

OLEUM OPERATING COMPANY, L.C.

Thompson Bluff Field

JEFFERSON DAVIS PARISH, LOUISIANA

Docket No. 18-623
Hackberry Sand, Reservoir A

December 4, 2018

Geological Witness: Bryan S. Groves

Engineering Witness: Jim Veazey

prepared by

BRYAN GROVES

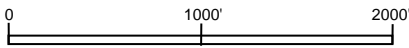
OIL & GAS GEOLOGIST

UNITIZATION / 3-D INTERPRETATION

www.bryangrovesgeology.com

OLEUM OPERATING COMPANY, L.C.

THOMPSON BLUFF FIELD
JEFFERSON DAVIS PARISH, LOUISIANA
ORIGINAL CAIRN
LOCATION PERMIT PLAT



BRYAN GROVES
OIL & GAS GEOLOGIST
www.bryangrovesgeology.com

The Texas Co.

23

Chas R.
Houssiere Est.

PROPOSED LOCATION

Gr. Elev. = 11'

NAD 1983

Lat. = 30° 24' 56.92"

Long. = 93° 03' 36.39"

NAD 1927 (South Zone)

X = 1,455,756.37'

Y = 640,103.10'

Quatre
Mineral, LLC

Kenneth R. Parker, et al

Stroud Production

VUA

Earline Evans
Angelle Trust, et al

S.W. Richardson

From NGS Mon.

20,444.86'

569°32'09"W

NGS Mon.
"INDIAN"

Houssiere
Interest, LLC

26

Chevron
U.S.A. Inc.

Oleum Operating

Cairn Energy Partners, LLC

Wolf & Magee

Quatre Mineral, LLC

Kenneth R. Parker, et al

Conoco

Lakeside Resources

Singer-Felishaker

Pickens

Chevron U.S.A. Inc.

NAD 1983 (South Zone)

T

M.P.
Erwin Est.

27

7

S

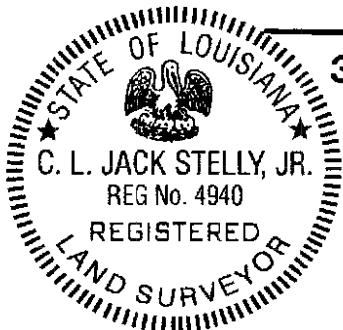
34

J. A.
Bel, et al

Quatre
Mineral, LLC

35

The Texas Co.



I, C. L. Jack Stelly, Jr., hereby certify that the Loc'n of Cairn Energy Partners, LLC's VUA; Quatre Mineral, LLC No. 1 is as follows: S69°32'09"W 20,444.86' from NGS Mon. "INDIAN", falling in Section 26, T 7 S - R 7 W Jefferson Davis Parish, Louisiana.

C. L. Jack Stelly, Jr.

C. L. JACK STELLY, JR., P.L.S.
REGISTERED LAND SURVEYOR NO. 4940
STATE OF LOUISIANA
C. L. JACK STELLY & ASSOCIATES, INC.
143 WALL STREET, LAFAYETTE, LA 70506
PH. (337) 237-0746
FILE NO. 20250-L1.DWG

NOTE:

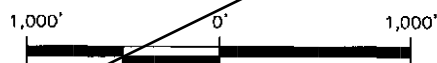
No Commercial or Residential Structures not owned by the Applicant, his Lessor, or other Predecessor in interest are located within 500' of the Proposed Location.

LOUISIANA OFFICE OF CONSERVATION

CAIRN ENERGY PARTNERS, LLC

VUA; Quatre Mineral, LLC No. 1

JEFFERSON DAVIS PARISH, LOUISIANA



SCALE: 1" = 1,000'

JULY 28, 2017

Chapter 1. General Provisions

§135. Directional Drilling and Well Surveys

make application for an amended location showing by attached plat the amended projected bottom-hole objective and secure an amended permit to drill before commencing such operations. The amended bottom-hole location or objective shall comply with all minimum distances from lease or property lines as prescribed by all statewide orders or any other applicable field orders.

2. In the event a well is to be drilled at a distance from a property line where such distance is less than the apparent resultant lateral deviation, as determined by multiplying the proposed total depth of the well by the factor 0.087156, a permit to drill for minerals will be issued with the understanding that the operator will be required to furnish the appropriate district manager with inclination and/or directional survey data as proof that the well will be completed in compliance with the provisions of this Statewide Order No. 29-B before an allowance is assigned to said well.

B. An inclination survey shall be made on all wells drilled in the state of Louisiana with the first shot point at a depth not greater than that of the surface casing seat and succeeding shot points not more than 1,000 feet apart. Inclination surveys conforming to these requirements may be made either during the normal course of drilling or after the well has reached total depth. Such survey data shall be certified by the operator's representative and/or drilling contractor and shall indicate the resultant lateral deviation as the sum of the calculated lateral displacement determined between each inclination survey point assuming that all such displacement occurs in the direction of the nearest property line. If a directional survey determining the bottom of the hole is filed with the Commissioner of Conservation upon completion of the well, it shall not be necessary to furnish the inclination survey data.

1. Except as otherwise specified herein, all inclination and/or directional survey data shall be filed along with Form WH (Well History).

C. A directional survey shall be run and three certified copies thereof filed by or at the direction of the operator with the appropriate district manager of the Department of Conservation on all future wells drilled in the state of Louisiana where:

- 1. the well is directionally controlled and is thereby intentionally deflected from the vertical; or
2. the surface location is less than 330 feet from the nearest property line, and the well is drilled below a depth of 3,786 feet; or
3. the resultant lateral deviation as calculated from inclination survey data is a distance greater than the distance from the center of the surface location of the wellbore to the nearest property line; or
4. the wellbore deviates laterally a resultant distance greater than that determined by a 5-degree angle from a vertical line passing through the center of the surface location of the wellbore.

Property Line, as used herein, shall mean the boundary dividing tracts on which mineral rights, royalty rights or leases

are separately owned except that where a unit as defined in Section 9, Paragraph B, of Revised Statutes of 1950, has been created, the boundaries of the unit shall be considered the property line.

D. The Commissioner of Conservation, on his own initiative or at the request of an offset operator, shall have the right to require the operator to run a directional survey on any well if there is reasonable cause therefor. Whenever a survey is so required by the commissioner at the request of an offset operator and the operator of the well and the offset operator are unable to agree as to the terms and conditions for running such survey, the commissioner, upon request of either, shall determine such terms and conditions, after notice to all interested parties and a public hearing.

E. Unless required by the Commissioner of Conservation under §135.D hereof, a directional survey shall not be required for any well which is not directionally controlled and thereby intentionally deflected from the vertical and which has a surface location, maximum angle of deviation, and total depth, all in compliance with the provisions hereof.

F. The Commissioner of Conservation may assess appropriate penalties for failure to comply with any of the provisions hereof.

G. The provisions hereof shall not alter or affect the minimum spacing provisions of Statewide Orders 29-E and 29-H or any other applicable orders.

AUTHORITY NOTE: Promulgated in accordance with R.S. 30:4 et seq.
HISTORICAL NOTE: Adopted by the Department of Conservation (August 1943), amended (March 1967).

§137. Plugging and Abandonment

A. Schedule of Abandonment

1. Dry Holes. All wells drilled for oil or gas and found to be dry prior to or after the effective date of this order shall be plugged within 90 days after operations have been completed thereon or 90 days after the effective date of this order, whichever is later, unless an extension of time is granted by the commissioner of conservation.

2. Inactive, Future Utility Wells. All inactive wells classified as having future utility shall be plugged within five years of the date of the well becoming inactive. Failure to accurately report wells on the inactive well report shall be subject to the provisions of R.S. 30:17.

a. For wells that have been inactive for a period of four years or more on the effective date of this rule, the well shall be plugged w

b. If an c well in accordanc utility, an annual a be assessed until th

c. For all financial security e be provided withi Rule.

EXHIBIT NO. 2A
DOCKET NO. 18-623 DATE: 12-4-18

OLEUM OPERATING COMPANY, L.C.

THOMPSON BLUFF FIELD
JEFFERSON DAVIS PARISH, LOUISIANA

Title 43, Part XIX

Chapter 19. Oil and Gas Well Spacing

§1901. Scope

A. This order establishes rules and regulations for spacing of wells drilled in search of oil and gas in areas of Louisiana for which no spacing regulations have been prescribed by Special Orders.

AUTHORITY NOTE: Promulgated in accordance with R.S. 30:4 et seq.

HISTORICAL NOTE: Adopted by the Department of Conservation, August 1, 1957, amended September 1, 1957.

§1903. Definitions

A. Property Line—as used herein shall mean the boundary dividing tracts on which mineral rights, royalty, or leases are separately owned, except that where conventional units shall have been created for the drilling of the well, the boundaries of the unit shall be considered the property line.

AUTHORITY NOTE: Promulgated in accordance with R.S. 30:4 et seq.

HISTORICAL NOTE: Adopted by the Department of Conservation, August 1, 1957, amended September 1, 1957.

§1905. Order

A. IT IS ORDERED THAT no permits shall be issued for the drilling of wells in search of oil or gas and no well shall be drilled in search of oil or gas nor shall a well be abandoned in one pool and recompleted in another pool in a field in Louisiana in which no spacing rule are prescribed by special orders, unless the location of such well shall comply with the following requirements.

1. No spacing shall be required for wells drilled in search of oil to depths less than 3,000 feet subsea, except as provided for in the last Paragraph of this order.

2. Wells drilled in search of oil to depths below 3,000 feet subsea shall not be located closer than 330 feet from any property line nor closer than 900 feet from any other well completed in, drilling to, or for which a permit shall have been granted to drill to, the same pool.

3. Wells drilled in search of gas shall not be located closer than 330 feet to any property line nor closer than 2,000 feet to any other well completed in, drilling to, or for which a permit shall have been granted to drill to, the same pool.

4. When an order has been issued creating a pattern of drilling or developmental units for a pool, if application is made for a permit to drill a well outside of the unit pattern

which might develop an extension of the pool, the commissioner may require that such well be located and drilled in compliance with the provisions of orders affecting that pool.

5. All applications for permits to drill in search of oil or gas shall contain with such application a commercial ownership map containing such information that is in the possession of the applicant showing:

a. the location of existing producing or drilling wells;

b. the lease and property ownership of tracts offsetting or in the vicinity of the well for which the permit is sought; and

c. the location of the proposed well with respect to property and lease lines, as provided for in Part XIX, Subpart 1.

AUTHORITY NOTE: Promulgated in accordance with R.S. 30:4 et seq.

HISTORICAL NOTE: Adopted by the Department of Conservation, August 1, 1957, amended September 1, 1957.

§1907. Exceptions

A. Exceptions to the above shall be granted when conforming to the following requirements.

1. Where prior to the issuance of this order, a pool has already been partially developed with a greater density of wells than that prescribed herein, the Commissioner of Conservation may, without additional public hearing, exempt such pools from the provisions of this order. The exemptions for these pools shall be granted only after application has been made to the Commissioner of Conservation in writing accompanied by a map delineating the location of all existing wells completed and producing from the pool for which exception is being asked.

2. Where prior to the issuance of this order a well has previously been completed at a location offsetting the property or unit line closer to the property or unit line than the setback prescribed herein, the commissioner may, without additional public hearing permit like exception for this offsetting well, such exception to be limited to the pool from which the offsetting well is producing.

3. The c hearing exempt he considers to other complex! commissioner, These requests to the Comm sufficient evide

EXHIBIT NO. 2B
DOCKET NO. 18-623 DATE: 12-4-18

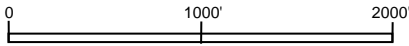
OLEUM OPERATING COMPANY, L.C.

THOMPSON BLUFF FIELD
JEFFERSON DAVIS PARISH, LOUISIANA

Title 43, Part XIX

OLEUM OPERATING COMPANY, L.C.

THOMPSON BLUFF FIELD
JEFFERSON DAVIS PARISH, LOUISIANA
29-B & 29-E OVERSIGHT



BRYAN GROVES
OIL & GAS GEOLOGIST
www.bryangrovesgeology.com

The Texas Co.

23

Chas R. Houssiere Est.

PROPOSED LOCATION

Gr. Elev. = 11'

NAD 1983

Lat. = 30° 24' 56.92"

Long. = 93° 03' 36.39"

NAD 1927 (South Zone)

X = 1,455,756.37'

Y = 640,103.10'

Quatre Mineral, LLC

Kenneth R. Parker, et al

Stroud Production

VUA

Earline Evans Angelle Trust, et al

S.W. Richardson

From NGS Mon. "INDIAN"

NGS Mon. "INDIAN"

Houssiere Interest, LLC

Chevron U.S.A. Inc.

Oleum Operating

Cairn Energy Partners, LLC

Wolf & Magee

Quatre Mineral, LLC

Kenneth R. Parker, et al

Conoco

Lakeside Resources

Singer-Felishaker

Pickens

Chevron U.S.A. Inc.

HBV RA SUA
APO 505-A
Eff. 2-20-01

NAD 1983 (South Zone)

T
M.P. Erwin Est.

27

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7

S

34

J. A. Bel, et al

Quatre Mineral, LLC

35

The Texas Co.



