Initial Application Part I

Received: **07/16/2019**

This application is placed in file for record. It MAY or MAY NOT have been reviewed to be determined Administratively Complete

RECEIVED: 07/16/2019	REVIEWER:	TYPE: SWD	APP NO: pMAM1919739720

ABOVE THIS TABLE FOR OCD DIVISION USE ONLY

NEW MEXICO OIL CONSERVATION DIVISION
- Geological & Engineering Bureau –
1220 South St. Francis Drive, Santa Fe, NM 87505

ADMINISTRATIVE APPLICATION CHECKLIST

THIS CHECKLIST IS MANDATORY FOR ALL ADMINISTRATIVE APPLICATIONS FOR EXCEPTIONS TO DIVISION RULES AND REGULATIONS WHICH REQUIRE PROCESSING AT THE DIVISION LEVEL IN SANTA FE

Applicant: COG Operating, LLC **OGRID Number: 229137**
Well Name: Vamoose 6 Fee SWD #1 **API:**
Pool: **Pool Code:**

SUBMIT ACCURATE AND COMPLETE INFORMATION REQUIRED TO PROCESS THE TYPE OF APPLICATION INDICATED BELOW

SWD-2191

1) **TYPE OF APPLICATION:** Check those which apply for [A]
A. Location – Spacing Unit – Simultaneous Dedication
☐ NSL ☐ NSP (PROJECT AREA) ☐ NSP (PRORATION UNIT) ☐ SD

B. Check one only for [I] or [II]
[I] Commingling – Storage – Measurement
☐ DHC ☐ CTB ☐ PLC ☐ PC ☐ OLS ☐ OLM
[II] Injection – Disposal – Pressure Increase – Enhanced Oil Recovery
☐ WFX ☐ PMX ☒ SWD ☐ IPI ☐ EOR ☐ PPR

FOR OCD ONLY
☐ Notice Complete
☐ Application Content Complete

2) **NOTIFICATION REQUIRED TO:** Check those which apply.
A. ☒ Offset operators or lease holders
B. ☐ Royalty, overriding royalty owners, revenue owners
C. ☒ Application requires published notice
D. ☐ Notification and/or concurrent approval by SLO
E. ☐ Notification and/or concurrent approval by BLM
F. ☒ Surface owner
G. ☒ For all of the above, proof of notification or publication is attached, and/or,
H. ☐ No notice required

3) **CERTIFICATION:** I hereby certify that the information submitted with this application for administrative approval is **accurate** and **complete** to the best of my knowledge. I also understand that **no action** will be taken on this application until the required information and notifications are submitted to the Division.

Note: Statement must be completed by an individual with managerial and/or supervisory capacity.

Paul Porter
Print or Type Name

Signature

7-11-19
Date

575-748-6940
Phone Number

PPorter@concho.com
e-mail Address

STATE OF NEW MEXICO
ENERGY, MINERALS AND NATURAL
RESOURCES DEPARTMENT

Oil Conservation Division
1220 South St. Francis Dr.
Santa Fe, New Mexico 87505

FORM C-108
Revised June 10, 2003

APPLICATION FOR AUTHORIZATION TO INJECT

I. PURPOSE: _____Secondary Recovery _____Pressure Maintenance ____X___Disposal _____Storage
Application qualifies for administrative approval? ____X____Yes _____No

II. OPERATOR: COG Operating, LLC

ADDRESS: One Concho Center, 600 W. Illinois Ave., Midland, TX 79701

CONTACT PARTY: Paul Porter PHONE: 575-748-6940

III. WELL DATA: Complete the data required on the reverse side of this form for each well proposed for injection. Additional sheets may be attached if necessary.

IV. Is this an expansion of an existing project? _____Yes ____X____No
If yes, give the Division order number authorizing the project:

V. Attach a map that identifies all wells and leases within two miles of any proposed injection well with a one-half mile radius circle drawn around each proposed injection well. This circle identifies the well's area of review.

VI. Attach a tabulation of data on all wells of public record within the area of review which penetrate the proposed injection zone. Such data shall include a description of each well's type, construction, date drilled, location, depth, record of completion, and a schematic of any plugged well illustrating all plugging detail.

VII. Attach data on the proposed operation, including:

1. Proposed average and maximum daily rate and volume of fluids to be injected;
2. Whether the system is open or closed;
3. Proposed average and maximum injection pressure;
4. Sources and an appropriate analysis of injection fluid and compatibility with the receiving formation if other than reinjected produced water; and,
5. If injection is for disposal purposes into a zone not productive of oil or gas at or within one mile of the proposed well, attach a chemical analysis of the disposal zone formation water (may be measured or inferred from existing literature, studies, nearby wells, etc.).

*VIII. Attach appropriate geologic data on the injection zone including appropriate lithologic detail, geologic name, thickness, and depth. Give the geologic name, and depth to bottom of all underground sources of drinking water (aquifers containing waters with total dissolved solids concentrations of 10,000 mg/l or less) overlying the proposed injection zone as well as any such sources known to be immediately underlying the injection interval.

IX. Describe the proposed stimulation program, if any.

*X. Attach appropriate logging and test data on the well. (If well logs have been filed with the Division, they need not be resubmitted).

*XI. Attach a chemical analysis of fresh water from two or more fresh water wells (if available and producing) within one mile of any injection or disposal well showing location of wells and dates samples were taken.

XII. Applicants for disposal wells must make an affirmative statement that they have examined available geologic and engineering data and find no evidence of open faults or any other hydrologic connection between the disposal zone and any underground sources of drinking water.

XIII. Applicants must complete the "Proof of Notice" section on the reverse side of this form.

XIV. Certification: I hereby certify that the information submitted with this application is true and correct to the best of my knowledge and belief.

NAME: Paul Porter TITLE: General Manager of New Mexico

SIGNATURE: Paul Porter DATE: 7-11-19

E-MAIL ADDRESS: PPorter@concho.com

* If the information required under Sections VI, VIII, X, and XI above has been previously submitted, it need not be resubmitted. Please show the date and circumstances of the earlier submittal:

DISTRIBUTION: Original and one copy to Santa Fe with one copy to the appropriate District Office

III. WELL DATA

A. The following well data must be submitted for each injection well covered by this application. The data must be both in tabular and schematic form and shall include:

(1) Lease name; Well No.; Location by Section, Township and Range; and footage location within the section.

(2) Each casing string used with its size, setting depth, sacks of cement used, hole size, top of cement, and how such top was determined.

(3) A description of the tubing to be used including its size, lining material, and setting depth.

(4) The name, model, and setting depth of the packer used or a description of any other seal system or assembly used.

Division District Offices have supplies of Well Data Sheets which may be used or which may be used as models for this purpose. Applicants for several identical wells may submit a "typical data sheet" rather than submitting the data for each well.

B. The following must be submitted for each injection well covered by this application. All items must be addressed for the initial well. Responses for additional wells need be shown only when different. Information shown on schematics need not be repeated.

(1) The name of the injection formation and, if applicable, the field or pool name.

(2) The injection interval and whether it is perforated or open-hole.

(3) State if the well was drilled for injection or, if not, the original purpose of the well.

(4) Give the depths of any other perforated intervals and detail on the sacks of cement or bridge plugs used to seal off such perforations.

(5) Give the depth to and the name of the next higher and next lower oil or gas zone in the area of the well, if any.

XIV. PROOF OF NOTICE

All applicants must furnish proof that a copy of the application has been furnished, by certified or registered mail, to the owner of the surface of the land on which the well is to be located and to each leasehold operator within one-half mile of the well location.

Where an application is subject to administrative approval, a proof of publication must be submitted. Such proof shall consist of a copy of the legal advertisement which was published in the county in which the well is located. The contents of such advertisement must include:

(1) The name, address, phone number, and contact party for the applicant;

(2) The intended purpose of the injection well; with the exact location of single wells or the Section, Township, and Range location of multiple wells;

(3) The formation name and depth with expected maximum injection rates and pressures; and,

(4) A notation that interested parties must file objections or requests for hearing with the Oil Conservation Division, 1220 South St. Francis Dr., Santa Fe, New Mexico 87505, within 15 days.

NO ACTION WILL BE TAKEN ON THE APPLICATION UNTIL PROPER PROOF OF NOTICE HAS BEEN SUBMITTED.

NOTICE: Surface owners or offset operators must file any objections or requests for hearing of administrative applications within 15 days from the date this application was mailed to them.

C-108 Application for Authorization to Inject
Vamoose 6 Fee SWD 1
225' FNL, 2400' FWL
Unit C, Section 6, T24S, R35E
Lea County, NM

COG Operating, LLC, proposes to drill the captioned well to 17,200' for salt water disposal service into the Devonian/Silurian from approximately 15,400' to 17,200'.

Should this well undergo a mechanical integrity issue while in service in the future, it will be taken out of service immediately per UIC rules and repaired as quickly as possible. The water going to this well will be diverted to other SWD wells via pipeline if applicable; otherwise it will be trucked to other SWD wells. If necessary, producing wells serviced by this SWD well will be curtailed and/or shut-in until this well is repaired.

III. Well data is attached. A fishing risk assessment is attached.

IV. This is not an expansion of an existing project.

V. Map is attached.

VI. No wells within the 1 mile radius area of review penetrate the proposed injection zone.

VII. 1. Proposed average daily injection rate = 25,000 BWPD
Proposed maximum daily injection rate = 40,000 BWPD

2. Closed system

3. Proposed maximum injection pressure = 3080 psi
(0.2 psi/ft. x 15,400' ft.)

4. Source of injected water will be Delaware, Bone Spring and Wolfcamp produced water. No compatibility problems are expected. Analyses of Delaware, Bone Spring and Wolfcamp waters from analogous source wells are attached. An appropriate chemical treatment program will be put in place should scale formation become apparent.

VIII. The injection zone is the Devonian/Silurian, a mixture of non-hydrocarbon bearing limestone and dolomite from 15,400' to 17,200'. Any underground water sources will be shallower than 756', the estimated top of the Rustler Anhydrite. The estimated top of the Devonian is 15,601' and the Fusselman is 16,351'. The proposed permitted injection interval has been expanded upwards and downwards to account for geologic uncertainty.

IX. The Devonian/Silurian injection interval will be acidized with approximately 40,000 gals of 20 % HCl acid.

X. Well logs will be filed with the Division. A section of open hole log across the Devonian from the Custer Mountain Unit 1 located about 2.5 miles southeast in Unit K, Section 9, T24S, R35E is attached.

XI. There are no fresh water wells within a mile of the proposed SWD well from the NMOSE records.

XII. After examining the available geologic and engineering data, no evidence was found of open faults or any other hydrologic connection between the disposal zone and any underground sources of drinking water.

_____, Facilities Engineering Advisor, _____

A seismicity assessment is attached.

XIII. Proof of Notice is attached.

COG Operating LLC
Vamoose 6 Fee SWD #1
C-108 Attachment
May 23, 2019

Statement Regarding Seismicity and Disposal Well Location

COG Operating LLC interpreted faults based on licensed 3D seismic data in the area around our proposed SWD. Our investigation of the deep formations does not indicate nearby faults or structures in the immediate area that would increase the chances of induced seismicity.

A recent paper by Snee and Zoback titled, "State of Stress in the Permian Basin, Texas and New Mexico: Implications for induced seismicity", was published in the February 2018 edition of The Leading Edge. The authors evaluated the strike-slip probability of known Permian Basin faults. The nearest fault is located approximately 2.1 miles Southwest of our proposed SWD (see map). The study predicts that this fault has a less than 10% probability of being critically stressed as to create an induced seismicity event. The primary reason for the low probability is the relationship of the strike of the fault to the regional maximum stress orientation (N 75 degrees E).

