| PRODUCTIVE CAPACITY: MILLIDARCY-FEET    Max.    90° | 7982    2358 | ORIGINAL SOLUTION GAS-OIL RATIO: CUBIC FEET PER BARREL | |
| AVERAGE POROSITY: PER CENT | 3.7 | ORIGINAL FORMATION VOLUME FACTOR: BARRELS SATURATED OIL PER BARREL STOCK-TANK OIL | |
| AVERAGE RESIDUAL OIL SATURATION: PER CENT OF PORE SPACE | 4.8 | CALCULATED ORIGINAL STOCK-TANK OIL IN PLACE: BARRELS PER ACRE-FOOT | |

Calculated maximum solution gas drive recovery is      barrels per acre-foot, assuming production could be continued until reservoir pressure declined to zero psig. Calculated maximum water drive recovery is barrels per acre-foot, assuming full maintenance of original reservoir pressure, 100% areal and vertical coverage, and continuation of production to 100% water cut. (*Please refer to footnotes for further discussion of recovery estimates.*)

**FORMATION NAME AND DEPTH INTERVAL:** Strawn 8667.0-8678.0

| | | | |
|---|---|---|---|
| FEET OF CORE RECOVERED FROM ABOVE INTERVAL | 11.0 | AVERAGE TOTAL WATER SATURATION: PER CENT OF PORE SPACE | 54.4 |
| FEET OF CORE INCLUDED IN AVERAGES | 6.2 | AVERAGE CONNATE WATER SATURATION: PER CENT OF PORE SPACE (c) | 54.4 |
| AVERAGE PERMEABILITY: MILLIDARCYS    Max.    90° | 0.2    0.2 | OIL GRAVITY: °API | |
| PRODUCTIVE CAPACITY: MILLIDARCY-FEET    Max.    90° | 1.2    1.2 | ORIGINAL SOLUTION GAS-OIL RATIO: CUBIC FEET PER BARREL | |
| AVERAGE POROSITY: PER CENT | 8.5 | ORIGINAL FORMATION VOLUME FACTOR: BARRELS SATURATED OIL PER BARREL STOCK-TANK OIL | |
| AVERAGE RESIDUAL OIL SATURATION: PER CENT OF PORE SPACE | 2.2 | CALCULATED ORIGINAL STOCK-TANK OIL IN PLACE: BARRELS PER ACRE-FOOT | |

Calculated maximum solution gas drive recovery is      barrels per acre-foot, assuming production could be continued until reservoir pressure declined to zero psig. Calculated maximum water drive recovery is barrels per acre-foot, assuming full maintenance of original reservoir pressure, 100% areal and vertical coverage, and continuation of production to 100% water cut. (*Please refer to footnotes for further discussion of recovery estimates.*)

(c) Calculated    (e) Estimated    (m) Measured    (*) Refer to attached letter.

*These recovery estimates represent theoretical maximum values for solution gas and water drive. They assume that production is started at original reservoir pressure; i.e., no account is taken of production to date or of prior drainage to other areas. The effects of factors tending to reduce actual ultimate recovery, such as economic limits on oil production rates, gas-oil ratios, or water-oil ratios, have not been taken into account. Neither have factors been considered which may result in actual recovery intermediate between solution gas and complete water drive recoveries, such as gas cap expansion, gravity drainage, or partial water drive. Detailed predictions of ultimate oil recovery to specific abandonment conditions may be made in an engineering study in which consideration is given to overall reservoir characteristics and economic factors.*

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*Petroleum Reservoir Engineering*

DALLAS, TEXAS

## CORE SUMMARY AND CALCULATED RECOVERABLE OIL

**FORMATION NAME AND DEPTH INTERVAL:**  Morrow  9132.0-9324.7

| | | | | | |
|---|---|---|---|---|---|
| FEET OF CORE RECOVERED FROM ABOVE INTERVAL | | 187.9 | AVERAGE TOTAL WATER SATURATION: PER CENT OF PORE SPACE | | 48.5 |
| FEET OF CORE INCLUDED IN AVERAGES | | 18.0 | AVERAGE CONNATE WATER SATURATION: PER CENT OF PORE SPACE | (c) | 48.5 |
| AVERAGE PERMEABILITY: MILLIDARCYS | Max. 90° | 12 / 11 | OIL GRAVITY: °API | | |
| PRODUCTIVE CAPACITY: MILLIDARCY-FEET | Max. 90° | 216 / 198 | ORIGINAL SOLUTION GAS-OIL RATIO: CUBIC FEET PER BARREL | | |
| AVERAGE POROSITY: PER CENT | | 10.8 | ORIGINAL FORMATION VOLUME FACTOR: BARRELS SATURATED OIL PER BARREL STOCK-TANK OIL | | |
| AVERAGE RESIDUAL OIL SATURATION: PER CENT OF PORE SPACE | | 3.9 | CALCULATED ORIGINAL STOCK-TANK OIL IN PLACE: BARRELS PER ACRE-FOOT | | |

Calculated maximum solution gas drive recovery is     barrels per acre-foot, assuming production could be continued until reservoir pressure declined to zero psig. Calculated maximum water drive recovery is barrels per acre-foot, assuming full maintenance of original reservoir pressure, 100% areal and vertical coverage, and continuation of production to 100% water cut. (*Please refer to footnotes for further discussion of recovery estimates.*)

**FORMATION NAME AND DEPTH INTERVAL:**

| | | | | | |
|---|---|---|---|---|---|
| FEET OF CORE RECOVERED FROM ABOVE INTERVAL | | | AVERAGE TOTAL WATER SATURATION: PER CENT OF PORE SPACE | | |
| FEET OF CORE INCLUDED IN AVERAGES | | | AVERAGE CONNATE WATER SATURATION: PER CENT OF PORE SPACE | | |
| AVERAGE PERMEABILITY: MILLIDARCYS | | | OIL GRAVITY: °API | | |
| PRODUCTIVE CAPACITY: MILLIDARCY-FEET | | | ORIGINAL SOLUTION GAS-OIL RATIO: CUBIC FEET PER BARREL | | |
| AVERAGE POROSITY: PER CENT | | | ORIGINAL FORMATION VOLUME FACTOR: BARRELS SATURATED OIL PER BARREL STOCK-TANK OIL | | |
| AVERAGE RESIDUAL OIL SATURATION: PER CENT OF PORE SPACE | | | CALCULATED ORIGINAL STOCK-TANK OIL IN PLACE: BARRELS PER ACRE-FOOT | | |

Calculated maximum solution gas drive recovery is     barrels per acre-foot, assuming production could be continued until reservoir pressure declined to zero psig. Calculated maximum water drive recovery is barrels per acre-foot, assuming full maintenance of original reservoir pressure, 100% areal and vertical coverage, and continuation of production to 100% water cut. (*Please refer to footnotes for further discussion of recovery estimates.*)

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