I, C. L. Jack Stelly, Jr., hereby certify that the Loc'n of Cairn Energy Partners, LLC's VUA; Quatre Mineral, LLC No. 1 is as follows: S69°32'09"W 20,444.86' from NGS Mon. "INDIAN", falling in Section 26, T 7 S - R 7 W Jefferson Davis Parish, Louisiana.

C. L. Jack Stelly, Jr.

C. L. JACK STELLY, JR., P.L.S.
REGISTERED LAND SURVEYOR NO. 4940
STATE OF LOUISIANA
C. L. JACK STELLY & ASSOCIATES, INC.
143 WALL STREET, LAFAYETTE, LA 70506
PH. (337) 237-0746
FILE NO. 20250-L1.DWG

NOTE:

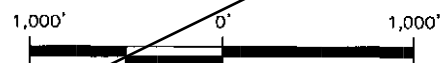
No Commercial or Residential Structures not owned by the Applicant, his Lessor, or other Predecessor in interest are located within 500' of the Proposed Location.

LOUISIANA OFFICE OF CONSERVATION

CAIRN ENERGY PARTNERS, LLC

VUA; Quatre Mineral, LLC No. 1

JEFFERSON DAVIS PARISH, LOUISIANA



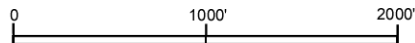
SCALE: 1" = 1,000'

JULY 28, 2017

OLEUM OPERATING COMPANY, L.C.

THOMPSON BLUFF FIELD
JEFFERSON DAVIS PARISH, LOUISIANA

SURVEYOR FINDINGS



BRYAN GROVES
OIL & GAS GEOLOGIST
www.bryangrovesgeology.com

POINT OF BEGINNING
(Westernmost Corner)

HBY RA SUA; ORDER NO. 505-A

NAD 1983 [2011], South Zone

Northing = 700,835.92'

Easting = 2,736,673.41'

Lat. = N 30° 24' 57.1550"

Long. = W 93° 03' 35.0229"

NAD 1927, South Zone

Northing = 640,124.31'

Easting = 1,455,876.77'

Lat. = N 30° 24' 56.4441"

Long. = W 93° 03' 34.4645"

HBY RA SUA
Order No. 505-A

AS-DRILLED SURFACE LOCATION

CAIRN ENERGY PARTNERS, LLC

VUA; Quatre Mineral, LLC No. 1 (S/N 251076)

NAD 1983 [2011], South Zone

Northing = 700,815.71'

Easting = 2,736,552.16'

Lat. = N 30° 24' 56.9369"

Long. = W 93° 03' 36.4039"

NAD 1927, South Zone

Northing = 640,104.1'

Easting = 1,455,755.5'

Lat. = N 30° 24' 56.226"

Long. = W 93° 03' 35.845"

Stroud
Prod. 1

T
7
S

27
34

S80° 32' 20"W 122.9'

Portion of proposed
NS RB SUA
Quatre Mineral, LLC No. 1

Continental 3

Lakeside
Resources 1

RPS Energy
Inc. 2

Singer
Fleischaker 1

SW Richardson

N55° 14' 00"E

2391.5'
112.8' from A.D. BHL

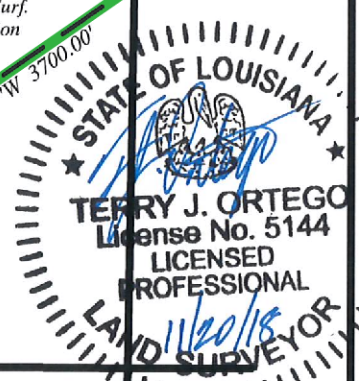
A.D. BHL
@ 8,252' M.D.

The Pickens Co. 1

Point of Beginning for
Proposed NS RB SUA
Quatre Mineral, LLC No. 1
NAD 1927, South Zone
Northing = 641,173.81'
Easting = 1,458,043.07'
***See Note #3

(S/N 224491)
Oleum
Oper. 36-1

A.D. Surf.
Location



Notes:

1. This is a client defined as-drilled survey.
2. Bearings and distances are based on NAD 1983 (2011), Louisiana South Zone.
3. All information for the proposed NS RB SUA Quatre Mineral, LLC No. 1 unit is taken from exhibit prepared by Leon E. Comeaux & Associates attached to transmittal letter dated October 10, 2018 from Randazzo Giglio & Bailey LLC to Office of Conservation.

Reference Document:

- 1) Sub-Surface Directional Survey Report prepared by Rusty Clark Survey Company, Inc. from Well S/N 224491 historic well file.

I, Terry J. Ortego, hereby certify that the as-drilled surface location of Cairn Energy Partners, LLC's, VUA; Quatre Mineral, LLC No. 1 is as follows:
S80° 32' 20"W 122.9' from the westernmost corner of HBY RA SUA, Order No. 505-A unit falling in Section 26, T. 7 S., R. 7 W., Jefferson Davis Parish, Louisiana.

Terry J. Ortego
REGISTERED LAND SURVEYOR NO. 5144
STATE OF LOUISIANA

TERRY J. ORTEGO
M.P. MAYEUX SURVEYING & BOUNDARY CONSULTING, LLC
P.O. BOX 61501, LAFAYETTE, LA 70596
337-266-9500

L-1 C3D T7SR7WS26 Oleum Operating.dwg

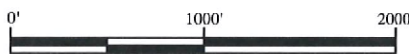
AS-DRILLED SURVEY

PREPARED FOR

OLEUM OPERATING COMPANY, L.C.

THOMPSON BLUFF FIELD

JEFFERSON DAVIS PARISH, LOUISIANA



SCALE: 1" = 1000'

NOVEMBER 20, 2018

R 7 W

T
7
S

22
 HBV RB SUB
 APO 957-E-4
 ± 160 Acs.
 NS RD SUB
 APO 957-C-5
 (Terminated 2-1-16)
 Topsy Field

HBV RB SUA
 APO 957-E-1
 ± 160 Acs.
 NS RD SUA
 APO 957-C-3
 (Terminated 2-1-16)
 Topsy Field

27
 HBV RA SUA
 APO 957-E
 NS RC SUA
 APO 957-C-2
 ± 160 Acs.
 Topsy Field

CAIRN
 PROPOSED
 NS RB SUA
 ± 220 ACRES

TOPSY FIELD

NOD SU
 APO 505
 Docket 60-174
 210.620 Acs.
 (Terminated 5-15-78)

23
 HBV RB SUC
 APO 957-E-5
 ± 250 Acs
 NS RD SUC
 APO 957-C-6
 (Terminated 2-1-16)
 Topsy Field

HBV RB SUB
 APO 505-A-1
 NS RA SUB
 APO 505-B
 ± 160 Acs.
 (Terminated 3-21-11)

HBV RB SUA
 APO 505-A-1
 NS RA SUA
 APO 505-B
 ± 160 Acs.
 (Terminated 3-21-11)

26
 HBV RA SUA
 APO 505-A
 ± 170 Acs.

Northern Fault
 350'/7950'
 Dkt. 60-174

Southern Fault
 300'/8250'
 Dkt. 60-174

OLEUM OPER.
 HBV RA SUB
 Quatre Min. No. 1
 ± 108 ACRES

35
 THOMPSON BLUFF FIELD

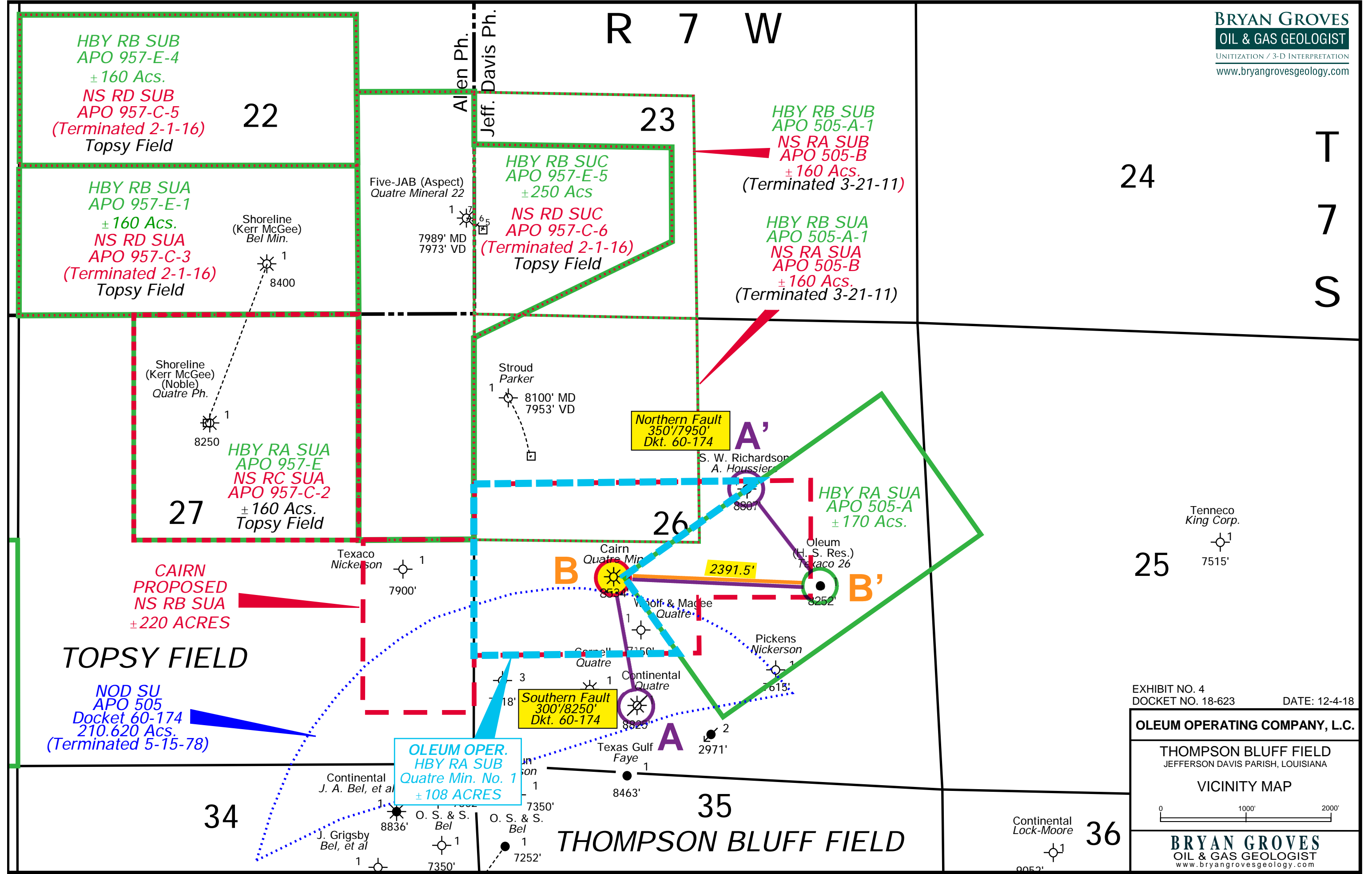


EXHIBIT NO. 4
 DOCKET NO. 18-623
 DATE: 12-4-18

OLEUM OPERATING COMPANY, L.C.
 THOMPSON BLUFF FIELD
 JEFFERSON DAVIS PARISH, LOUISIANA
 VICINITY MAP
 0 1000' 2000'
BRYAN GROVES
 OIL & GAS GEOLOGIST
 www.bryangrovesgeology.com