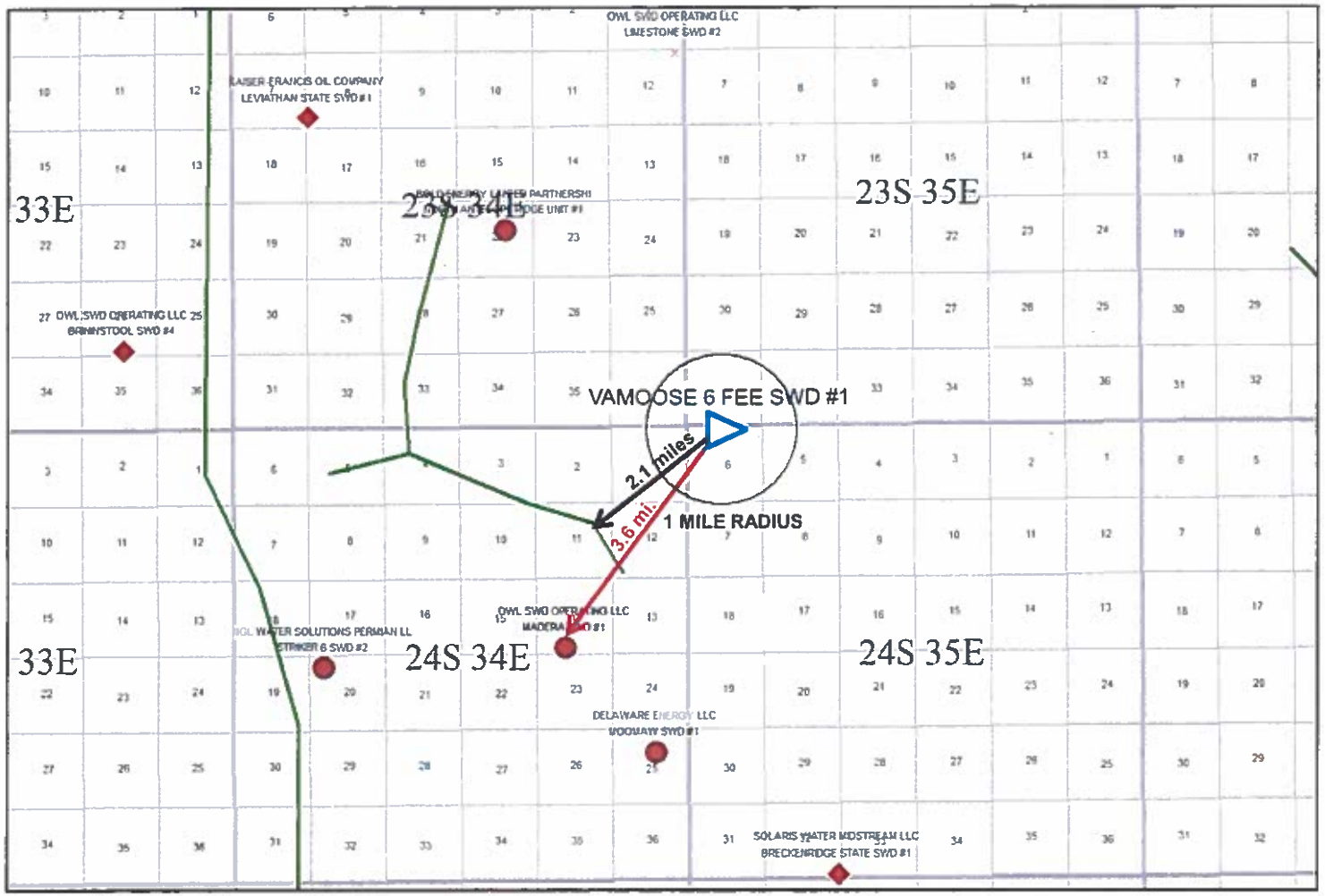
The proposed Vamoose 6 Fee SWD #1 is located 3.6 miles away from the nearest active Devonian SWD well (see map) and no active, permitted or pending Devonian SWD applications within the one mile radius.

Regards,

Carrie M. Martin

Staff Geologist
COG Operating LLC
cmartin@concho.com
432-221-0479

VAMOOSE 6 FEE SWD #1



LEGEND

Devonian SWD Status

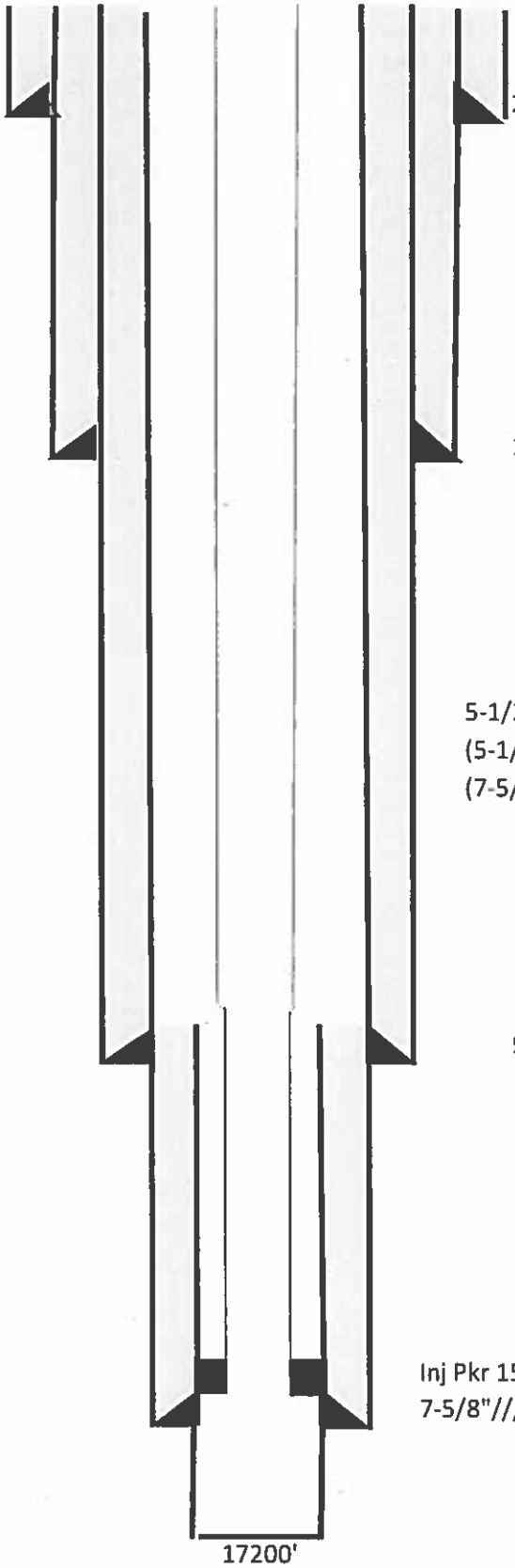
- SWD
- PLUGGED
- ABANDONED
- DRILLING
- LOC
- TA
- PROPOSED SWD
- Snee, Zoback Faults (Low Fault Slip Potential)

III.

WELL DATA

Vamoose 6 Fee SWD 1
225' FNL, 2400' FWL
C-6-24s-35e
Lea, NM
30-025-xxxxx

Zero:
KB elev:
GL elev: 3446'



26"

20"/// @ 775'

2325 CF Cmt (circ to surf)
Rustler top 756'

17.5"

13-3/8"/// @ 5325'

7325 CF Cmt (circ to surf)
Lamar Lm top 5236'

12.25"

5-1/2" x 5" Inj Tbg 0-15350'
(5-1/2" 0-11650' inside 9-5/8", 5" 11650-15350' inside 7-5/8")
(7-5/8" liner top 11750')

9-5/8"/// @ 11950'

5625 CF Cmt (circ to surf)
Wolfcamp top 11736'

8.5"

Inj Pkr 15350'
7-5/8"/// FJ liner 11750-15400'

425 CF Cmt (circ to liner top)
Set in top Devonian

6.5"

Devonian/Silurian OH

17200'

kbcollins 6-May-19

INJECTION WELL DATA SHEET

Operator: COG Operating, LLC
Well Name & Number: Vamoose 6 Fee SWD 1
Well Location: 225' FNL, 2400' FWL, Unit C, Section 8, T24S, R35E

Wellbore Schematic: See attached schematic

Surface Casing:

Hole Size: 26"
Casing Size: 20" @ 775'
Cemented with: 2325 cubic feet
Top of Cement: Surface by design

Intermediate Casing:

Hole Size: 17-1/2"
Casing Size: 13-3/8" @ 5325'
Cemented with: 7325 cubic feet
Top of Cement: Surface by design

Intermediate Casing:

Hole Size: 12-1/4"
Casing Size: 9-5/8" @ 11950'
Cemented with: 5625 cubic feet
Top of Cement: Surface by design

Production Casing:

Hole Size: 8-1/2"
Casing Size: 7-5/8" flush joint liner @ 11750-15400'
Cemented with: 425 cubic feet
Top of Cement: Liner top by design

Injection Interval:

15400' to 17200' (6-1/2" open hole)

Injection Tubing/Packer:

Tubing Size: 5-1/2" 0-11650' inside 9-5/8" casing, 5" from 11650-15350' inside 7-5/8" casing
Lining Material: Internally fiberglass lined
Type of Packer: Nickel plated or CRA 10K permanent packer
Packer Setting Depth: 15350'
Other Type of Tubing/Casing Seal: Not Applicable

Additional Data:

1. Is this a new well drilled for injection? Yes
   If no, for what purpose was well originally drilled? N/A

2. Name of Injection Formation: Devonian/Silurian

3. Name of Field or Pool (if applicable): SWD: Devonian

4. Has the well ever been perforated in any other zone(s)? List all such perforated intervals and give plugging detail, i.e., sacks of cement or plug(s) used. No

5. Give the name and depths of any oil or gas zones underlying or overlying the proposed injection zone in this area:

   Overlying: Possible Delaware 5250-8800', Bone Spring 8800-11825', Wolfcamp 11825-12100', possible Strawn 12150'+, possible Atoka 12425'+, possible Morrow 13350'+

   Underlying: None

Fishing Risk Assessment
Vamoose 6 Fee SWD 1

Note: All fishing procedures are subject to well conditions. Expert judgement and experience are required and there are too many combinations of possible fishing operations options to list below. Fishing techniques are determined on a case-by-case, day-by-day basis.

5" Injection Tubing Inside of 7-5/8" Casing

7-5/8"/39ppf casing: ID = 6.625", Drift ID = 6.500"
5"/18ppf/L80/TCPC FG-lined injection tubing: Tube/body OD = 5.000", Cplg OD = 5.700"
Clearance between body OD of tubing and drift ID of casing = 1.500"

The proposed downhole configuration allows for effective, straightforward tubing fishing operations.

Tubing will have a floating seal assembly landed in seal bore extensions below the packer which will allow a simple straight pull to separate the tubing from the packer.

For washover operations:

- 6-3/8" washpipe: OD = 6.375", ID = 5.625", Drift ID = 5.500"
- OD of washpipe is less than drift ID of casing (6.500" drift ID vs 6.375" washpipe OD)
- Drift ID of washpipe is greater than OD of 5" tubing (5.500" drift ID vs 5.000" Tubing OD)
- Drift ID of washpipe is slightly less than coupling OD of 5" tubing (washpipe 5.500" drift ID vs 5.700" tubing coupling OD---0.200" difference). If necessary to wash over the coupling, would use a mill on the end of the washpipe to mill off the 0.200" dimensional difference in such a way:

    1. To allow a 6.625" Series 150 spiral grapple overshot turned down from 6.625" OD to 6.5" OD to catch the milled down coupling (mill coupling to 5.5" or less OD).
    2. To allow a 5.875" OD Series 150 spiral grapple overshot to catch the 5" body of the tubing (mill coupling to 5" tube OD).

For fishing operations with overshot:

- 5" tube/body can be fished with 5.875" OD Series 150 spiral grapple overshot (5.875" overshot OD vs 6.5" casing drift ID).
- 5.700" OD TCPC coupling can be milled down and fished as described above in "washover operations."

For fishing operations with spear:

- Fiberglass liner can be milled out, or torn out with a spear, to allow a releasable spear assembly to grasp the ID of the injection tubing.

Fishing Risk Assessment
Vamoose 6 Fee SWD 1

Note: All fishing procedures are subject to well conditions. Expert judgement and experience are required and there are too many combinations of possible fishing operations options to list below. Fishing techniques are determined on a case-by-case, day-by-day basis.

5-1/2" Injection Tubing Inside of 9-5/8" Casing

9-5/8"/53.5 ppf casing: ID = 8.535", Drift ID = 8.379"
5-1/2"/20ppf/P110/TCPC FG-lined injection tubing: Tube/body OD = 5.500", Cplg OD = 6.250"
Clearance between body OD of tubing and drift ID of casing = 2.879"

The proposed downhole configuration allows for effective, straightforward tubing fishing operations.

Tubing will have a floating seal assembly landed in seal bore extensions below the packer which will allow a simple straight pull to separate the tubing from the packer.

For washover operations:

- 7-3/8" washpipe: OD = 7.375", ID = 6.625", Drift ID = 6.500"
- OD of washpipe is less than drift ID of casing (8.379" drift ID vs 7.375" washpipe OD)
- Drift ID of washpipe is greater than OD of 5-1/2" tubing (6.500" drift ID vs 5.500" Tubing OD)
- Drift ID of washpipe greater than OD of 5-1/2" tubing coupling (6.500" drift ID vs 6.250" Tubing Coupling OD)

For fishing operations with overshot:

- 5-1/2" tube/body can be fished with 6.625" OD Series 150 spiral grapple overshot (6.625" overshot OD vs 8.379" casing drift ID).
- 6.250" OD TCPC coupling can be fished with 7.375" OD Series 150 spiral grapple overshot (7.375" overshot OD vs 8.379" casing drift ID).

For fishing operations with spear:

- Fiberglass liner can be milled out, or torn out with a spear, to allow a releasable spear assembly to grasp the ID of the injection tubing.

V.

MAP

District I
1625 N. French Dr., Hobbs, NM 88240
Phone: (575) 393-6161 Fax: (575) 393-0720
District II
811 S. First St., Artesia, NM 88210
Phone: (575) 748-1283 Fax: (575) 748-9720
District III
1000 Rio Brazos Road, Aztec, NM 87410
Phone: (505) 334-6178 Fax: (505) 334-6170
District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505
Phone: (505) 476-3460 Fax: (505) 476-3462

State of New Mexico
Energy, Minerals & Natural Resources Department
OIL CONSERVATION DIVISION
1220 South St. Francis Dr.
Santa Fe, NM 87505

Form C-102
Revised August 1, 2011
Submit one copy to appropriate District Office

☐ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

1 API Number	2 Pool Code	3 Pool Name

4 Property Code	5 Property Name	6 Well Number
	VAMOOSE 6 FEE SWD	1
7 OGRID No.	8 Operator Name	9 Elevation
	COG OPERATING, LLC	3446'

10 Surface Location

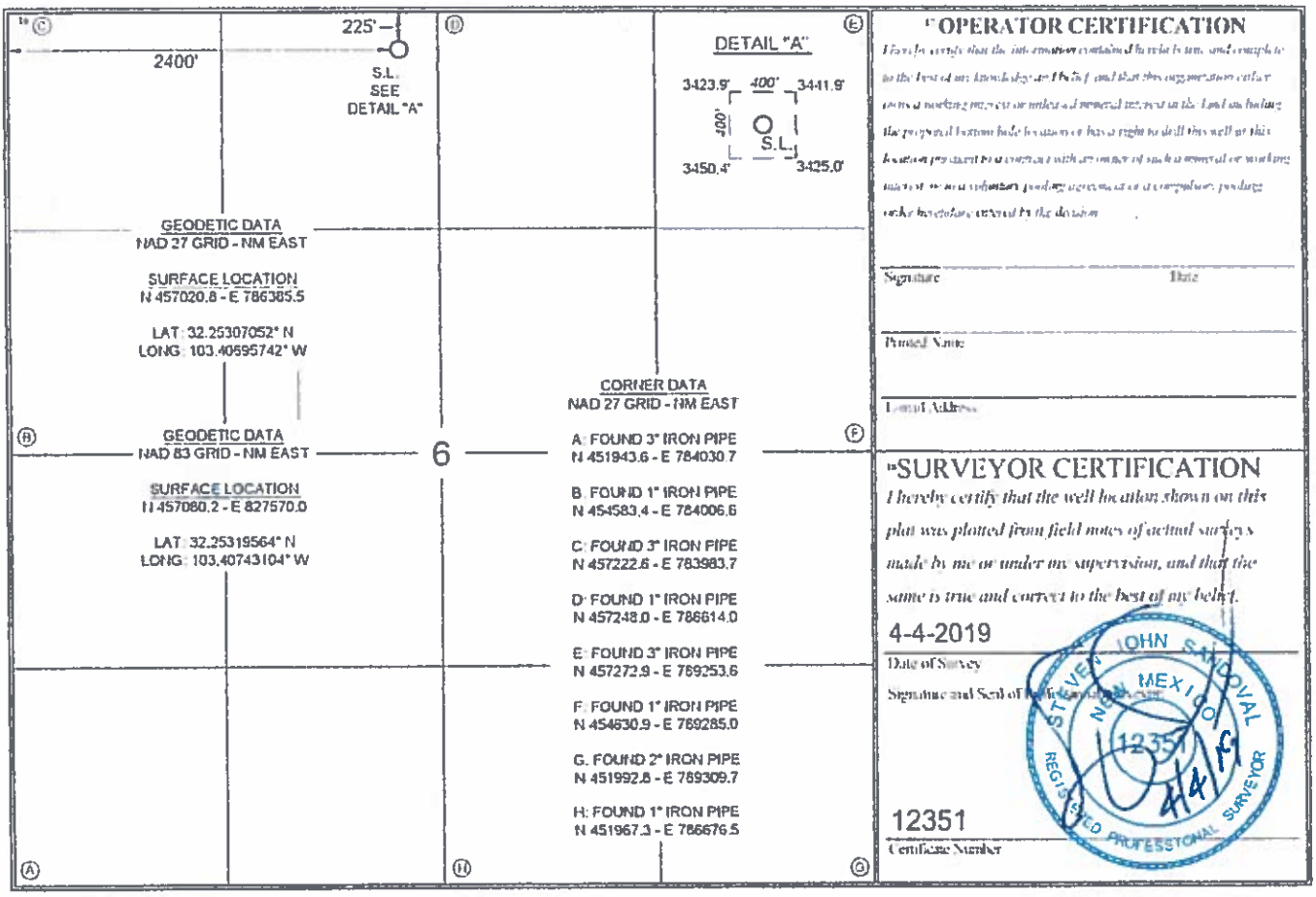
UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
C	6	24S	35E		225	NORTH	2400	WEST	LEA

11 Bottom Hole Location If Different From Surface

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County

12 Dedicated Acres	13 Joint or Infill	14 Consolidation Code	15 Order No.

No allowable will be assigned to this completion until all interests have been consolidated or a non-standard unit has been approved by the division.



17 OPERATOR CERTIFICATION

I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief, and that this organization either owns a working interest or unleased mineral interest in the land including the proposed bottom hole location or has a right to drill this well at this location pursuant to a contract with an owner of such a mineral or working interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division.

Signature Date

Printed Name

Email Address

18 SURVEYOR CERTIFICATION

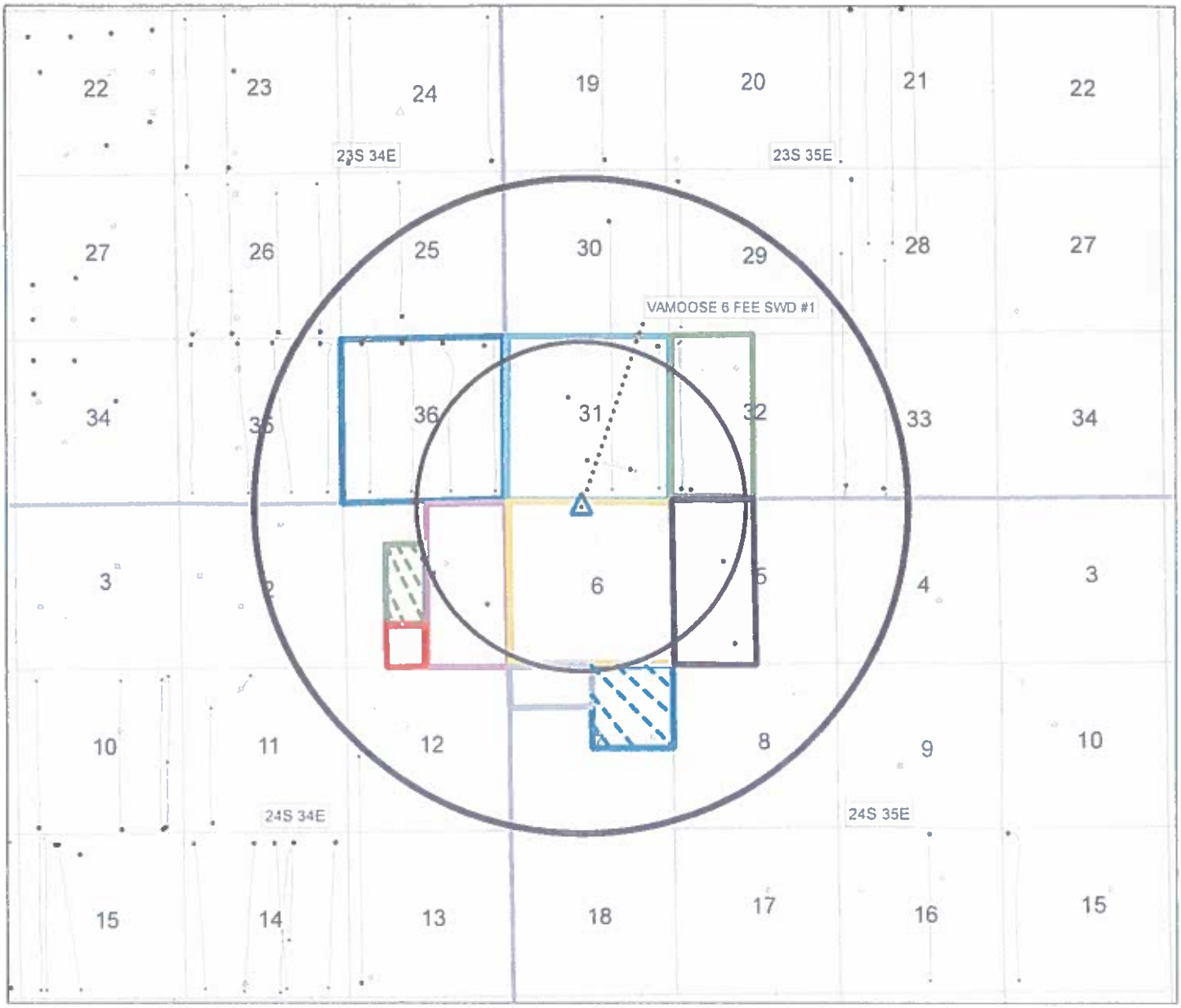
I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my belief.

4-4-2019
Date of Survey

Signature and Seal of Professional Surveyor

STEVEN JOHN SANDOVAL
NEW MEXICO
12351
REGISTERED PROFESSIONAL SURVEYOR

12351
Certificate Number



CO

Project: NDB

NORTHERN DELAWARE BASIN TEAM

VAMOOSE 6 FEE SWD 1

225 FNL 2400 FWL
SEC 6-24S-35E
LEA, NM

Author:		Date:
KSTEVENS		10 July, 2019

File Path: North Delaware Basin\NDB SWD AOI\VAMOOSE 6 FEE SWD 1

- Mewbourne Oil Company & State of New Mexico Commissioner of Public Lands
- Devon Energy Production Company LP & State of New Mexico Commissioner of Public Lands
- Matador Production Company & State of New Mexico Commissioner of Public Lands
- OXY USA Inc. & United States of America, through the Bureau of Land Management
- Tap Rock Resources LLC, Delaware Hops LLC, Energen Resources Corporation, Chevron USA Inc, Marathon Oil Permian Inc, David H Arrington & United States of America, through the Bureau of Land Management
- Oxy USA Inc & United States of America, through the Bureau of Land Management
- Oxy USA Inc & United States of America, through the Bureau of Land Management
- Oxy USA Inc & United States of America, through the Bureau of Land Management
- Oxy USA Inc & PXP Producing Co LLC
- OXY USA INC & United States of America, through the Bureau of Land Management