SOUTH
A

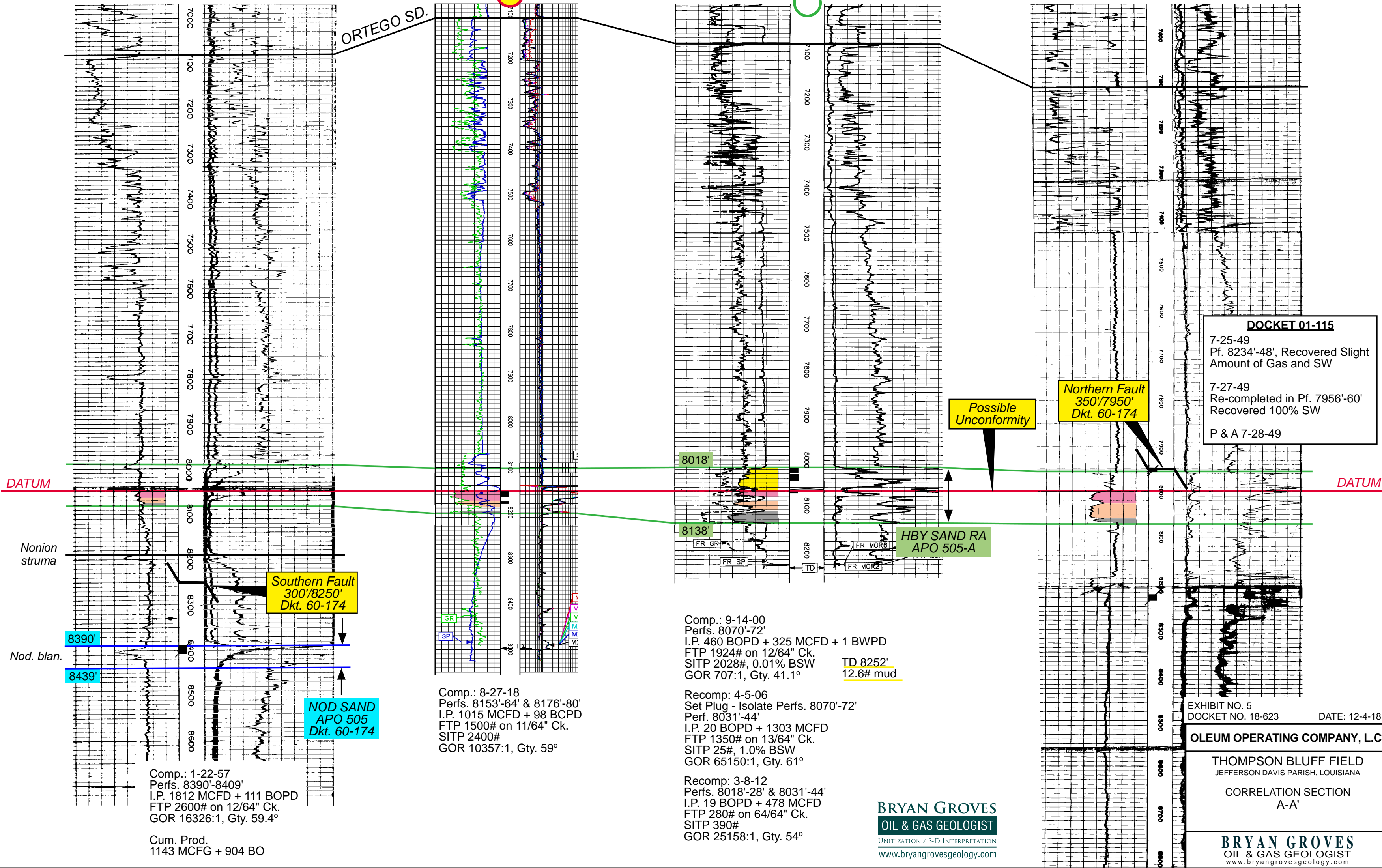
CONTINENTAL
QUATRE MIN. NO. 1
Sec. 26, T 7 S - R 7 W
SN: 63183

CAIRN ENERGY
QUATRE MIN. NO. 1
Sec. 26, T 7 S - R 7 W
SN: 251076

OLEUM OPERATING
(HS RES., INC.)
TEXACO 26 NO. 1
Sec. 26, T 7 S - R 7 W
SN: 224491

S. W. RICHARDSON
HOUSIERE NO. 1
Sec. 26, T 7 S - R 7 W
SN: 38271

NORTH
A'



DATUM

DATUM

Southern Fault
300'/8250'
Dkt. 60-174

Northern Fault
350'/7950'
Dkt. 60-174

Possible
Unconformity

HBV SAND RA
APO 505-A

NOD SAND
APO 505
Dkt. 60-174

DOCKET 01-115

7-25-49
Pf. 8234'-48', Recovered Slight
Amount of Gas and SW

7-27-49
Re-completed in Pf. 7956'-60'
Recovered 100% SW

P & A 7-28-49

Comp.: 9-14-00
Perfs. 8070'-72'
I.P. 460 BOPD + 325 MCFD + 1 BWPD
FTP 1924# on 12/64" Ck.
SITP 2028#, 0.01% BSW TD 8252'
GOR 707:1, Gty. 41.1° 12.6# mud

Recomp: 4-5-06
Set Plug - Isolate Perfs. 8070'-72'
Perf. 8031'-44'
I.P. 20 BOPD + 1303 MCFD
FTP 1350# on 13/64" Ck.
SITP 25#, 1.0% BSW
GOR 65150:1, Gty. 61°

Recomp: 3-8-12
Perfs. 8018'-28' & 8031'-44'
I.P. 19 BOPD + 478 MCFD
FTP 280# on 64/64" Ck.
SITP 390#
GOR 25158:1, Gty. 54°

Comp.: 8-27-18
Perfs. 8153'-64' & 8176'-80'
I.P. 1015 MCFD + 98 BCPD
FTP 1500# on 11/64" Ck.
SITP 2400#
GOR 10357:1, Gty. 59°

Comp.: 1-22-57
Perfs. 8390'-8409'
I.P. 1812 MCFD + 111 BOPD
FTP 2600# on 12/64" Ck.
GOR 16326:1, Gty. 59.4°

Cum. Prod.
1143 MCFG + 904 BO

EXHIBIT NO. 5
DOCKET NO. 18-623 DATE: 12-4-18

OLEUM OPERATING COMPANY, L.C.

THOMPSON BLUFF FIELD
JEFFERSON DAVIS PARISH, LOUISIANA

CORRELATION SECTION
A-A'

BRYAN GROVES
OIL & GAS GEOLOGIST
www.bryangrovesgeology.com

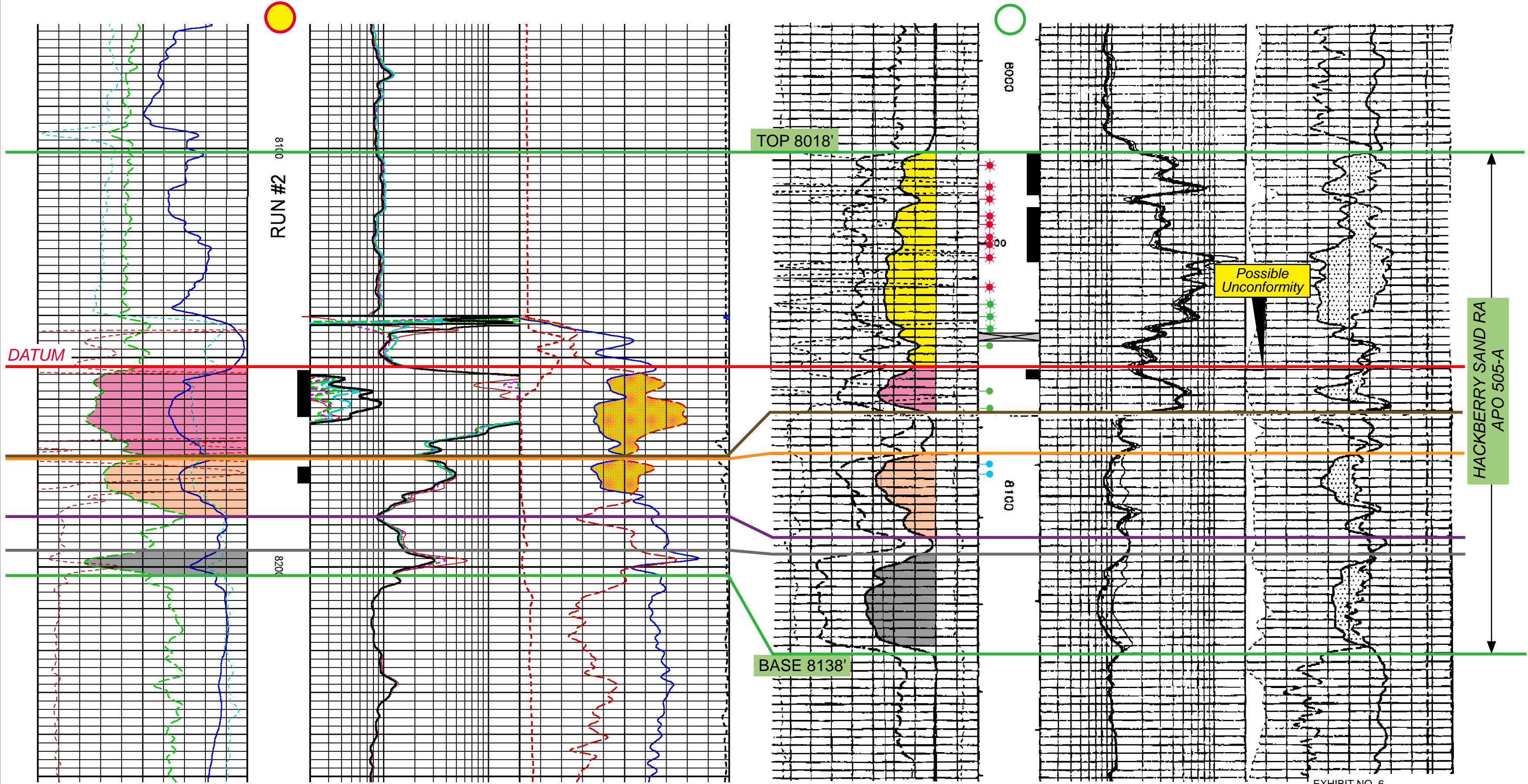
BRYAN GROVES
OIL & GAS GEOLOGIST
UNITIZATION / 3-D INTERPRETATION
www.bryangrovesgeology.com

WEST
B

CAIRN ENERGY PARTNERS, LLC
QUATRE MINERAL NO. 1
Sec. 26, T 7 S - R 7 W
SN: 251076

OLEUM OPERATING CO., L.C.
(HS RESOURCES, INC.)
TEXACO 26 NO. 1
Sec. 26, T 7 S - R 7 W
SN: 224491

EAST
B'



Comp.: 8-27-18
Perfs. 8153'-64' & 8176'-80'
I.P. 1015 MCFD + 98 BCPD
FTP 1500# on 11/64" Ck.
SITP 2400#
GOR 10357:1, Gty. 59°

Comp.: 9-14-00
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I.P. 460 BOPD + 325 MCFD + 1 BWPD
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TD 8252'
12.6# mud

Recomp: 3-8-12
Perfs. 8018'-28' & 8031'-44'
I.P. 19 BOPD + 478 MCFD
FTP 280# on 64/64" Ck.
SITP 390#
GOR 25158:1, Gty. 54°

Recomp: 4-5-06
Set Plug - Isolate Perfs. 8070'-72'
Perf. 8031'-44'
I.P. 20 BOPD + 1303 MCFD
FTP 1350# on 13/64" Ck.
SITP 25#, 1.0% BSW
GOR 65150:1, Gty. 61°

EXHIBIT NO. 6
DOCKET NO. 18-623
DATE: 12-4-18

OLEUM OPERATING COMPANY, L.C.

THOMPSON BLUFF FIELD
JEFFERSON DAVIS PARISH, LOUISIANA

CORRELATION SECTION
B-B'

BRYAN GROVES
OIL & GAS GEOLOGIST
www.bryangrovesgeology.com

EXHIBIT NO. 7
DOCKET NO. 18-623 DATE: 12-4-18

R 7 W 23 24

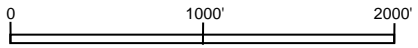
T 7 S

25

36

OLEUM OPERATING COMPANY, L.C.

THOMPSON BLUFF FIELD
JEFFERSON DAVIS PARISH, LOUISIANA
PROPOSED UNIT
HACKBERRY SAND



BRYAN GROVES
OIL & GAS GEOLOGIST
www.bryangrovesgeology.com

NOTE: ALL BOUNDARIES ARE GEOGRAPHIC
— COINCIDENT WITH ORDER 505-A
○ PROPOSED UNIT WELL

Stroud Parker
1
8100' MD
7953' VD

Quatre Mineral, LLC

Kenneth R. Parker, et al

Quatre Mineral, LLC

Earline E. Angelle Trust
S. W. Richardson
A. Houssiere

Houssiere Interest, LLC, et al

J. A. Bel, et al

Texaco Nickerson

1
7900'

27

HBY RA SUB
Quatre Min. No. 1
±108 ACRES

Kenneth R. Parker, et al

±2010'

Cairn Quatre Min.
1

Quatre Mineral, LLC

8534'
Woolf & Magee Quatre

122.9' ±1950'

±1115'

Oleum (H. S. Res.)
Texaco 26

1

8252'

26

Pickens Nickerson
1

7615'

Chevron, et al

Florien Giauque Est.

Cornell Quatre
3

7318'

1

7320'

Continental Quatre
1

8825'

Texas Gulf Faye
1

2
2971'

Cajun Watson
1

Texas Gulf Blake

Continental J. A. Bel, et al
1

1
7302'

1
8836'

J. Grigsby Bel, et al
1

1
7350'

D. Attaway

1
7500'

34

Lamson, et al
Mrs. J. A. Bel, et al

O. S. & S. Bel
1

1
7350'

O. S. & S. Bel
1

1
7252'

Kimball Bel
1

Katherine Bel Hanszman, et al
1

1
7275'

J. A. Bel, et al
1

1

Kimball Fay
1

1
7450' ST
6802' OH

The Texas Co.

26

E. S. Clement

Lock-Moore & Co. Ltd.

W. A. Poe

35

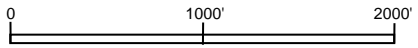
The Texas Co.

BRYAN GROVES
OIL & GAS GEOLOGIST
UNITIZATION / 3-D INTERPRETATION
www.bryangrovesgeology.com

The Texas Co.

OLEUM OPERATING COMPANY, L.C.