Vamoose 6 Fee SWD #1

located in 6-24S-35E, Lea County, New Mexico

Affected Persons

Name	Address	Phone Number	Owner Type	S-T-R	Notes
COG Operating, LLC	One Concho Center 600 West Illinois Avenue Midland, TX 79701	432-221-0500	Operator	1-24S-34E 6-24S-35E	APIs: 30-025-43283 30-025-44725
OXY USA Inc.	P.O. Box 4294 Houston, TX 77210	713-366-5716	Operator	1-24S-34E 5-24S-35E 7-24S-35E	APIs: 30-025-31920 30-025-37538 30-025-33129
PXP Producing Co LLC	717 Texas Street Suite 2100 Houston, TX 77002	713-579-6000	Operator	7-24S-35E	See Title Note 1 for NE4 7-24S-35E
Mewbourne Oil Company	P.O. Box 7698 Tyler, TX 75711	903-561-1045	Operator	36-23S-34E	APIs: 30-025-42436 30-025-43885 30-025-42446 30-025-43929
Matador Production Company	One Lincoln Centre 5400 LBJ Freeway, Suite 1500 Dallas, TX 75240	972-371-5200	Operator	32-23S-35E	APIs: 30-025-40670 30-025-44659
Devon Energy Production Company, LP	333 West Sheridan Ave Oklahoma City, OK 73102	405-552-4660	Operator	31-23S-35E	APIs: 30-025-36798 30-025-37069 30-025-37620 30-025-40428 30-025-41864
OXY USA Inc.	P.O. Box 4294 Houston, TX 77210	713-366-5716	Working Interest	1-24S-34E 6-24S-35E 7-24S-35E	
Tap Rock Resources, LLC	602 Park Point Drive Suite 200 Golden, CO 80401	720-772-5090	Working Interest	1-24S-34E	
Delaware Hops, LLC	50 Kennedy Plaza 18th Floor Providence, RI 02903	401-751-1700	Working Interest	1-24S-34E	
Energen Resources Corporation	3510 N A Street Midland, TX 79705	432-687-1155	Working Interest	1-24S-34E	

Chevron USA, Inc.	15 Smith Road Midland, Texas 79705	432-498-8600	Working Interest	1-24S-34E	
Marathon Oil Permian, LLC	5555 San Felipe Houston, TX 77056	713-629-6600	Working Interest	1-24S-34E	
David H. Arrington	500 W. Wall Street Suite 300 Midland, TX 79701	432-682-6685	Working Interest	1-24S-34E	
United States of America, through the Bureau of Land Management	New Mexico State Office 301 Dinosaur Trail Santa Fe, NM 87508	505-954-2000 blm_nm_comments @blm.gov	Mineral	1-24S-34E 5-24S-35E 6-24S-35E 7-24S-35E	
State of New Mexico Commissioner of Public Lands	310 Old Santa Fe Trail Santa Fe, NM 87501	505-827-5760	Mineral	36-23S-34E 32-23-35E	

VI.

No Wells Penetrate Proposed Disposal Interval Within One Mile Area of Review

VII.

Water Analysis Produced and Receiving Formation Water

Delaware Sand

BAKER HUGHES

Permian Basin Area Laboratory
2101 Market Street,
Midland, Texas 79703

Upstream Chemicals

REPORT DATE: 5/11/2018

COMPLETE WATER ANALYSIS REPORT SSP v.2010

CUSTOMER:	COG OPERATING LLC	ACCOUNT REP:	KENNETH MORGAN
DISTRICT:	NEW MEXICO	SAMPLE ID:	201701012804
AREA/LEASE:	KING TUT	SAMPLE DATE:	3/21/2017
SAMPLE POINT NAME	KING TUT FED 3H BTRY	ANALYSIS DATE:	3/24/2017
SITE TYPE:	FACILITY	ANALYST:	SVP
SAMPLE POINT DESCRIPTION:	TRANSFER PUMP		

COG OPERATING LLC, KING TUT, KING TUT FED 3H BTRY

FIELD DATA

Initial Temperature (°F):	250
Final Temperature (°F):	80
Initial Pressure (psi):	100
Final Pressure (psi):	15
pH:	
pH at time of sampling:	6.8

ALKALINITY BY TITRATION:	mg/L	meq/L
Bicarbonate (HCO_3^-):	36.6	0.6
Carbonate (CO_3^{2-}):	ND	
Hydroxide (OH^-):	ND	

aqueous CO_2 (ppm):	1050.0
aqueous H_2S (ppm):	0.0
aqueous O2 (ppb):	ND
Calculated TDS (mg/L):	247582
Density/Specific Gravity (g/cm³):	1.1573
Measured Specific Gravity	1.1683
Conductivity (mmhos):	ND
Resistivity:	ND
MCF/D:	No Data
BOPD:	No Data
BWPD:	No Data

ANALYSIS OF SAMPLE

ANIONS:	mg/L	meq/L
Chloride (Cl^-):	152606.2	4304.8
Sulfate (SO_4^{2-}):	461.4	9.6
Borate (H_3BO_3):	170.9	2.8
Fluoride (F^-):	ND	
Bromide (Br^-):	ND	
Nitrite (NO_2^-):	ND	
Nitrate (NO_3^-):	ND	
Phosphate (PO_4^{3-}):	ND	
Silica (SiO_2):	ND	

ORGANIC ACIDS:	mg/L	meq/L
Formic Acid:	ND	
Acetic Acid:	ND	
Propionic Acid:	ND	
Butyric Acid:	ND	
Valeric Acid:	ND	

CATIONS:	mg/L	meq/L
Sodium (Na^+):	74498.5	3241.9
Potassium (K^+):	1381.8	35.3
Magnesium (Mg^{2+}):	2495.8	205.4
Calcium (Ca^{2+}):	15329.6	765.0
Strontium (Sr^{2+}):	724.2	16.5
Barium (Ba^{2+}):	1.8	0.0
Iron (Fe^{2+}):	43.2	1.5
Manganese (Mn^{2+}):	2.6	0.1
Lead (Pb^{2+}):	0.0	0.0
Zinc (Zn^{2+}):	0.0	0.0
Aluminum (Al^{3+}):	0.0	0.0
Chromium (Cr^{3+}):	ND	
Cobalt (Co^{2+}):	ND	
Copper (Cu^{2+}):	0.0	0.0
Molybdenum (Mo^{2+}):	0.0	0.0
Nickel (Ni^{2+}):	ND	
Tin (Sn^{2+}):	ND	
Titanium (Ti^{3+}):	ND	
Vanadium (V^{2+}):	ND	
Zirconium (Zr^{2+}):	ND	
Lithium (Li^+):	ND	
Total Hardness:	49434	N/A

Anion/Cation Ratio: 1.01

ND = Not Determined

SCALE PREDICTIONS BASED ON FIELD PROVIDED DATA. FUTHER MODELING MAY BE REQUIRED FOR VALIDATION OF SCALE PREDICTION RESULTS

Conditions		Barite ($BaSO_4$)		Calcite ($CaCO_3$)		Gypsum ($CaSO_4 \cdot 2H_2O$)		Anhydrite ($CaSO_4$)	
Temp	Press.	Index	Amt (ptb)	Index	Amt (ptb)	Index	Amt (ptb)	Index	Amt (ptb)
80°F	15 psi	0.40	0.646	1.16	7.579	-0.15	0.000	-0.23	0.000
99°F	24 psi	0.28	0.509	1.18	7.675	-0.14	0.000	-0.14	0.000
118°F	34 psi	0.16	0.334	1.20	7.774	-0.14	0.000	-0.06	0.000
137°F	43 psi	0.05	0.115	1.22	7.857	-0.15	0.000	0.03	13.651
156°F	53 psi	-0.06	0.000	1.23	7.925	-0.15	0.000	0.11	51.143
174°F	62 psi	-0.16	0.000	1.24	7.980	-0.16	0.000	0.20	82.865
193°F	72 psi	-0.25	0.000	1.25	8.022	-0.17	0.000	0.28	109.409
212°F	81 psi	-0.34	0.000	1.25	8.058	-0.19	0.000	0.37	131.297
231°F	91 psi	-0.42	0.000	1.26	8.083	-0.20	0.000	0.46	149.069
250°F	100 psi	-0.50	0.000	1.26	8.095	-0.22	0.000	0.55	163.281

Conditions		Celestite ($SrSO_4$)		Halite (NaCl)		Iron Sulfide (FeS)		Iron Carbonate ($FeCO_3$)	
Temp	Press.	Index	Amt (ptb)	Index	Amt (ptb)	Index	Amt (ptb)	Index	Amt (ptb)
80°F	15 psi	0.34	123.094	-0.45	0.000	-7.90	0.000	0.19	1.935
99°F	24 psi	0.34	125.716	-0.46	0.000	-8.04	0.000	0.27	2.698
118°F	34 psi	0.35	126.379	-0.48	0.000	-8.15	0.000	0.34	3.330
137°F	43 psi	0.35	126.223	-0.49	0.000	-8.24	0.000	0.39	3.801
156°F	53 psi	0.35	126.022	-0.50	0.000	-8.32	0.000	0.43	4.122
174°F	62 psi	0.35	126.264	-0.51	0.000	-8.38	0.000	0.45	4.307
193°F	72 psi	0.35	127.203	-0.53	0.000	-8.43	0.000	0.45	4.367
212°F	81 psi	0.36	128.885	-0.54	0.000	-8.47	0.000	0.44	4.316
231°F	91 psi	0.36	131.186	-0.55	0.000	-8.51	0.000	0.42	4.148
250°F	100 psi	0.37	133.846	-0.56	0.000	-8.54	0.000	0.38	3.848

Note 1: When assessing the severity of the scale problem, both the saturation index (SI) and amount of scale must be considered.

Note 2: Precipitation of each scale is considered separately. Total scale will be less than the sum of the amounts of the eight (8) scales.

Note 3: Saturation index predictions on this sheet use pH and alkalinity. H_2CO_3 is not included in the calculations.

ScaleSoftPitzer™ SSP2010

Comments

Bone Spring

BAKER HUGHES

Permian Basin Area Laboratory
2101 Market Street
Midland, Texas 79703

Upstream Chemicals

REPORT DATE: 5/16/2018

COMPLETE WATER ANALYSIS REPORT SSP v.2010

CUSTOMER:	COG OPERATING LLC	ACCOUNT REP:	KENNETH MORGAN
DISTRICT:	NEW MEXICO	SAMPLE ID:	201501048297
AREA/LEASE:	WINDWARD	SAMPLE DATE:	12/11/2015
SAMPLE POINT NAME	WINDWARD FED 2H	ANALYSIS DATE:	12/16/2015
SITE TYPE:	WELL SITES	ANALYST:	SAMUEL NEWMAN
SAMPLE POINT DESCRIPTION:	WELL HEAD		

COG OPERATING LLC, WINDWARD, WINDWARD FED 2H

FIELD DATA

Initial Temperature (°F):	250
Final Temperature (°F):	82
Initial Pressure (psi):	100
Final Pressure (psi):	15
pH:	
pH at time of sampling:	7.1

ALKALINITY BY TITRATION:	mg/L	meq/L
Bicarbonate (HCO_3^-):	170.0	2.8
Carbonate (CO_3^{2-}):	ND	
Hydroxide (OH):	ND	

aqueous CO_2 (ppm):	240.0
aqueous H_2S (ppm):	0.0
aqueous O2 (ppb):	ND
Calculated TDS (mg/L):	146283
Density/Specific Gravity (g/cm³):	1.0934
Measured Specific Gravity	1.1045
Conductivity (mmhos):	ND
Resistivity:	ND
MCF/D:	No Data
BOPD:	No Data
BWPD:	No Data

ANALYSIS OF SAMPLE

ANIONS:	mg/L	meq/L
Chloride (Cl^-):	89914.5	2536.4
Sulfate (SO_4^{2-}):	1031.7	21.5
Borate (H_3BO_3):	187.2	3.0
Fluoride (F^-):	ND	
Bromide (Br^-):	ND	
Nitrite (NO_2^-):	ND	
Nitrate (NO_3^-):	ND	
Phosphate (PO_4^{3-}):	ND	
Silica (SiO_2):	ND	

ORGANIC ACIDS:	mg/L	meq/L
Formic Acid:	ND	
Acetic Acid:	ND	
Propionic Acid:	ND	
Butyric Acid:	ND	
Valeric Acid:	ND	