THOMPSON BLUFF FIELD
JEFFERSON DAVIS PARISH, LOUISIANA
UNIT COMPARISON



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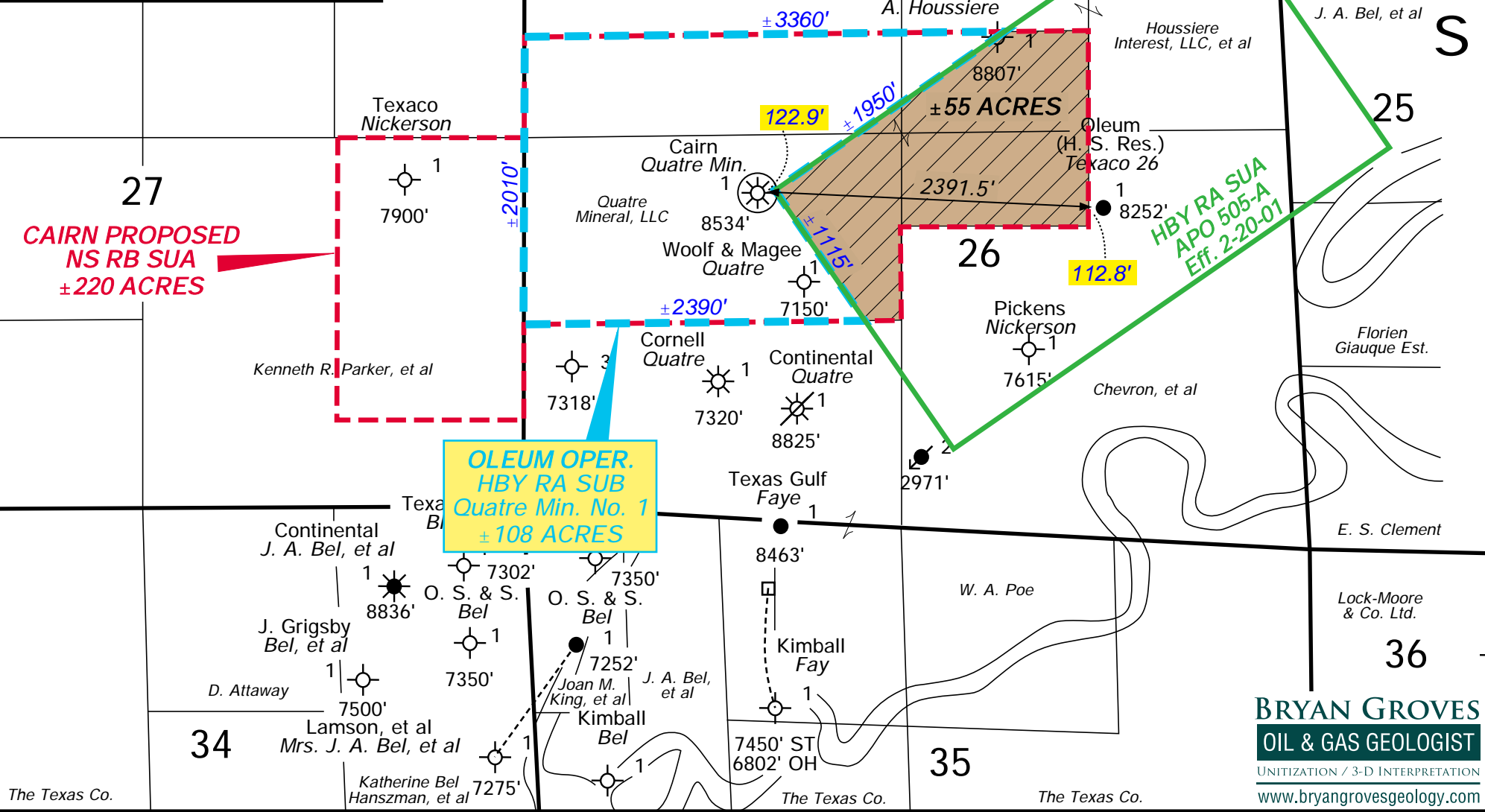
**NOTE: ALL BOUNDARIES ARE GEOGRAPHIC
— COINCIDENT WITH ORDER 505-A**

T
7
S

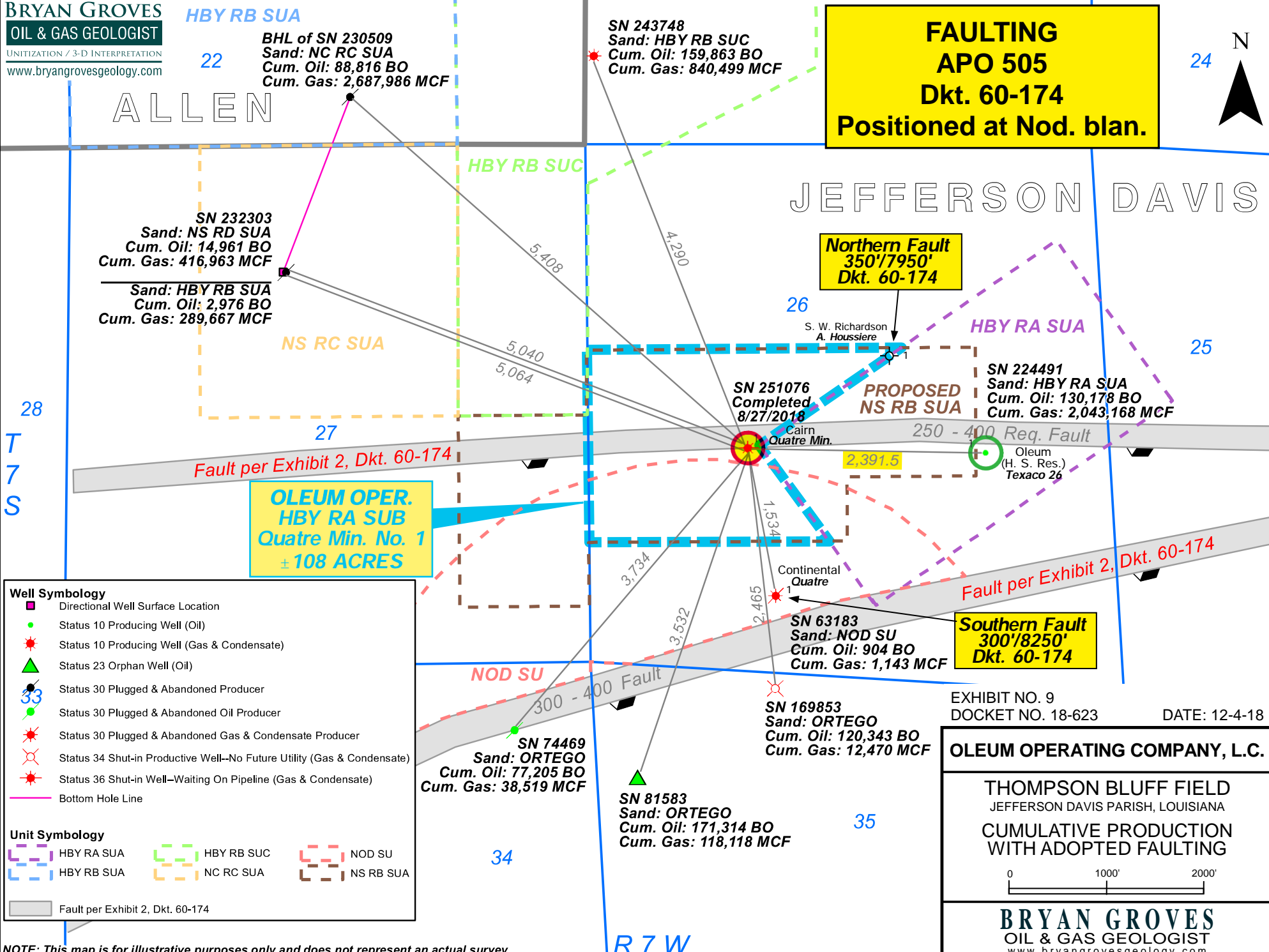
**CAIRN PROPOSED
NS RB SUA
± 220 ACRES**

**HBY RA SUA
APO 505-A
Eff. 2-20-01**

**OLEUM OPER.
HBY RA SUB
Quatre Min. No. 1
± 108 ACRES**



HBY RB SUA



OLEUM OPER. HBY RA SUB
Quatre Min. No. 1
± 108 ACRES

FAULTING
APO 505
Dkt. 60-174
Positioned at Nod. blan.



Well Symboly

- Directional Well Surface Location
- Status 10 Producing Well (Oil)
- ★ Status 10 Producing Well (Gas & Condensate)
- ▲ Status 23 Orphan Well (Oil)
- Status 30 Plugged & Abandoned Producer
- Status 30 Plugged & Abandoned Oil Producer
- ★ Status 30 Plugged & Abandoned Gas & Condensate Producer
- ⊗ Status 34 Shut-in Productive Well—No Future Utility (Gas & Condensate)
- ★ Status 36 Shut-in Well—Waiting On Pipeline (Gas & Condensate)
- Bottom Hole Line

Unit Symboly

- HBY RA SUA
- HB Y RB SUA
- NC RC SUA
- NOD SU
- NS RB SUA
- Fault per Exhibit 2, Dkt. 60-174

NOTE: This map is for illustrative purposes only and does not represent an actual survey.

EXHIBIT NO. 9
 DOCKET NO. 18-623
 DATE: 12-4-18

OLEUM OPERATING COMPANY, L.C.

THOMPSON BLUFF FIELD
 JEFFERSON DAVIS PARISH, LOUISIANA

CUMULATIVE PRODUCTION
 WITH ADOPTED FAULTING

0 1000' 2000'

HBY RB SUA

22

BHL of SN 230509
 Sand: NC RC SUA
 Cum. Oil: 88,816 BO
 Cum. Gas: 2,687,986 MCF

SN 243748
 Sand: HBY RB SUC
 Cum. Oil: 159,863 BO
 Cum. Gas: 840,499 MCF

FAULTING
APO 505
Dkt. 60-174
Positioned at HBY

24



ALLEN

HBY RB SUC

JEFFERSON DAVIS

SN 232303
 Sand: NS RD SUA
 Cum. Oil: 14,961 BO
 Cum. Gas: 416,963 MCF

Sand: HBY RB SUA
 Cum. Oil: 2,976 BO
 Cum. Gas: 289,667 MCF

NS RC SUA

Northern Fault
350'/7950'
Dkt. 60-174

HBY RA SUA

25

28

T
7
S

Fault per Exhibit 2, Dkt. 60-174
(Adjusted for Hackberry Horizon)

27

OLEUM OPER.
HBY RA SUB
Quatre Min. No. 1
± 108 ACRES

SN 251076
 Completed
 8/27/2018
 Cairn
 Quatre Min.

PROPOSED
NS RB SUA
2,391.5

SN 224491
 Sand: HBY RA SUA
 Cum. Oil: 130,178 BO
 Cum. Gas: 2,043,168 MCF
 Oleum
 (H. S. Res.)
 Texaco 26

Fault per Exhibit 2, Dkt. 60-174
(Adjusted for Hackberry Horizon)

- Well Symbology**
- Directional Well Surface Location
 - Status 10 Producing Well (Oil)
 - Status 10 Producing Well (Gas & Condensate)
 - Status 23 Orphan Well (Oil)
 - Status 30 Plugged & Abandoned Producer
 - Status 30 Plugged & Abandoned Oil Producer
 - Status 30 Plugged & Abandoned Gas & Condensate Producer
 - Status 34 Shut-in Productive Well—No Future Utility (Gas & Condensate)
 - Status 36 Shut-in Well—Waiting On Pipeline (Gas & Condensate)
 - Bottom Hole Line
- Unit Symbology**
- HBY RA SUA
 - HBY RB SUC
 - NOD SU
 - HBY RB SUA
 - NC RC SUA
 - NS RB SUA
 - Fault per Exhibit 2, Dkt. 60-174

NOD SU

300 - 400

3,734

3,532

SN 74469
 Sand: ORTEGO
 Cum. Oil: 77,205 BO
 Cum. Gas: 38,519 MCF

SN 81583
 Sand: ORTEGO
 Cum. Oil: 171,314 BO
 Cum. Gas: 118,118 MCF

SN 63183
 Sand: NOD SU
 Cum. Oil: 904 BO
 Cum. Gas: 1,143 MCF

Southern Fault
300'/8250'
Dkt. 60-174

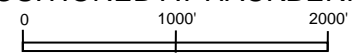
SN 169853
 Sand: ORTEGO
 Cum. Oil: 120,343 BO
 Cum. Gas: 12,470 MCF

Continental
 Quatre

EXHIBIT NO. 10
 DOCKET NO. 18-623
 DATE: 12-4-18

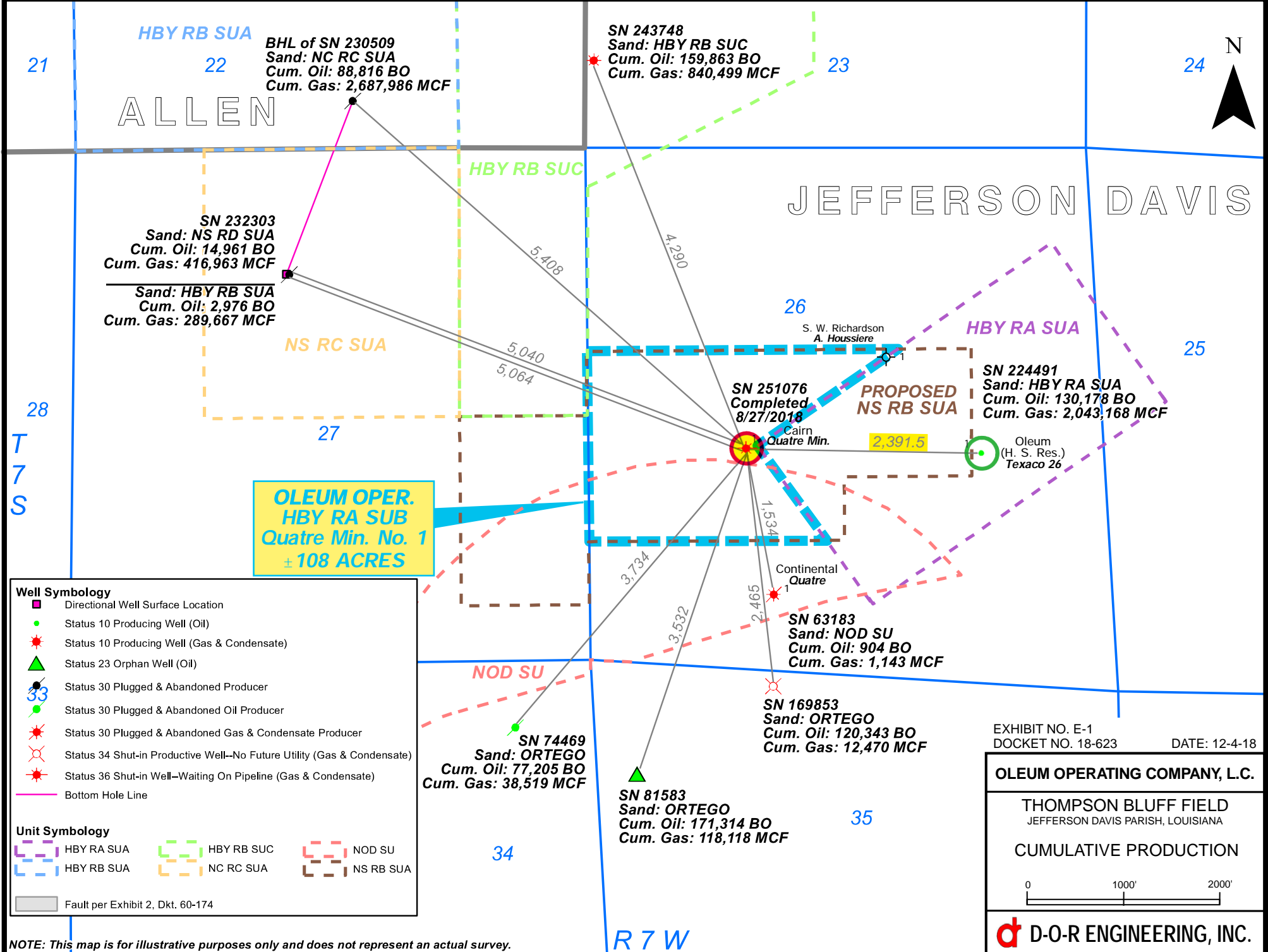
OLEUM OPERATING COMPANY, L.C.

THOMPSON BLUFF FIELD
 JEFFERSON DAVIS PARISH, LOUISIANA
 CUMULATIVE PRODUCTION
 WITH ADOPTED FAULTING
 POSITIONED AT HACKBERRY



NOTE: This map is for illustrative purposes only and does not represent an actual survey.

R 7 W



Well Symboly

- Directional Well Surface Location
- Status 10 Producing Well (Oil)
- ★ Status 10 Producing Well (Gas & Condensate)
- ▲ Status 23 Orphan Well (Oil)
- Status 30 Plugged & Abandoned Producer
- Status 30 Plugged & Abandoned Oil Producer
- ★ Status 30 Plugged & Abandoned Gas & Condensate Producer
- ⊗ Status 34 Shut-in Productive Well—No Future Utility (Gas & Condensate)
- ★ Status 36 Shut-in Well—Waiting On Pipeline (Gas & Condensate)
- Bottom Hole Line

Unit Symboly

- HBYSUA
- HBYSUA
- NOD SU
- HBYSUA
- NSRC SUA
- NSRB SUA
- Fault per Exhibit 2, Dkt. 60-174

**OLEUM OPER.
HBYSUA SUB
Quatre Min. No. 1
± 108 ACRES**

EXHIBIT NO. E-1
DOCKET NO. 18-623 DATE: 12-4-18

OLEUM OPERATING COMPANY, L.C.

THOMPSON BLUFF FIELD
JEFFERSON DAVIS PARISH, LOUISIANA

CUMULATIVE PRODUCTION

0 1000' 2000'

d D-O-R ENGINEERING, INC.

NOTE: This map is for illustrative purposes only and does not represent an actual survey.

FESCO, LTD.

1408 East Main - Alice, Texas 78332

FLOWING GRADIENT SURVEY

COMPANY : H S Resources, Inc. TEST DATE : 09/14/00
 WELL : Texaco No. 26-1 FIELD : Topsy
 STATUS : Flowing PARISH : Jefferson Davis, La

WELL DATA: Wellhead connection: 2" EUE Gauge Type : Weatherford
 Elevation: 16 ft above GL Range : 15000 psia
 2-3/8" Tubing set at 7946 ft (EOT) Gauge SN : 710-2151
 Perforations: 8070 - 8072 ft Gauge O.D. : 1.3125 inch
 Datum : 8071 ft Gauge Depth: 8071 ft

TEST DATA

STOP DEPTH (MD) ft	STOP DEPTH (TVD) ft	PRESSURE (psiA)	TEMPERATURE (deg F)	DELTA PRESSURE (psi)	DELTA DEPTH (ft)	PRESSURE GRADIENT (psi/ft)	TEMPERATURE GRADIENT (deg F/ft)
0	0	1790.86	79.34	----	----	-.----	-.----
1000	1000	2080.64	86.45	289.78	1000	0.2898	0.00711
2000	2000	2351.35	95.13	270.71	1000	0.2707	0.00868
3000	3000	2620.90	105.86	269.55	1000	0.2695	0.01073
4000	4000	2892.80	119.48	271.90	1000	0.2719	0.01362
5000	5000	3177.93	133.11	285.13	1000	0.2851	0.01363
6000	6000	3460.26	147.24	282.33	1000	0.2823	0.01413
6500	6500	3601.79	155.31	141.53	500	0.2831	0.01614
7000	7000	3742.62	162.22	140.83	500	0.2817	0.01382
7500	7500	3882.01	170.27	139.39	500	0.2788	0.01610
8000	8000	4021.42	177.22	139.41	500	0.2788	0.01390
8071	8071	4044.45	179.22	23.03	71	0.3244	0.02817

DATA MEASURED AT DATUM

8071 8071 4044.45 179.22 0 0 0.3244 (avg) 0.01238

GAUGE AT SURFACE...: Time: 23:37:00 Tubing: 1785 psig (DWG) Casing: 120 psig
 GAUGE ON BOTTOM...: Time: 01:58:00 Tubing: 1845 psig (DWG) Casing: 140 psig

FLUID LEVELS.....: Oil.: Flowing Water.: Flowing

REMARKS: Descending flowing gradient stops.
 Stop time: 10 minutes.
 Cleared perforations to 8072 ft with 1.25" weight bar before RIH with gauge.

Technician: J. Jackson

Certified: FESCO, Ltd. - Beaumont, Texas

EXHIBIT NO. E-2A DOCKET NO. 18-623 DATE: 12-4-18

By: Ted Brice
 District Manager
 (800) 375-3100

OLEUM OPERATING COMPANY, L.C.

THOMPSON BLUFF FIELD
 JEFFERSON DAVIS PARISH, LOUISIANA

TEXACO 26-1
 PRESSURE GRADIENT SURVEY
 FLOWING

 D-O-R ENGINEERING, INC.

STATIC GRADIENT SURVEY

COMPANY : H S Resources, Inc. TEST DATE : 09/24/00
 WELL : Texaco No. 26-1 FIELD : Topsy
 STATUS : Shut in for 152 hours PARISH : Jefferson Davis, La

WELL DATA: Wellhead connection: 2" EUE Gauge Type : Weatherford
 Elevation: 16 ft above GL Range : 15000 psia
 2-3/8" Tubing set at 7946 ft (EOT) Gauge SN : 710-2151
 Perforations: 8070 - 8072 ft Gauge O.D. : 1.3125 inch
 Datum : 8071 ft Gauge Depth: 8071 ft

TEST DATA

STOP DEPTH (MD) ft	STOP DEPTH (TVD) ft	PRESSURE (psia)	TEMPERATURE (deg F)	DELTA PRESSURE (psi)	DELTA DEPTH (ft)	PRESSURE GRADIENT (psi/ft)	TEMPERATURE GRADIENT (deg F/ft)
0	0	1983.43	84.10	---	---	---	---
1000	1000	2048.06	88.96	64.63	1000	0.0646	0.00486
2000	2000	2301.93	100.14	253.87	1000	0.2539	0.01118
3000	3000	2603.48	111.82	301.55	1000	0.3016	0.01168
4000	4000	2900.71	125.50	297.23	1000	0.2972	0.01368
5000	5000	3193.30	139.62	292.59	1000	0.2926	0.01412
6000	6000	3480.42	151.61	287.12	1000	0.2871	0.01199
6500	6500	3621.52	158.25	141.10	500	0.2822	0.01328
7000	7000	3761.83	165.08	140.31	500	0.2806	0.01366
7500	7500	3900.37	172.24	138.54	500	0.2771	0.01432
8000	8000	4036.65	179.18	136.28	500	0.2726	0.01388
8071	8071	4054.59	179.83	17.94	71	0.2527	0.00915

DATA MEASURED AT DATUM

8071	8071	4054.59	179.83	0	0	0.2527	0.01186 (avg)
------	------	---------	--------	---	---	--------	---------------

GAUGE OFF BOTTOM...: Time: 07:18:07 Tubing: 1976 psig (DWG) Casing: 0 psig
 GAUGE AT SURFACE...: Time: 09:37:07 Tubing: 1976 psig (DWG) Casing: 0 psig
 FLUID LEVELS.....: Oil.: 1201 ft Water.: None
 PREVIOUS TEST.....: Date: Initial
 REMARKS: Ascending static gradient stops.
 Stop time: 10 minutes.
 Cleared perforations to 8072 ft with 1.25" weight bar on 09/14/00.

Technician: K. Lanier Certified: FESCO, Ltd. - Beaumont, Texas
 EXHIBIT NO. E-2B DOCKET NO. 18-623 DATE: 12-4-18
 By: Ted Brice District Manager (800) 375-3100


OLEUM OPERATING COMPANY, L.C.
 THOMPSON BLUFF FIELD
 JEFFERSON DAVIS PARISH, LOUISIANA
 TEXACO 26-1
 PRESSURE GRADIENT SURVEY
 STATIC
 D-O-R ENGINEERING, INC.

TEXACO 26-1 - SN 224491
WELL TESTS

ACTUAL MTHLY PROD
CONVERTED TO DAILY

RPT TYP	TEST DATE	OIL POT	COND	GAS DEL	WATER	BSW%	FLOW PRES	SHUTIN PRES	CHOKE	UPPER PERF	LOWER PERF	OIL, BOPD	GAS, MCFD
SDM2O	6/21/2001	360		1,400			2,400		11	8,070	8,072	340	1,391
DM-1R	9/12/2001	311			20	6	2,300		15			266	3,587
DM-1R	3/21/2002	12			10	6	2,000	2,600	15	8,070	8,072	143	2,383
DM-1R	9/25/2002	83			20	6	1,600	2,600	15	8,070	8,072	91	2,150
DM-1R	3/18/2003	63			24	6	1,300	2,600	18	8,070	8,072	66	1,412
DM-1R	9/12/2003	46			22	6	1,150	2,600	18	8,070	8,072	45	1,171
DM-1R	3/16/2004	46			22	6	1,150	2,600	18	8,070	8,072	29	652
DM-1R	10/3/2004	27			18	6	1,150	2,600	119	8,070	8,072	28	535
DM-1R	3/16/2005	25			14	6	675	2,600	19	8,070	8,072	20	434
DM-1R	9/3/2005	20			10	0	800		19	8,070	8,072	12	266
DM-1R	4/11/2006	20				0	1,350		13	8,031	8,072	19	1,045
SDM2O	5/12/2006	45		1,292		0	1,350		13	8,031	8,072	23	1,353
DM-1R	9/12/2006	18			0	0	1,200		13	8,031	8,072	11	1,090
DM-1R	3/19/2007	22				0	1,125		15	8,031	8,072	19	1,258
DT-1	10/14/2007		26	2,007	2		720	1,250	24		8,072	17	1,766
DM-1R	4/12/2009	8			2	0	300	480	38	8,031	8,072	8	560
DM-1R	8/15/2009	4			2	0	300	380	48	8,031	8,072	4	417
DM-1R	4/15/2010	13			3	1	220	500	48	8,031	8,072	13	568
DM-1R	10/15/2010	20				0	400		64	8,031	8,072	19	463
DM-1R	3/28/2011	20			8	1	110	310	64	8,031	8,072	17	419
DM-1R	10/15/2011	13			8		55	415	64	8,031	8,072	11	287
DM-1R	4/15/2012	15				1	265	390	64	8,031	8,072	8	336
DM-1R	10/15/2012	14			8	1	70	415	64	8,018	8,044	14	448
DM-1R	4/16/2013	14			7	1	50	360	64	8,018	8,044	11	331
DM-1R	10/1/2013	15			18	1	45	390	64	8,031	8,072	16	279
DM-1R	3/25/2014	8			15		45		64	8,031	8,072	15	295
DM-1R	10/9/2014	8		327	17	68	50		64	8,018	8,044	7	236
DM-1R	3/24/2015	5		310	13	72	90		12	8,018	8,044	11	303
DM-1R	9/17/2015	5		296	15	75	64		64	8,018	8,044		229
DM-1R	3/17/2016	7		293	17	71	63		64	8,018	8,044	5	230
DM-1R	10/11/2016	2		234	17	89	63		64	8,018	8,044	5	174
DM-1R	4/18/2017	2		0	17	89	63	0	4	8,018	8,044	5	170
DM-1R	10/16/2017	2		0	17	0	63	0	64	8,018	8,044	6	198
DM-1R	4/10/2018	2		0	17	0	63	0	64	8,018	8,044	4	121
DM-1R	10/2/2018	2		0	17	64	63		64	8,018	8,044		