CATIONS:	mg/L	meq/L
Sodium (Na^+):	46148.7	2008.2
Potassium (K^+):	902.9	23.1
Magnesium (Mg^{2+}):	855.0	70.4
Calcium (Ca^{2+}):	6890.6	343.8
Strontium (Sr^{2+}):	278.9	6.4
Barium (Ba^{2+}):	0.0	0.0
Iron (Fe^{2+}):	89.1	3.2
Manganese (Mn^{2+}):	1.8	0.1
Lead (Pb^{2+}):	ND	
Zinc (Zn^{2+}):	0.0	0.0
Aluminum (Al^{3+}):	ND	
Chromium (Cr^{3+}):	ND	
Cobalt (Co^{2+}):	ND	
Copper (Cu^{2+}):	ND	
Molybdenum (Mo^{2+}):	ND	
Nickel (Ni^{2+}):	ND	
Tin (Sn^{2+}):	ND	
Titanium (Ti^{2+}):	ND	
Vanadium (V^{2+}):	ND	
Zirconium (Zr^{2+}):	ND	
Lithium (Li^+):	ND	
Total Hardness:	21067	N/A

Anion/Cation Ratio: 1.04

ND = Not Determined

SCALE PREDICTIONS BASED ON FIELD PROVIDED DATA, FUTHER MODELING MAY BE REQUIRED FOR VALIDATION OF SCALE PREDICTION RESULTS

Conditions		Barite ($BaSO_4$)		Calcite ($CaCO_3$)		Gypsum ($CaSO_4 \cdot 2H_2O$)		Anhydrite ($CaSO_4$)	
Temp	Press	Index	Amt (ptb)	Index	Amt (ptb)	Index	Amt (ptb)	Index	Amt (ptb)
82°F	15 psi		0.000	1.43	35.518	-0.18	0.000	-0.34	0.000
101°F	24 psi		0.000	1.48	36.271	-0.17	0.000	-0.25	0.000
119°F	34 psi		0.000	1.54	37.269	-0.16	0.000	-0.16	0.000
138°F	43 psi		0.000	1.60	38.261	-0.15	0.000	-0.06	0.000
157°F	53 psi		0.000	1.66	39.182	-0.15	0.000	0.04	39.216
175°F	62 psi		0.000	1.72	40.019	-0.14	0.000	0.14	133.848
194°F	72 psi		0.000	1.78	40.776	-0.13	0.000	0.24	211.707
213°F	81 psi		0.000	1.84	41.510	-0.13	0.000	0.35	274.678
231°F	91 psi		0.000	1.90	42.195	-0.13	0.000	0.45	324.816
250°F	100 psi		0.000	1.96	42.808	-0.12	0.000	0.56	364.191

Conditions		Celestite ($SrSO_4$)		Halite (NaCl)		Iron Sulfide (FeS)		Iron Carbonate ($FeCO_3$)	
Temp	Press.	Index	Amt (ptb)	Index	Amt (ptb)	Index	Amt (ptb)	Index	Amt (ptb)
82°F	15 psi	0.16	51.545	-1.13	0.000	-7.50	0.000	1.19	30.476
101°F	24 psi	0.17	54.187	-1.14	0.000	-7.61	0.000	1.28	32.451
119°F	34 psi	0.18	56.250	-1.15	0.000	-7.69	0.000	1.38	34.487
138°F	43 psi	0.18	58.374	-1.16	0.000	-7.75	0.000	1.47	36.277
157°F	53 psi	0.19	60.980	-1.17	0.000	-7.79	0.000	1.55	37.770
175°F	62 psi	0.21	64.301	-1.17	0.000	-7.81	0.000	1.61	38.985
194°F	72 psi	0.22	68.407	-1.18	0.000	-7.83	0.000	1.66	39.950
213°F	81 psi	0.24	73.238	-1.18	0.000	-7.84	0.000	1.70	40.777
231°F	91 psi	0.26	78.634	-1.18	0.000	-7.83	0.000	1.73	41.446
250°F	100 psi	0.29	84.362	-1.18	0.000	-7.82	0.000	1.75	41.931

Note 1: When assessing the severity of the scale problem, both the saturation index (SI) and amount of scale must be considered.

Note 2: Precipitation of each scale is considered separately. Total scale will be less than the sum of the amounts of the eight (8) scales.

Note 3: Saturation index predictions on this sheet use pH and alkalinity. $^*CO_2$ is not included in the calculations.

EES ScaleSoftPitzer™ SSP2010

Comments:

Wolfcamp

BAKER HUGHES

Permian Basin Area Laboratory
2101 Market Street,
Midland, Texas 79703

Upstream Chemicals

REPORT DATE: 5/11/2018

COMPLETE WATER ANALYSIS REPORT SSP v.2010

CUSTOMER:	COG OPERATING LLC	ACCOUNT REP:	LARRY G HINES
DISTRICT:	WATER MANAGEMENT - PERMIAN	SAMPLE ID:	201801021234
AREA/LEASE:	VIKING HELMET STATE	SAMPLE DATE:	4/11/2018
SAMPLE POINT NAME	VIKING HELMET STATE COM 24H	ANALYSIS DATE:	4/16/2018
SITE TYPE:	WELL SITES	ANALYST:	SP
SAMPLE POINT DESCRIPTION:	WELL HEAD		

COG OPERATING LLC, VIKING HELMET STATE, VIKING HELMET STATE COM 24H

FIELD DATA		ANALYSIS OF SAMPLE					
		ANIONS:	mg/L	meq/L	CATIONS:	mg/L	meq/L
Initial Temperature (°F):	250	Chloride (Cl^-):	80548.2	2272.2	Sodium (Na^+):	46716.0	2032.9
Final Temperature (°F):	88	Sulfate (SO_4^{2-}):	1551.7	32.3	Potassium (K^+):	887.5	22.7
Initial Pressure (psi):	100	Borate (H_3BO_3):	170.8	2.8	Magnesium (Mg^{2+}):	684.8	56.4
Final Pressure (psi):	15	Fluoride (F^-):	ND		Calcium (Ca^{2+}):	5224.8	260.7
		Bromide (Br^-):	ND		Strontium (Sr^{2+}):	209.4	4.8
pH:		Nitrite (NO_2^-):	ND		Barium (Ba^{2+}):	0.0	0.0
pH at time of sampling:	6.8	Nitrate (NO_3^-):	ND		Iron (Fe^{2+}):	126.5	4.5
		Phosphate (PO_4^{3-}):	ND		Manganese (Mn^{2+}):	3.4	0.1
		Silica (SiO_2):	ND		Lead (Pb^{2+}):	0.0	0.0
					Zinc (Zn^{2+}):	0.0	0.0
ALKALINITY BY TITRATION:	mg/L	meq/L					
Bicarbonate (HCO_3^-):	342.0	5.6			Aluminum (Al^{3+}):	0.0	0.0
Carbonate (CO_3^{2-}):	ND				Chromium (Cr^{3+}):	ND	
Hydroxide (OH^-):	ND				Cobalt (Co^{2+}):	ND	
		ORGANIC ACIDS:	mg/L	meq/L	Copper (Cu^{2+}):	0.0	0.0
aqueous CO_2 (ppm):	220.0	Formic Acid:	ND		Molybdenum (Mo^{2+}):	0.0	0.0
aqueous H_2S (ppm):	0.0	Acetic Acid:	ND		Nickel (Ni^{2+}):	ND	
aqueous O2 (ppb):	ND	Propionic Acid:	ND		Tin (Sn^{2+}):	ND	
		Butyric Acid:	ND		Titanium (Ti^{3+}):	ND	
Calculated TDS (mg/L):	136294	Valeric Acid:	ND		Vanadium (V^{2+}):	ND	
Density/Specific Gravity (g/cm³):	1.0879				Zirconium (Zr^{2+}):	ND	
Measured Specific Gravity	1.0961				Lithium (Li^+):	ND	
Conductivity (mmhos):	ND						
Resistivity:	ND				Total Hardness:	16122	N/A
MCF/D:	No Data						
BOPD:	No Data						
BWPD:	No Data	Anion/Cation Ratio:		0.97	ND = Not Determined		

SCALE PREDICTIONS BASED ON FIELD PROVIDED DATA. FUTHER MODELING MAY BE REQUIRED FOR VALIDATION OF SCALE PREDICTION RESULTS

Conditions		Barite ($BaSO_4$)		Calcite ($CaCO_3$)		Gypsum ($CaSO_4 \cdot 2H_2O$)		Anhydrite ($CaSO_4$)	
Temp	Press.	Index	Amt (ptb)	Index	Amt (ptb)	Index	Amt (ptb)	Index	Amt (ptb)
88°F	15 psi		0.000	1.26	69.277	-0.13	0.000	-0.27	0.000
106°F	24 psi		0.000	1.31	70.705	-0.12	0.000	-0.18	0.000
124°F	34 psi		0.000	1.38	72.857	-0.11	0.000	-0.09	0.000
142°F	43 psi		0.000	1.45	75.061	-0.10	0.000	0.00	4.176
160°F	53 psi		0.000	1.54	77.135	-0.10	0.000	0.10	142.433
178°F	62 psi		0.000	1.62	79.035	-0.09	0.000	0.20	260.388
196°F	72 psi		0.000	1.70	80.758	-0.06	0.000	0.30	359.322
214°F	81 psi		0.000	1.78	82.441	-0.08	0.000	0.40	440.907
232°F	91 psi		0.000	1.87	84.028	-0.07	0.000	0.50	507.127
250°F	100 psi		0.000	1.95	85.448	-0.07	0.000	0.61	560.114

Conditions		Celestite ($SrSO_4$)		Halite (NaCl)		Iron Sulfide (FeS)		Iron Carbonate ($FeCO_3$)	
Temp	Press.	Index	Amt (ptb)	Index	Amt (ptb)	Index	Amt (ptb)	Index	Amt (ptb)
88°F	15 psi	0.19	50.203	-1.20	0.000	-7.79	0.000	1.31	61.325
106°F	24 psi	0.20	52.071	-1.21	0.000	-7.88	0.000	1.40	64.099
124°F	34 psi	0.21	53.663	-1.22	0.000	-7.92	0.000	1.51	67.134
142°F	43 psi	0.22	55.383	-1.22	0.000	-7.94	0.000	1.61	69.838
160°F	53 psi	0.23	57.491	-1.23	0.000	-7.95	0.000	1.71	72.110
178°F	62 psi	0.24	60.125	-1.23	0.000	-7.94	0.000	1.79	73.969
196°F	72 psi	0.26	63.318	-1.24	0.000	-7.93	0.000	1.85	75.466
214°F	81 psi	0.28	67.017	-1.24	0.000	-7.91	0.000	1.91	76.785
232°F	91 psi	0.30	71.103	-1.24	0.000	-7.88	0.000	1.97	77.898
250°F	100 psi	0.33	75.415	-1.24	0.000	-7.84	0.000	2.01	78.761

Note 1: When assessing the severity of the scale problem, both the saturation index (SI) and amount of scale must be considered.
Note 2: Precipitation of each scale is considered separately. Total scale will be less than the sum of the amounts of the eight (8) scales.
Note 3: Saturation index predictions on this sheet use pH and alkalinity. HCO_3 is not included in the calculations.

ScaleSoftPitzer™ SSP2010

Comments:

Devonian (Receiving Formation)
Sec 19-19s-32e

8.0 RESERVOIR CHARACTERISTICS

8.1 FORMATION FLUID CHEMISTRY

Following the drilling of the 6-inch open-hole section the injection zone was swabbed and 10 samples were sent to Cardinal Laboratories in Hobbs, NM. The laboratory report and analysis, along with a summary table of the results that depict the concentrations of all analytes is included in Appendix D. The average concentrations for major constituents within the formation water in the entire injection interval are as follows:

Chloride: 23,700 mg/L
TDS: 42,750 mg/L
Diesel Range Organics: 5.7 mg/L
Extended Range Organics: 2.7 mg/L
pH: 6.5
Total Alkalinity: 613 mg/L

The maximum concentrations for major constituents within the formation water in the entire injection interval are as follows:

Chloride: 27,000 mg/L
TDS: 44,700 mg/L
Diesel Range Organics: 20.5 mg/L
Extended Range Organics: 5.6 mg/L
pH: 6.7
Total Alkalinity: 670 mg/L

The results of the formation water analysis support and confirm the conclusions presented from the geophysical logs, mud log, and sidewall cores that the injection zone clearly does not contain recoverable hydrocarbons. Included in Appendix D is Geolex's No Recoverable Hydrocarbon Summary report, which was required by the BLMs COA, and submitted to the BLM and NMOCD.

X.

Log Section Across Proposed Devonian Injection Interval

SONIC LOG - GAMMA RAY

BERGER

SCHLUMBERGER WELL SURVEYING CORPORATION

K-9-T24S-R35E 1980FS 1980FW
RICKS EXPLORATION, INC.
CUSTER MOUNTAIN UNIT #1
30-025-20756

A-14

COMPANY MIDWEST OIL CORPORATION

NM 01128-A

WELL CUSTER MOUNTAIN UNIT FEDERAL # 1

FIELD WILDCAT

COUNTY LEA STATE NEW MEXICO

LOCATION 1980' FROM S/L
1980' FROM E/L

COI FIEL LOC WEI COI

Sec. 9 Twp. 24S Rge. 35E

Other Services:
IIL, PML

Permanent Datum: GL, Elev. 3386
Log Measured From KB, 18 Ft. Above Perm. Datum
Drilling Measured From KB

Elev.: K.B. 3404
D.F. 3403
G.L. 3386

Date	10-30-63	11-7-63	1-19-64	2-27-64
Run No.	ONE -BHC	TWO -BHC	THREE-BHC	FOUR-BHC
Depth—Driller	11940	12458	15375	16590
Depth—Logger	11944	12460	15379	16588
Btm. Log Interval	11935	12451	15370	16584
Top Log Interval	0	11800	12451	15368
Casing—Driller	13 3/8@ 5240	13 3/8@ 5240	9 5/8@12456	7" @ 15372
Casing—Logger	-	-	-	15368
Bit Size	12¼"	12¼"	8 3/8"	6 1/8"
Type Fluid in Hole	GEL, CAUSTIC SPERSENE *	GEL, DRIS, CAUS, SPERSENE	GEL, CAUS	GEL-BARITE
Dens. | Visc.	9.0 | 34	9.0 | 41	13.2 | 71	8.8 | 40
pH | Fluid Loss	11 | 8.8 ml	11.5 | 8 ml	8.5 | 1.9 ml	9.5 | 5 ml
Source of Sample	PIT	CIRC.	CIRC.	PIT
R_m @ Meas. Temp.	.56 @ 76 °F	.76 @ 80 °F	.90 @ 76 °F	1.37 @ 82 °F
R_{mf} @ Meas. Temp	.41 @ 76 °F	.53 @ 80 °F	.52 @ 78 °F	1.02 @ 68 °F
R_{mc} @ Meas. Temp.	1.71 @ 76 °F	1.3 @ 80 °F	1.2 @ 78 °F	2.52 @ 68 °F
Source: R_{mf} R_{mc}	M | M	M | M	M | M	M | M
R_m @ BHT	.26 @164 °F	.34 @ 165°F	.35 @185 °F	- @ 199°F
Time Since Circ.	3 HOURS	4 HOURS	10 HOURS	6 HOURS
Max. Rec. Temp.	164 °F	165 °F	185 °F	199 °F
Equip. | Location	3701 | HOBBS	2519 | HOBBS	2519 | HOBBS	1582 KLR
Recorded By	BROWN	WILSON-ADKISSON	WILSON	EASLEY
Witnessed By	MC INTYRE	MC INTYRE	BOTTOMS	BOTTOMS

REMARKS *DRILLING MILK OIL

Scale Changes

Changes in Mud Type or Additional Samples	Type Log	Depth	Scale Up Hole	Scale Down Hole
Date | Sample No.				
Depth—Driller				
Type Fluid in Hole				
Dens. | Visc.				
ph | Fluid Loss ml				
Source of Sample				
R_m @ Meas. Temp.	@ °F	@ °F	@ °F	@ °F
R_{mf} @ Meas. Temp	@ °F	@ °F	@ °F	@ °F
R_{mc} @ Meas. Temp	@ °F	@ °F	@ °F	@ °F
Source: R_{mf} R_{mc}				
R_m @ BHT	@ °F	@ °F	@ °F	@ °F
R_{mf} @ BHT	@ °F	@ °F	@ °F	@ °F
R_{mc} @ BHT	@ °F	@ °F	@ °F	@ °F

Equipment Data

Run No.	Tool Type	Pad Type	Tool Pos.	Other

C.D.: YES S.O.: -CENTRALIZED WITH SPRING GUIDE & CALIPER
Equip. Used: CART. No. X4 RUN 2- X4 RUN-3 X4 RUN 4 X-3 RUN 4: C.D. USED S.O. 1/2"

SONDE No. X3 X3 X3 4X-3

CALIBRATION	BACKGND. CPS	SOURCE CPS	GALV. INCR. DIVISIONS	SENS. TAP (FOR CAL.)	SENS. TAP (RECORD)	TIME CONST.	RECORDING SPEED (FT./MIN.)	
GAMMA RAY	64	416	32.5	500	400	1		RUN 1
RUN 2-	60	460	32.5	400	200	1	45	RUN 2
RUN 3-	50	450	32.5	400	200	2	20	RUN 3
RUN 4	75	470	82.5	800	500	2	30/60	RUN 4

Velocity (feet per second) = $\frac{1{,}000{,}000}{\text{Interval Transit Time (microseconds per foot)}}$

GAMMA RAY
API UNITS

DEPTHS

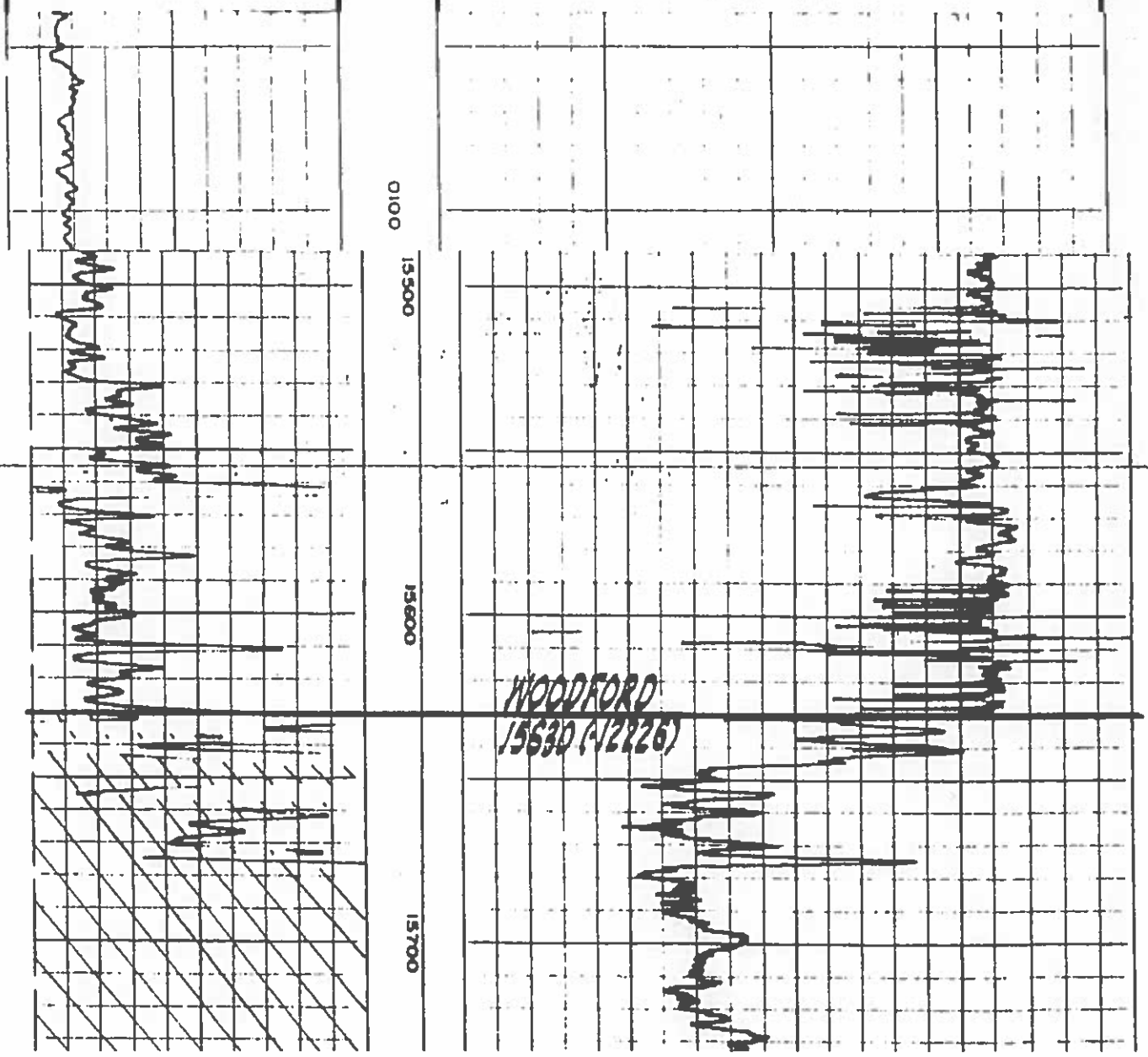
INTERVAL TRANSIT TIME
MICROSECONDS PER FOOT