EXHIBIT NO. E-3
DOCKET NO. 18-623 DATE: 12-4-18

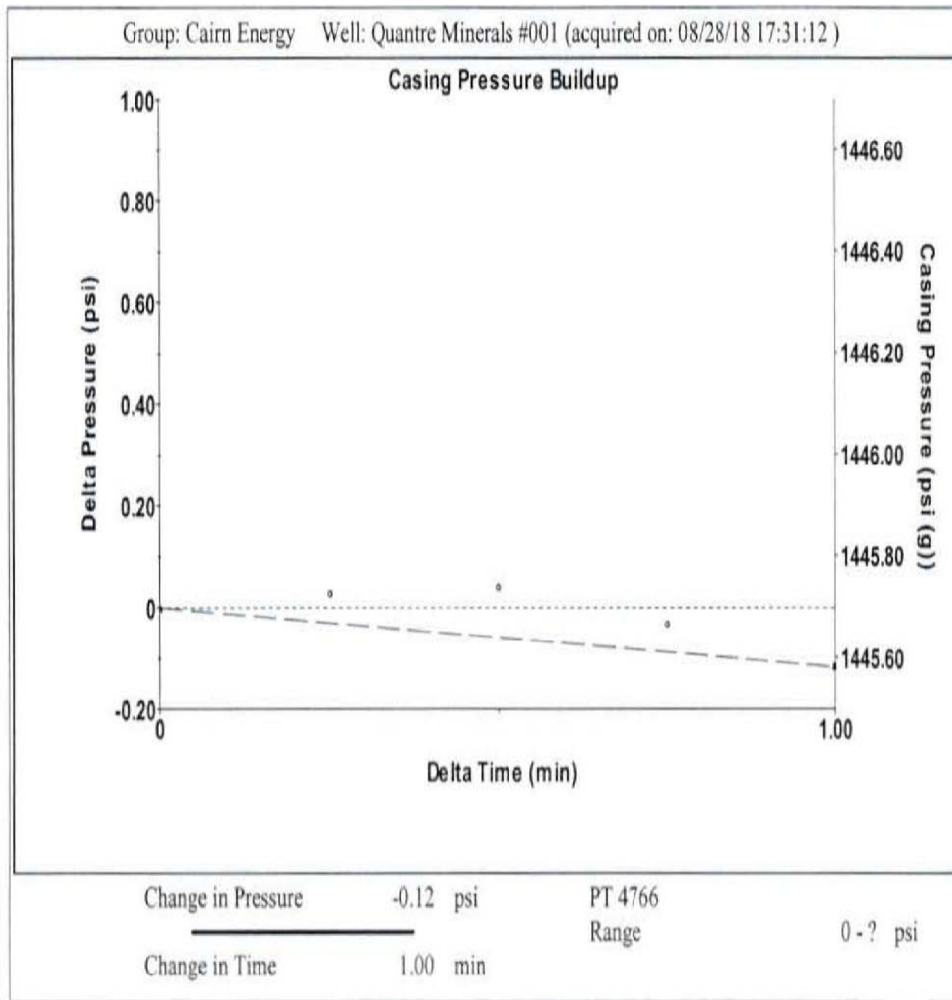
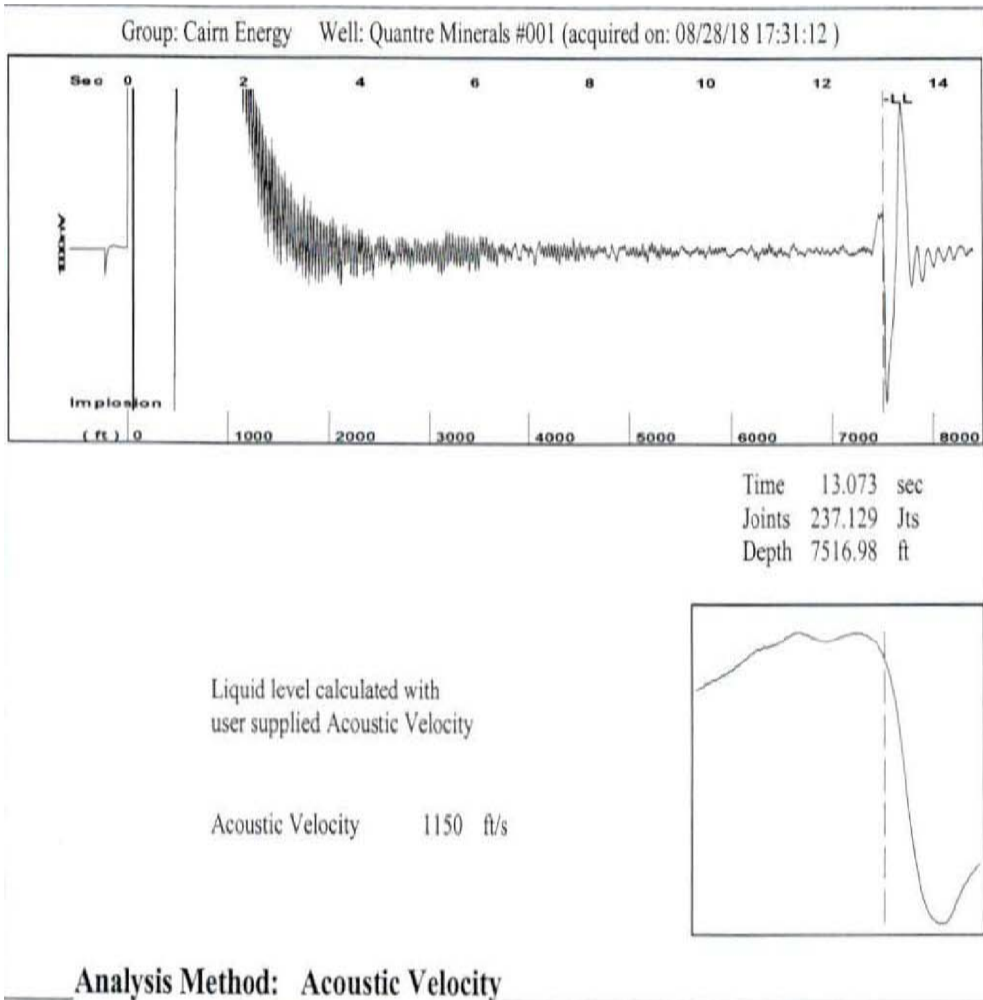
OLEUM OPERATING COMPANY, L.C.
THOMPSON BLUFF FIELD JEFFERSON DAVIS PARISH, LOUISIANA
TEXACO 26-1 COMPARISON OF TESTS TO PRODUCTION
 D-O-R ENGINEERING, INC.

**Cairn Energy Partners, LLC
Daily Report**

DATE:	<u>28-Aug-18</u>	REPORT #	<u>7</u>
PERMIT #	<u>L #Q577-18</u>	ACT.DAYS	<u>7</u>
WELL NAME:	<u>Quantre Minerals #001</u>	DWC	<u>9K</u>
API #	<u>17-053-21499-0000</u>	TWC	<u>163K</u>
LOCATION:	<u>Ragley, LA</u>	RIG:	<u>Moncla #91</u>
PARISH:	<u>Jefferson Davis</u>	LAST BOP TEST:	
WELL TYPE	<u>Gas</u>	CASING:	<u>10-3/4", 40.50#, J-55, ST&C</u>
ELEVATION:	<u>plus 11'</u>	INTERMEDIATE CSG:	<u>7-5/8", 29.7#, HCP-110, LT&C</u>
KB:	<u>15'</u>	PRODUCTION CASING:	<u>4-1/2", 11.6#, P-110, 8rd,</u>
		TUBING TAIL:	<u>2-3/8", 4.7#, L-80, ERW @8,068'</u>
		CO. MAN	<u>Robert Vickery (209.329.7742)</u>

Coordinates X=1,455,75637 / Y=640,103,10 / NAD 1927 South Zone / Section 26, T 7S, R 7W, MDB&M Jefferson Davis Parish, Louisiana.

Time	HRS.	OPERATIONS SUMMARY
07:00	4	Release and rig down workover rig. Rig down Oil States flare unit and move toward the so I don't have to be a firefighter and put out fires.
11:00	5.5	Oil States open up well, begin flow test. Flow well on 12/64" choke, 1,500 psi on tubing and 1,450 psi on casing, 900 mcf/d Total pump shoot fluid level at 7,516' before shutting off flow through tubing.
16:30	0.5	Shut in well at 5:30 PM. Wait 30 minutes. Shoot fluid level at 7,404'
17:00	2.0	After two hours pressure remain the same at 1,450 psi tubing and 1,450 psi on casing



Group: Cairn Energy Well: Quantre Minerals #001 (acquired on: 08/28/18 17:31:12)

Production	Potential	Casing Pressure	Producing
Oil -*-	-*- BBL/D	1445.7 psi (g)	
Water -*-	-*- BBL/D	Casing Pressure Buildup	
Gas -*-	-*- Mscf/D	-0.116 psi	
		1.00 min	
IPR Method	Vogel	Gas/Liquid Interface Pressure	Annular Gas Flow
PBHP/SBHP	-*-	1863.2 psi (g)	0 Mscf/D
Production Efficiency	0.0	Liquid Level Depth	% Liquid
Oil 40 deg.API		7516.98 ft	100 %
Water 1.05 Sp.Gr.H2O		Tubing Intake Depth	
Gas 0.74 Sp.Gr.AIR		8068.00 ft	
Acoustic Velocity	1150 ft/s	Formation Depth	
		8153.00 ft	
Formation Submergence		Tubing Intake	
Total Gaseous Liquid Column HT (TVD)	636 ft	2113.7 psi (g)	
Equivalent Gas Free Liquid HT (TVD)	636 ft	Producing BHP	
		2152.4 psi (g)	
Acoustic Test	<i>Producing</i>	Static BHP	
		-*- psi (g)	

Group: Cairn Energy Well: Quantre Minerals #001 (acquired on: 08/28/18 17:31:12)

Echo Meter Producing (8/28/2018)

Gas Gradient (Producing) = $\frac{(1863 \text{ psi} - 1446 \text{ psi})}{7517 \text{ ft}} = 0.055 \frac{\text{psi}}{\text{ft}}$

Liquid Gradient (Producing) = $\frac{(2152 \text{ psi} - 1863 \text{ psi})}{(8153 \text{ ft} - 7517 \text{ ft})} = 0.454 \frac{\text{psi}}{\text{ft}}$

Entered Acoustic Velocity for Liquid Level depth determination

We will come back to the following calculation ...