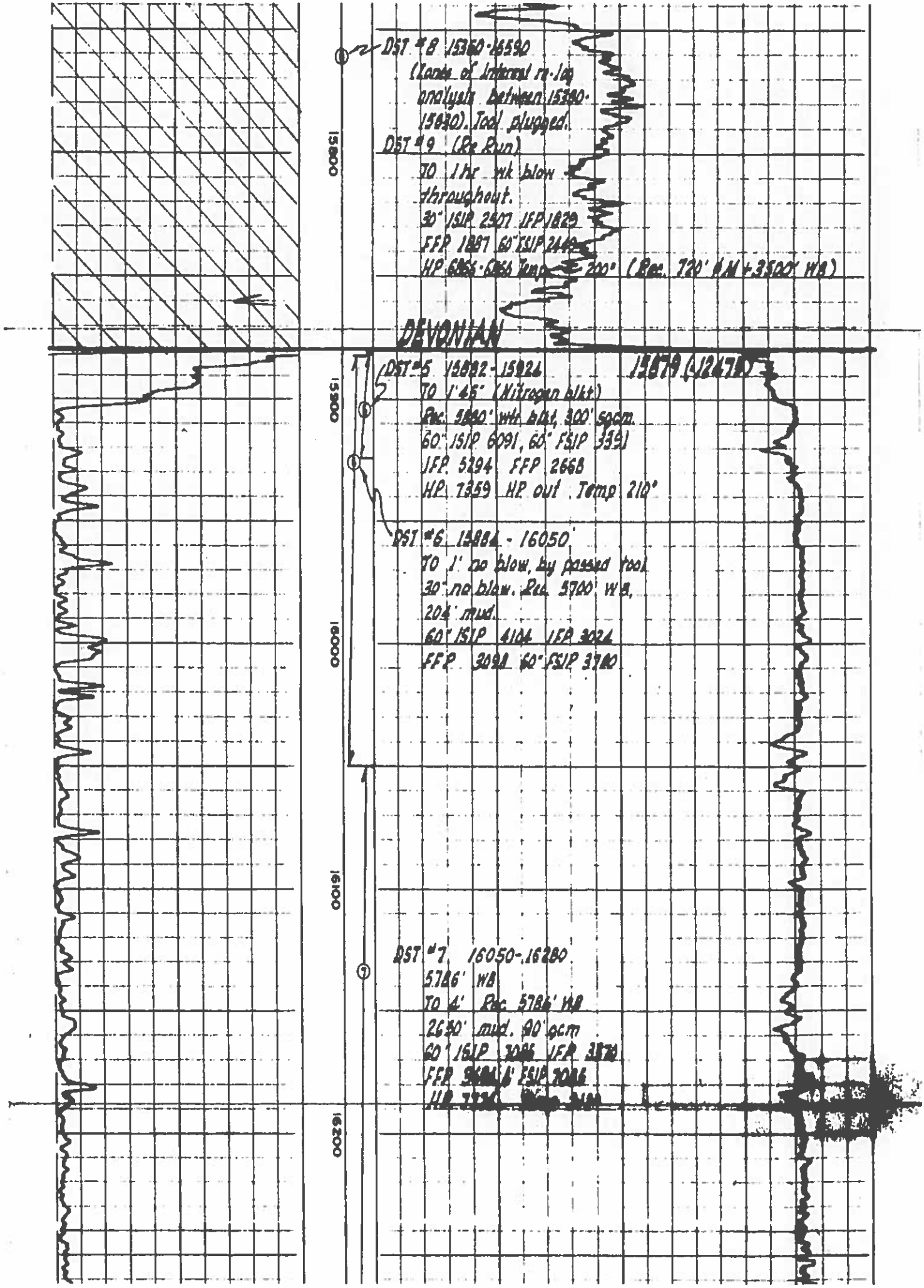
T 3 R1 4 R2

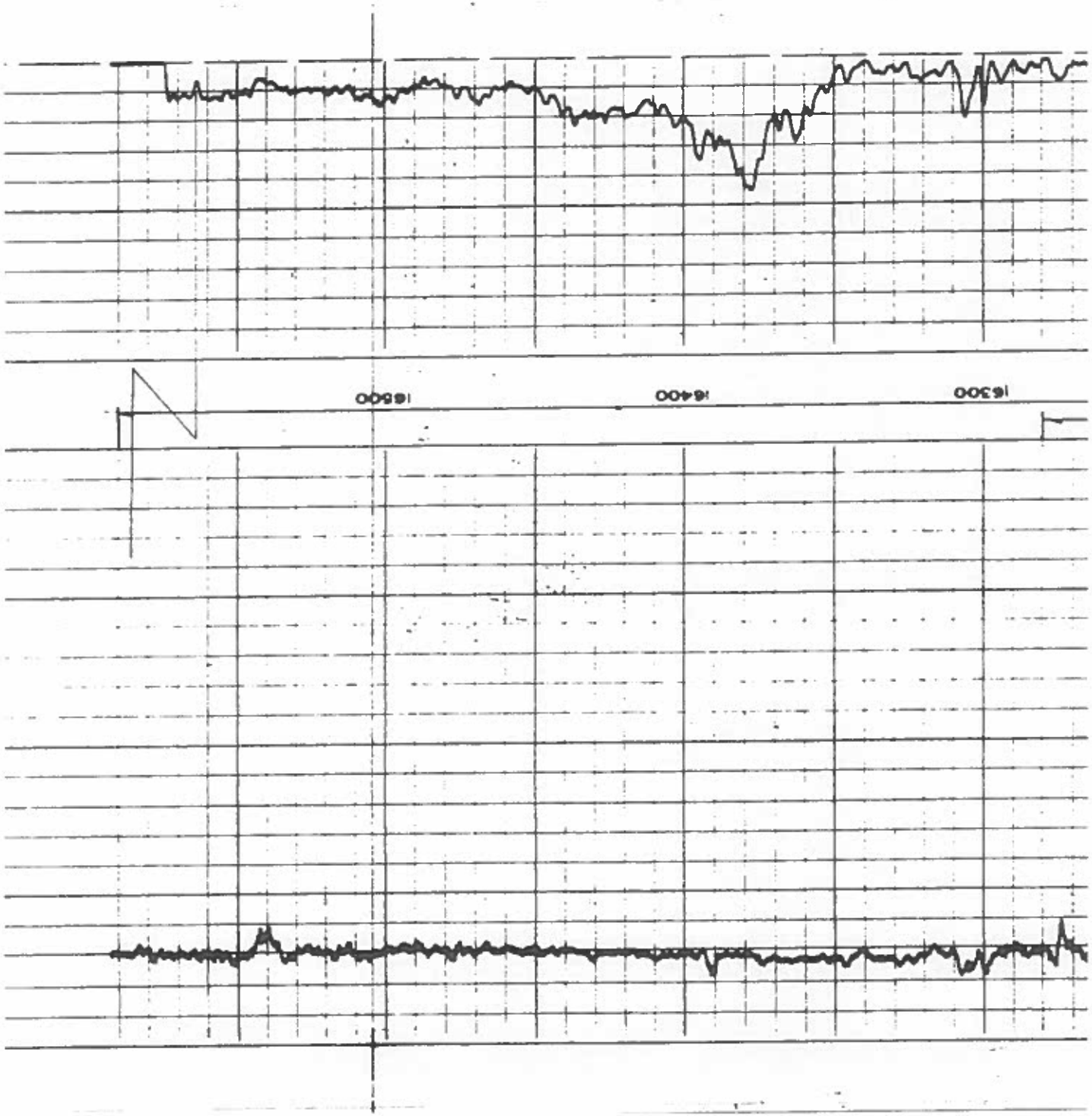
0 100 200

100 70 40

160 130 100




DST #8 15360-16590
(Leaks of Internal rn. Inj
analysis between 15380-
15830). Tool plugged.
DST #9 (Re Run)
30 1 hr wk blow
throughout.
30" ISIP 2907 IFP 1829
FFP 1867 60" FSIP 2449
HP 6866-6866 Temp 200° (Rec. 720' HM + 3500' WB)
DEVONIAN
15879 (-12478)
DST #5 15892-15924
30 1'45" (Nitrogen blkt)
Rec. 5880' wtr. blkt, 300' sgcm.
60" ISIP 6091, 60" FSIP 3391
IFP 5294 FFP 2668
HP 7359 HP out . Temp 210°
DST #6 15984 - 16050'
30 1' no blow, by passed tool
30" no blow. Rec. 5700' WB,
204' mud
60" ISIP 4104 IFP 3024
FFP 3098 60" FSIP 3740
DST #7 16050-16280
5786' WB
30 4' Rec. 5786' WB
2650' mud. 40' gcm
60" ISIP 7086 IFP 3870
FFP 7086 FSIP 7086
HP 7750
15800
15900
16000
16100
16200


16300
16400
16500

9-24S-35E

DUAL INDUCTION - LATEROLOG

K-9-T24S-R35E 1980FS 1980FW
RICKS EXPLORATION, INC.
CUSTER MOUNTAIN UNIT #1
30-025-20766

COMPANY MIDWEST OIL CORPORATION

WELL CUSTER MOUNTAIN UNIT FEDERAL # 1

FIELD WILDCAT

COUNTY LEA , NEW MEXICO

LOCATION 1980' FROM S/L
1980' FROM E/L

Other Services:
BSGR, PML
NL, SRS

COUNTY LEA STATE NEW MEXICO

Sec. 9 Twp. 24S Rge. 35E

Permanent Datum: GL , Elev. 3386
Log Measured From KB 18 Ft. Above Perm. Datum
Drilling Measured From KB

Elev.: K.B. 3404
D.F. 3403
G.L. 3386

Date	10-30-63	11-7-63	1-19-64	2-27-64
Run No.	ONE	TWO	THREE	FOUR
Depth—Driller	11940	12458	15375	16590
Depth—Logger	11944	12460	14402	16588
Btm. Log Interval	11942	12458	14400	16585
Top Log Interval	5240	11942	12456	15368
Casing—Driller	13 3/8 @ 5240	13 3/8 @ 5240	9 5/8 @ 12456	7" @ 15375
Casing—Logger	-	-	12456	15368
Bit Size	12¼"	12¼"	8 5/8"	6 1/8"
Type Fluid in Hole	GEL, CAUSTIC SPERESENE	GEL, DRIS, CAUS SPERESENE	GEL, CAUS BARITE	GEL-BARITE
Dens. / Visc.	9.0 / 34	9.0 / 41	13.2 / 7.1	8.8 / 40
pH / Fluid Loss	11 / 8.8 ml	11.5 / 8 ml	9 / 1.9 ml	9.5 / 6 ml
Source of Sample	PIT	CIRC.	CIRC.	PIT
R_m @ Meas. Temp.	.56 @ 76 °F	.76 @ 80 °F	.90 @ 76 °F	1.37 @ 82 °F
R_{mf} @ Meas. Temp.	.41 @ 76 °F	.53 @ 80 °F	.52 @ 78 °F	1.02 @ 68 °F
R_{mc} @ Meas. Temp.	1.71 @ 76 °F	1.3 @ 80 °F	1.2 @ 78 °F	2.52 @ 68 °F
Source: R_{mf} R_{mc}	M / M	M / M	M / M	M / M
R_m @ BHT	.26 @ 164 °F	.34 @ 165 °F	.35 @ 185 °F	- @ 199 °F
Time Since Circ.	8 HOURS	5 HOURS	12 HOURS	6 HOURS
Max. Rec. Temp.	164 °F	165 °F	185 °F	199 °F
Equip. / Location	3701 / HOBBS	2519 / HOBBS	2519 / HOBBS	1582 / KER.
Recorded By	BROWN	WILSON-ADKISSON	WILSON	EASLEY
Witnessed By	MC INTYRE	MC INTYRE	BOTTOMS	BOTTOMS

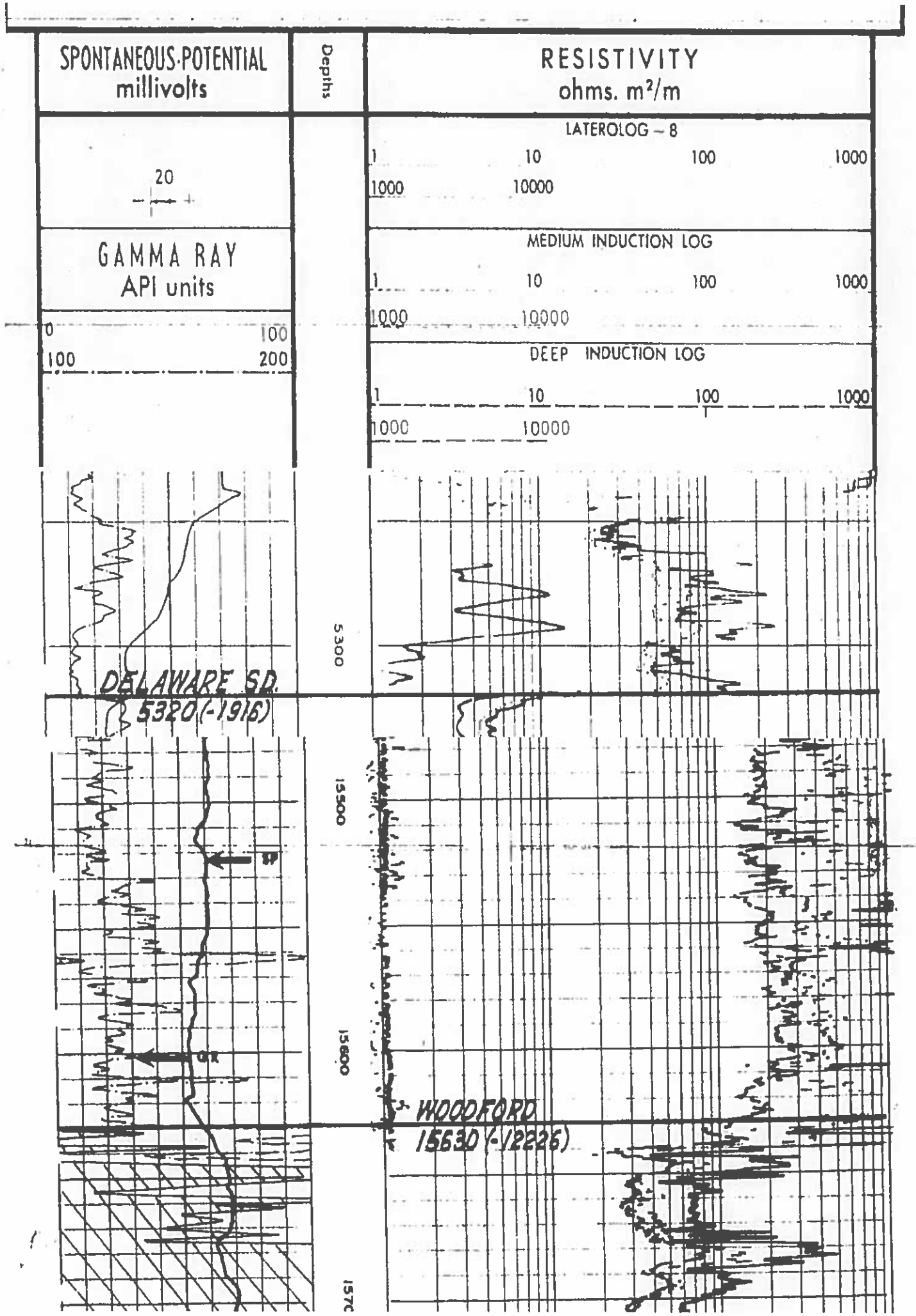
REMARKS DRILLING MILK, OIL

Changes in Mud Type or Additional Samples
Date
Sample No.
Depth—Driller
Type Fluid in Hole
Dens. / Visc.
pH / Fluid Loss ml
Source of Sample
R_m @ Meas. Temp. °F
R_{mf} @ Meas. Temp. °F
R_{mc} @ Meas. Temp. °F
Source: R_{mf} R_{mc}
R_m @ BHT °F
R_{mf} @ BHT °F
R_{mc} @ BHT °F