Using a Liquid Gradient of 0.252 psi/ft

Using $0.252 \frac{\text{psi}}{\text{ft}}$, $P_i = 1863 \text{ psi} + \left(0.252 \frac{\text{psi}}{\text{ft}}\right) \times (8153 \text{ ft} - 7517 \text{ ft}) = 2023 \text{ psi}$

Fluid Level Shot After 15.5 Hours Shut-in

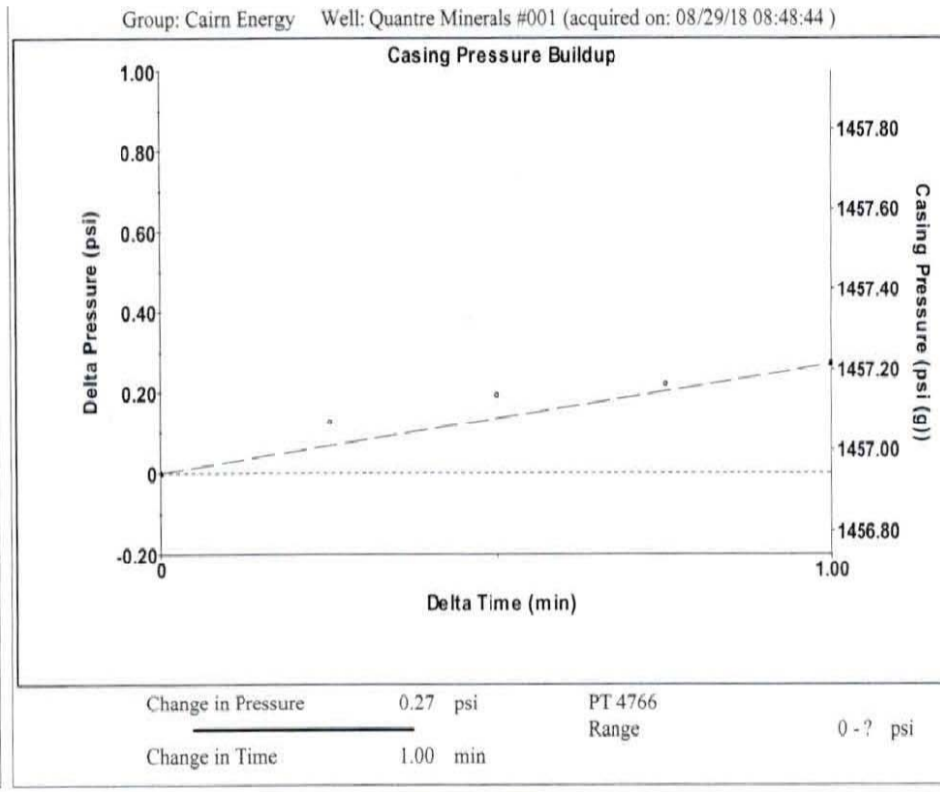
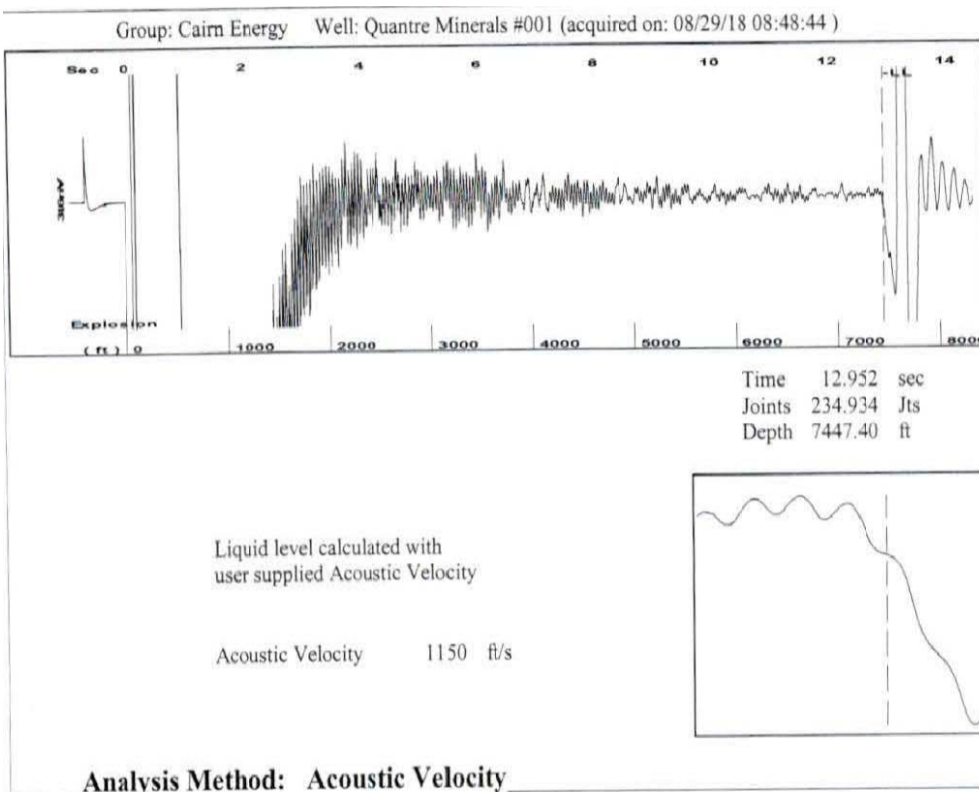
(Well Shut-in 21.5 Hours by End of Day)

Cairn Energy Partners, LLC
Daily Report

DATE:	29-Aug-18	DWC	14K	REPORT #	8
PERMIT #	L #Q577-18	TWC	182K	ACT.DAYS	8
WELL NAME:	Quantre Minerals #001	RIG:	Moncla #91	TOTAL DEPTH:	8,534'
API #	17-053-21499-0000	LAST BOP TEST:		PRESENT DEPTH	8,435'
LOCATION:	Ragley, LA	CASING:	10-3/4", 40.50#, J-55, ST&C	FORMATION:	Struma
PARISH:	Jefferson Davis	INTERMEDIATE CSG:	7-5/8", 29.7#, HCP-110, LT&C	PACKER:	
WELL TYPE	Gas	PRODUCTION CASING:	4-1/2", 11.6#, P-110, 8rd,	SET @	3,070'
ELEVATION:	plus 11'	TUBING TAIL:	2-3/8", 4.7#, L-80, ERW @8,068'	SET @	8,146'
KB:	15'			SET @	8,485'
				CO. MAN	Robert Vickery (209.329.7742)

Coordinates X=1,455,75637 / Y=640,103,10 / NAD 1927 South Zone / Section 26, T 7S, R 7W, MDB&M Jefferson Davis Parish, Louisiana.

Time	HRS.	OPERATIONS SUMMARY
07:00	8	<p>Found well with 1,450 psi / 1,450 psi. Load out workover rig. Release, rig down and load out Oil States flowback equipment. Total Pump shot fluid level @7,447'</p> <p>Total condensate recovered 15 bbls / No water recovered from the flow test. Load up 11 jts of 2-3/8" tubing, two 7-5/8" cutoffs, six bags full of thread protectors on Hornet truck Tubing going back to Tadpole for credit at \$4.50 per ft. Hornet will dispose of the thread protectors and cutoffs. Dynamite Dumpster pick up trash bin #30-046</p> <p>Calcasieu vacuum out storage tank for ILM can pick them up tomorrow. Tank #GB-70 & GB-13 Sunbelt will pick up forklift tomorrow. Also Kjon will pick up Port o Johns</p>
15:00		Well shut in with 1,450 psi on both sides.



Group: Cairn Energy Well: Quantre Minerals #001 (acquired on: 08/29/18 08:48:44)

Production	Potential	Casing Pressure	Producing
Oil -*- BBL/D	-*- BBL/D	1456.9 psi (g)	Annular Gas Flow
Water -*- BBL/D	-*- BBL/D	Casing Pressure Buildup	32 Mscf/D
Gas -*- Mscf/D	-*- Mscf/D	0.3 psi	% Liquid 54 %
		1.00 min	
IPR Method Vogel		Gas/Liquid Interface Pressure	
PBHP/SBHP -*-		1875.0 psi (g)	
Production Efficiency 0.0		Liquid Level Depth	
Oil 40 deg.API		7447.40 ft	
Water 1.05 Sp.Gr.H2O		Tubing Intake Depth	
Gas 0.74 Sp.Gr.AIR		8068.00 ft	
Acoustic Velocity 1150 ft/s		Formation Depth	
		8153.00 ft	
Formation Submergence		Tubing Intake	
Total Gaseous Liquid Column HT (TVD) 706 ft		2028.1 psi (g)	
Equivalent Gas Free Liquid HT (TVD) 392 ft		Producing BHP	
Acoustic Test		2053.2 psi (g)	
		Static BHP	
		-*- psi (g)	

Group: Cairn Energy Well: Quantre Minerals #001 (acquired on: 08/29/18 08:48:44)

Echo Meter Static for 15.5 Hrs (8/28/2018)

$$\text{Gas Gradient (Static)} = \frac{(1875 \text{ psi} - 1457 \text{ psi})}{7447 \text{ ft}} = 0.056 \frac{\text{psi}}{\text{ft}}$$

$$\text{Liquid Gradient (Static)} = \frac{(2053 \text{ psi} - 1875 \text{ psi})}{(8153 \text{ ft} - 7447 \text{ ft})} = 0.252 \frac{\text{psi}}{\text{ft}}$$

$$\text{Using } 0.252 \frac{\text{psi}}{\text{ft}}, P_i = 1875 \text{ psi} + \left(0.252 \frac{\text{psi}}{\text{ft}}\right) \times (8153 \text{ ft} - 7447 \text{ ft}) = 2053 \text{ psi}$$

Calculation of Initial Reservoir Pressure Using 59 deg. API (from Completion Test)

$$\text{Specific Gravity of Condensate} = \frac{(141.5)}{(131.5 + 59 \text{ deg.})} = 0.743$$

$$\text{Pressure Gradient of Condensate} = 0.743 \times 0.433 \frac{\text{psi}}{\text{ft}} = 0.322 \frac{\text{psi}}{\text{ft}}$$

$$\text{Using } 0.322 \frac{\text{psi}}{\text{ft}}, P_i = 1875 \text{ psi} + \left(0.322 \frac{\text{psi}}{\text{ft}}\right) \times (8153 \text{ ft} - 7447 \text{ ft}) = 2102 \text{ psi}$$

The Average Initial Reservoir Pressure is 2078 psi

CAIRN ENERGY (C4602)

Cooley's Gauging Service - Jerry W. Cooley

Quatre Mineral LLC #1 (SN 251076) - Thompson Bluff Field (8916) - Jeff Davis Parish


Date	HRS PROD	Down Time Type	DTC	CK	FTP	CP	LP	Diff.	Stat	Run / Plate Size	MCF	Oil Tank		Oil Tank		TARGA	OLEUM	Oil In Tank			OIL BBLs	Runs BBLs	Gauge		WTR Bbls								
												201251	400	201252	400			GAS SALES	FIVE JAB	400 BBL Tank			Ft	In									
Yesterday's Gauge												Ft	In	Ft	In	METER	GAS SALES	Ft	In	Bbls													
2	24.0			13	1415	1485	724	44	724	2" Run Plate 1.125 C	1577	7	1/2	0	0			1730.2	153.6	7	1	141.04			0	10 1/2	0.84						
3	24.0			13	1415	1485	728	44	728	2" Run Plate 1.125 C	1573	8	7	0	0			1715.2	142.6	8	7	171.92	30.88		0	11	0.83						
4	24.0			13	1400	1480	733	43	733	2" Run Plate 1.125 C	1565	10	2 1/2	0	0			1728.4	163.6	10	3	204.47	32.55		0	11 1/2	0.84						
5	24.0			13	1400	1480	754	42	754	2" Run Plate 1.125 C	1546	11	9 1/2	0	0			1702.2	156	11	10	236.19	31.71		1	1/2	1.67						
6	24.0			13	1400	1480	758	41	758	2" Run Plate 1.125 C	1570	13	4 1/2	0	0			1641.2	70.9	13	5	267.90	31.71		1	1	0.83						
7	24.0			13	1410	1480	752	41	752	2" Run Plate 1.125 C	1518	14	11	0	0			1746.9	228.6	14	11	298.78	30.88		1	1	0.83						
8	24.0			13	1400	1480	736	41	736	2" Run Plate 1.125 C	1531	16	5	0	0			1813.2	282.7	16	5	328.83	30.05		1	1 1/2	0.84						
9	24.0			13	1410	1470	731	42	731	2" Run Plate 1.125 C	1546	17	11	0	0			1826.2	280.6	17	11	358.87	30.04		1	2	0.83						
10	24.0			13	1400	1470	733	45	733	2" Run Plate 1.125 C	1546	19	4	0	1			1694.2	148.7	19	5	388.92	30.05		1	2 1/2	0.84						
11	24.0			13	1400	1470	740	41	740	2" Run Plate 1.125 C	1530	19	5	1	7			1691	160.7	20	12	420.63	31.71		1	3 1/2	1.67						
12	24.0			13	1400	1470	742	41	742	2" Run Plate 1.125 C	1499	19	5	3	2 1/2			1796.7	298	22	8	453.18	32.55		1	4 1/2	1.67						
13	24.0			13	1400	1470	720	26	720	2" Run Plate 1.125 C	1277	19	4 1/2	4	10			1579.2	302.1	23	15	484.89	31.71		1	5	0.83						
14	21.75	ety System Shut Down		14	1365	1455	738	30	738	2" Run Plate 1.125 C	1111	10	4 1/4	6	1 1/2			1409.4	298.2	16	6	330.08	26.29	181.10	1	6	1.67						
15	24.0			14	1370	1460	743	34	743	2" Run Plate 1.250 C	1778	10	4 1/4	7	7			2085.2	307.4	17	11	359.29	29.21		1	7	1.67						
16	24.0			15	1360	1465	760	39	760	2" Run Plate 1.250 C	1909	1	4	9	4			2211.9	303.1	10	8	213.65	35.57	181.20	1	8	1.67						
17	24.0			15	1360	1460	826	38	826	2" Run Plate 1.250 C	1981	1	4	11	3 1/2			2274	292.8	12	8	252.88	39.23		1	8 1/2	0.84						
18	24.0			15	1360	1460	776	40	776	2" Run Plate 1.250 C	1973	2	4	12	1			2279.5	306.1	14	5	288.77	35.89		1	9	0.83						
19	24.0			15	1350	1455	765	40	765	2" Run Plate 1.250 C	1974	4	4 1/2	12	1			2279.5	306.1	16	6	329.66	40.89		1	9 1/2	0.84						
20	24.0			15	1350	1455	762	40	762	2" Run Plate 1.250 C	1969	6	3	12	1			2287.1	313.4	18	4	367.22	37.56		1	10 1/2	1.67						
21	24.0			16	1340	1455	763	46	763	2" Run Plate 1.250 C	2064	8	2 1/2	12	1			2272.8	303.9	20	4	406.44	39.23		2	0	2.51						
22	24.0			16	1330	1455	776	39	776	2" Run Plate 1.250 C	2188	10	2 1/2	12	1			2352.1	288.6	22	4	446.50	40.06		2	1	1.67						
23	24.0			16	1320	1445	740	43	740	2" Run Plate 1.250 C	2197	12	3 1/2	12	1			2476.7	289.2	24	5	488.23	41.73		2	2	1.67						
24	24.0			17	1330	1450	820	29	820	2" Run Plate 1.250 C	2290	14	5	2	5			2484.7	288.1	16	10	337.17	38.64	189.70	2	3	1.67						
25	24.0			17	1320	1445	851	54	851	2" Run Plate 1.250 C	2398	16	7	2	5			2577.4	287.8	18	12	380.57	43.40		2	4	1.67						
26	24.0			17	1320	1435	790	58	790	2" Run Plate 1.250 C	2392	18	9	2	5			2677	278.6	20	14	423.97	43.40		2	6	3.34						
27	24.0			17	1315	1435	802	54	802	2" Run Plate 1.250 C	2399	19	4 1/2	3	11			2666.8	275.1	22	16	466.53	42.56		2	7	1.67						
28	24.0			18	1300	1435	813	73	813	2" Run Plate 1.250 C	2503	19	4 1/2	6	1			2666.4	267.5	25	6	509.93	43.40		2	8	1.67						
29	24.0			0	0	0	0	0	0	2" Run Plate 1.250 C	0	10	2	8	8			2762.4	259	18	10	377.23	48.30	181.00	2	10 1/2	4.20						
30	24.0			0	0	0	0	0	0	2" Run Plate 1.250 C	0	0	0	0	0			0	0	0	0	0.00	0.00				0.00						
31	24.0			0	0	0	0	0	0	2" Run Plate 1.250 C	0	0	0	0	0			0	0	0	0	0.00	0.00				0.00						
1	24.0			0	0	0	0	0	0	2" Run Plate 1.250 C	0	0	0	0	0			0	0	0	0	0.00	0.00				0.00						
741.8																								56148	6746.9				969.19	733.00			40.11

EXHIBIT NO. E-5A
DOCKET NO. 18-623 DATE: 12-4-18

OLEUM OPERATING COMPANY, L.C.

THOMPSON BLUFF FIELD
JEFFERSON DAVIS PARISH, LOUISIANA

CAIRN-QUATRE MIN. #1
DAILY PRODUCTION

 **D-O-R ENGINEERING, INC.**

Period Covered From:		Period Covered To:		Additional Run Ticket Information (Required)													
11/2/2018		12/1/2018		Date	Tank No	Ticket No	Oil Sales		Oil Sales	Barrels	TTemp	BTemp	BSW	OTemp	OGravity	Seals Off	Seals On
				From			To										
				Ft	In	Ft	In										
11/13/2018	201251	1200510	19	4 1/2	10	4 1/4	181.10	56	56	0.10%	54	66.8	564405	564424			
11/14/2018	201251	1200514	10	4 1/4	1	4	181.20	56	56	0.10%	54	66.8	564424	564428			
11/22/2018	201252	1200524	11	10 1/2	2	5	189.70	58	58	0.10%	56	67.6	9999999	564438			
11/27/2018	201251	7150794	19	2 1/2	10	2	181.00	60	60	0.10%	58	66	564428	588433			

Bbls Water for Month	40.11	Stock End of Month	0.00
Gas Prod for Month	49401.10	Add Pipeline Runs	733.00
		Less Stock First of Month	141.04
		Production for Month	591.96

EXHIBIT NO. E-5B
DOCKET NO. 18-623
DATE: 12-4-18

OLEUM OPERATING COMPANY, L.C.

THOMPSON BLUFF FIELD
JEFFERSON DAVIS PARISH, LOUISIANA

CAIRN-QUATRE MIN. #1
DAILY PRODUCTION

d D-O-R ENGINEERING, INC.

36th Day of Production

Flowing Bottom Hole Pressure
Gray Correlation
Programed by J. Langlinais, Ph D
Modified by M. Veazey, MS

Well	Cairn - Quatre Mineral #1
Field	Thompson Bluff
Top Perf	8153
Date	Daily Production from 11/28/2018

Q _g	2.50	MMCFD	Yld, bbl/MMCF
Q _c	48.3	BOPD	19.3
Q _{wtr}	4.2	BWPD	1.7

P _{wh}	1,300	psi
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API	66.00	°	Sgo	0.71646
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SG _w	1.00		N2	CO2	H2S
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SG _g	0.69		0.00312	0.00147	0
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T _s	80	°F
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T _{bh}	170	°F	Grad	0.01104	°F/ft
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P _{sep}	150.0	psi
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T _{sep}	150	°F
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Segment	ID, in	Length	Depth	T _s , °F	T _{bs} , °F	P _{bh}
one	1.995	8,068	8,068	80.0	169.1	1,752
two	4.000	83	8,151	169.1	170.0	1,756
three	4.000	1	8,152	170.0	170.0	1,756
four	4.000	1	8,153	170.0	170.0	1,756
TD		8,153				

FBHP

EXHIBIT NO. E-5C
DOCKET NO. 18-623
DATE: 12-4-18

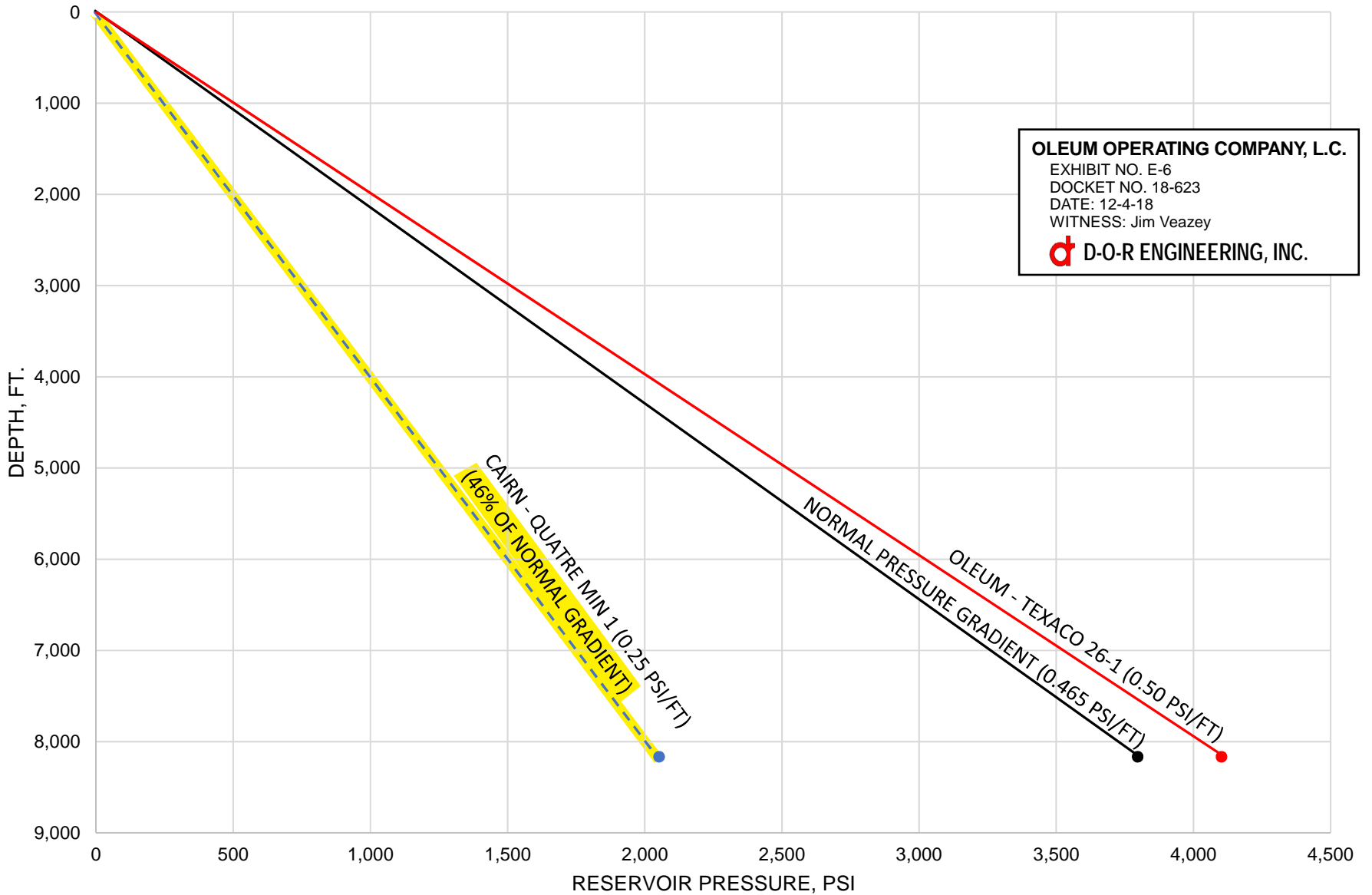
OLEUM OPERATING COMPANY, L.C.


THOMPSON BLUFF FIELD
JEFFERSON DAVIS PARISH, LOUISIANA

CAIRN-QUATRE MIN. #1
DAILY PRODUCTION

d D-O-R ENGINEERING, INC.

THOMPSON BLUFF COMPARISON OF RESERVOIR PRESSURE GRADIENTS



OLEUM OPERATING COMPANY, L.C.
EXHIBIT NO. E-6
DOCKET NO. 18-623
DATE: 12-4-18
WITNESS: Jim Veazey
 **D-O-R ENGINEERING, INC.**

Initial Reservoir Pressure Calculations in Cairn Well using Echo Meter Report

Echo Meter Producing (8/28/2018)

$$\text{Gas Gradient (Producing)} = \frac{(1863 \text{ psi} - 1446 \text{ psi})}{7517 \text{ ft}} = 0.055 \frac{\text{psi}}{\text{ft}}$$

$$\text{Liquid Gradient (Producing)} = \frac{(2152 \text{ psi} - 1863 \text{ psi})}{(8153 \text{ ft} - 7517 \text{ ft})} = 0.454 \frac{\text{psi}}{\text{ft}}$$

Echo Meter Static 15 $\frac{1}{2}$ Hours Later (8/29/2018)

$$\text{Gas Gradient (Static)} = \frac{(1875 \text{ psi} - 1457 \text{ psi})}{7447 \text{ ft}} = 0.056 \frac{\text{psi}}{\text{ft}}$$

$$\text{Liquid Gradient (Static)} = \frac{(2053 \text{ psi} - 1875 \text{ psi})}{(8153 \text{ ft} - 7447 \text{ ft})} = 0.252 \frac{\text{psi}}{\text{ft}}$$

Per the Completion Report Dated 8/27/2018, API Gravity of the Condensate is 59 deg.

$$\text{Specific Gravity of Condensate} = \frac{(141.5)}{(131.5 + 59 \text{ deg.})} = 0.743$$

$$\text{Pressure Gradient of Condensate} = 0.743 \times 0.433 \frac{\text{psi}}{\text{ft}} = 0.322 \frac{\text{psi}}{\text{ft}}$$

Calculations for the Range of Initial Reservoir Pressures

From the Echo Meter Fluid Level on 8/29/18 & Liquid Gradient of 0.252 psi/ft:

$$\text{Using } 0.252 \frac{\text{psi}}{\text{ft}}, P_i = 1875 \text{ psi} + \left(0.252 \frac{\text{psi}}{\text{ft}}\right) \times (8153 \text{ ft} - 7447 \text{ ft}) = \mathbf{2053 \text{ psi SIBHP}}$$

From the Echo Meter Fluid Level on 8/29/18 & API Measured Gravity when Completed:

$$\text{Using } 0.322 \frac{\text{psi}}{\text{ft}}, P_i = 1875 \text{ psi} + \left(0.322 \frac{\text{psi}}{\text{ft}}\right) \times (8153 \text{ ft} - 7447 \text{ ft}) = \mathbf{2102 \text{ psi SIBHP}}$$

The Average Initial Reservoir Pressure is **2078 psi SIBHP**

Calculation of the FBHP using a Liquid Gradient of 0.252 psi/ft

$$\text{Using } 0.252 \frac{\text{psi}}{\text{ft}}, P_i = 1863 \text{ psi} + \left(0.252 \frac{\text{psi}}{\text{ft}}\right) \times (8153 \text{ ft} - 7517 \text{ ft}) = \mathbf{2023 \text{ psi FBHP}}$$

OLEUM OPERATING COMPANY, L.C.

EXHIBIT NO. E-7

DOCKET NO. 18-623

DATE: 12-4-18

WITNESS: Jim Veazey



D-O-R ENGINEERING, INC.