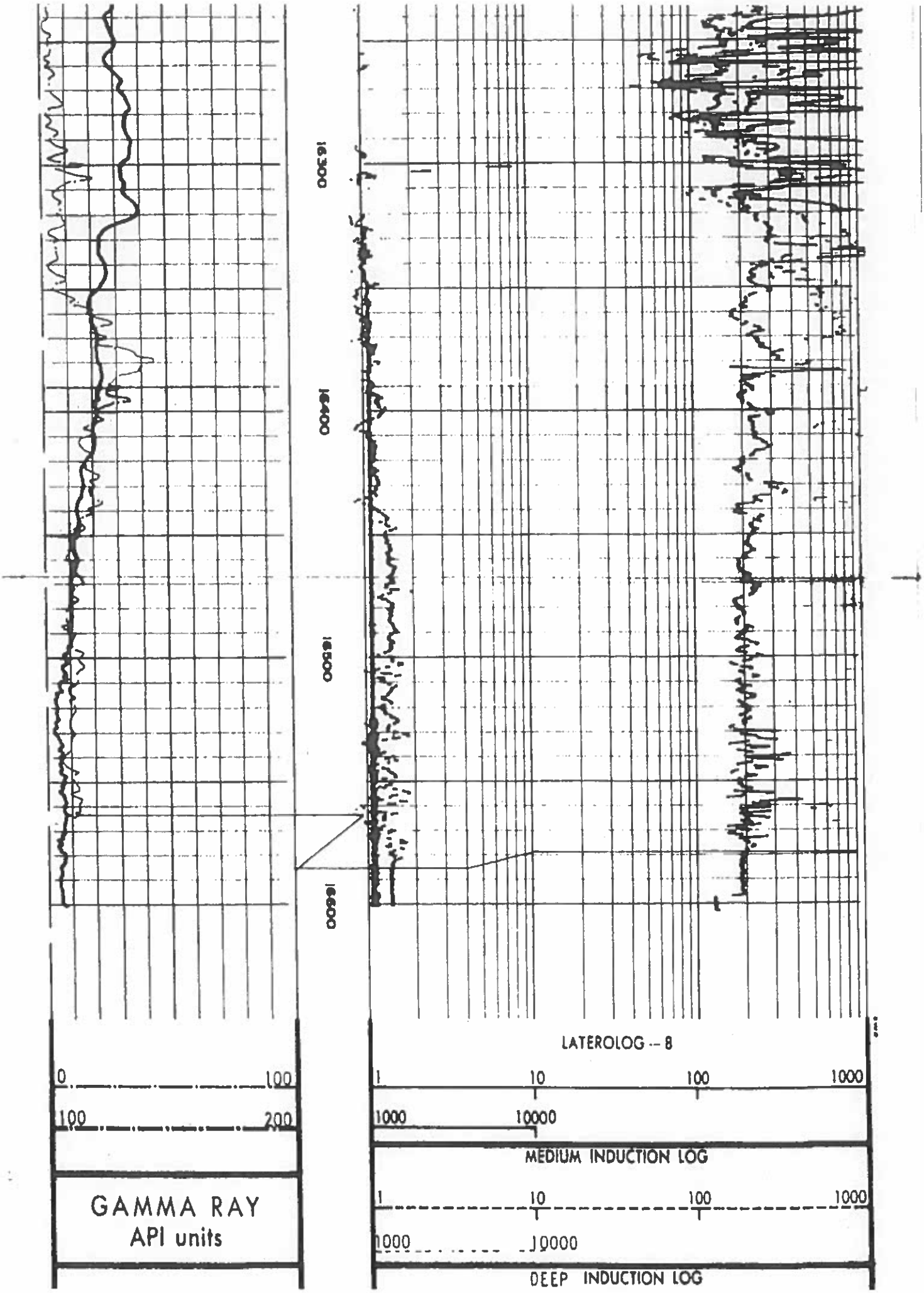
Scale Changes
Type Log Depth Scale Up Hole Scale Down Hole

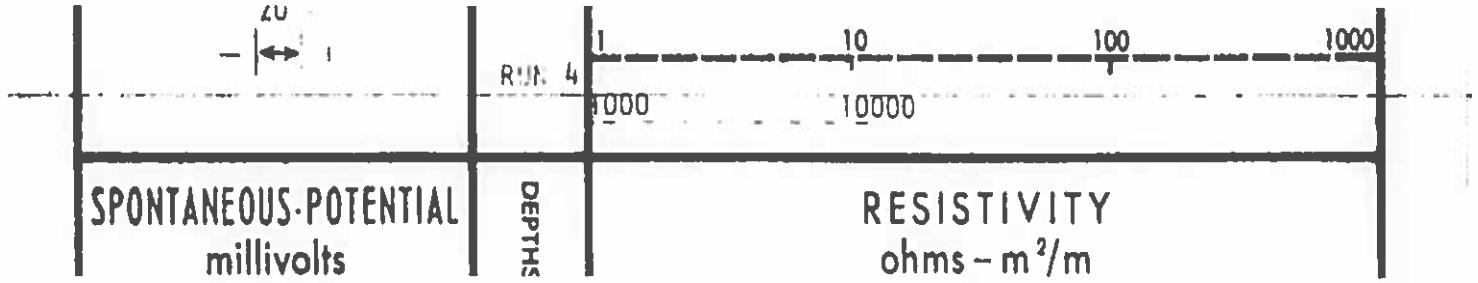
Equipment Data
Run No. Tool Type Tool Position Other

C.D.: YES S.O.: 1½" RUN 4: C.D.: USED S.O.: 1/2"
Equip. Used CART. No. 22 22 SBR-1
Panel No. X2 AX-2
SONDE No. 4R 4R


SPONTANEOUS-POTENTIAL
millivolts
Depths
RESISTIVITY
ohms. m²/m
20
LATEROLOG – 8
1
10
100
1000
1000
10000
GAMMA RAY
API units
MEDIUM INDUCTION LOG
0
100
100
200
DEEP INDUCTION LOG
5300
DELAWARE SD.
5320 (-1916)
15500
15600
WOODFORD
15630 (-12226)
15700

15800
15900
16000
16100
16200
DEVONIAN
15879 (H2475)


16300
16400
16500
16600
LATEROLOG -- 8
0
100
200
1
10
100
1000
10000
MEDIUM INDUCTION LOG
GAMMA RAY
API units
DEEP INDUCTION LOG


20
RUN 4
1
10
100
1000
1000
10000
SPONTANEOUS-POTENTIAL
millivolts
DEPTHS
RESISTIVITY
ohms – m²/m

XI.

Fresh Water Sample Analyses
There Are No FW Wells Within 1 Mile from NMOSE Records

New Mexico Office of the State Engineer

Active & Inactive Points of Diversion

(with Ownership Information)

(R=POD has been replaced and no longer serves this file; C=the file is closed) (quarters are 1=NW 2=NE 3=SW 4=SE) (quarters are smallest to largest) (NAD83 UTM in meters) (acre ft per annum)

WR File Nbr	Sub basin	Use	Diversion	Owner	County	POD Number	Well Tag	Code	Grant	Source	q q q 6416 4	Sec	Twn	Rng	X	Y
CP 01708	CP	EXP	0	LIMESTONE LIVESTOCK LLC	LE	CP 01708 POD1	NA				2 1	36	23S	34E	648262	3571205

Record Count: 1

> 1 mi. away

No record of well being drilled

PLSS Search:

Section(s): 36 Township: 23S Range: 34E

Sorted by: File Number

New Mexico Office of the State Engineer

Water Column/Average Depth to Water

(quarters are 1=NW 2=NE 3=SW 4=SE)
(quarters are smallest to largest) (NAD83 UTM in meters)

No records found.

PLSS Search:

Section(s): 36 **Township:** 23S **Range:** 34E

New Mexico Office of the State Engineer

Active & Inactive Points of Diversion

(with Ownership Information)

No PODs found

PLSS Search:

Section(s): 31, 32 Township: 23S Range: 35E

New Mexico Office of the State Engineer

Active & Inactive Points of Diversion

(with Ownership Information)

No PODs found

PLSS Search:

Section(s): 1 Township: 24S Range: 34E

New Mexico Office of the State Engineer

Active & Inactive Points of Diversion

(with Ownership Information)

(R=POD has been replaced and no longer serves this file. C=the file is closed) (quarters are 1=NW 2=NE 3=SW 4=SE) (quarters are smallest to largest) (NAD83 UTM in meters)

(acre ft per annum)

WR File Nbr	Sub basin	Use	Diversion	Owner	County	POD Number	Well Tag	Code	Grant	Source	q q q 64 16 4	Sec	Twn	Rng	X	Y
CP 01197	CP	COM	150	QUAIL RANCH, LLC	LE	CP 01197 POD1					1 3	06	24S	35E	649528	3568790

Record Count: 1

No record of well being drilled

PLSS Search:

Section(s): 5, 6, 7 Township: 24S Range: 35E

Sorted by: File Number

Application legal notice NE/4 NW/4 SW/4

New Mexico Office of the State Engineer
Transaction Summary

COWNF Change of Ownership Full

Transaction Number: 635445 **Transaction Desc:** CP 01197 **File Date:** 11/28/2018

Primary Status: CHG Change of Ownership
Secondary Status: PRC Processed
Person Assigned: *******
Applicant: QUAIL RANCH, LLC
Contact: DYLAN VAN BRUNT
Applicant: GENERAL COUNSEL OFFICE
Contact: CHRISTOPHER BOEHLER

Events

	Date	Type	Description	Comment	Processed By
get images	11/28/2018	APP	Application Received	*	*******
	12/07/2018	FTN	Finalize non-published Trans.		*******
	01/03/2019	QAT	Quality Assurance Completed	DATA	*******
	01/16/2019	QAT	Quality Assurance Completed	IMAGE	*******

Water Right Information

WR File Nbr	Acres	Diversion	Consumptive	Purpose of Use
CP 01197	0	0		COM COMMERCIAL

New Mexico Office of the State Engineer

Transaction Summary

APPRO Application to Appropriate

Transaction Number: 604754 **Transaction Desc:** CP 01197 **File Date:** 09/03/2013

Primary Status: PMT Permit
Secondary Status: APR Approved
Person Assigned: *******
Applicant: RUBERT (BERT) MADERA
Applicant: A.J. OLSEN

Events

	Date	Type	Description	Comment	Processed By
get images	09/03/2013	APP	Application Received	*	*******
	09/11/2013	NFP	Notice for Publication		*******
	10/10/2013	AOP	Affidavit of Publication rcv		*******
	03/24/2014	LCB	Log/PCW/PBU Approval		*******
	03/24/2014	FIN	Final Action on application		*******
	03/28/2017	QAT	Quality Assurance Completed	SQ2	*******
	03/30/2017	QAT	Quality Assurance Completed	IMAGE	*******

Water Right Information

WR File Nbr	Acres	Diversion	Consumptive	Purpose of Use
CP 01197	0	150	150	COM COMMERCIAL

****Point of Diversion**

CP 01197 POD1		649528	3568790

****Place of Use**

Q 256	Q 64	Q 16	Q 4	Sec	Tws	Rng	Acres	Diversion	Consumptive	Use	Priority	Status	Other Loc Desc
							0	150	150	COM	09/03/2013	DCL	NO PLACE OF USE GIVEN

Remarks

"APPLICATION IS MADE TO DRILL A NEW WELL FOR THE APPROPRIATION OF UP TO 150.0 AC-FT PER ANNUM OF GROUNDWATER IN THE CAPITAN UNDERGROUND WATER BASIN FOR LIVESTOCK WATERING, INDUSTRIAL, COMMERCIAL WATER SALES, CONSTRUCTION OF PUBLIC WORKS,

PROSPECTING, MINING AND/OR DRILLING OPERATIONS TO DISCOVER OR DEVELOP NATURAL RESOURCES."

Conditions

Affidavit of Publication

STATE OF NEW MEXICO
COUNTY OF LEA

I, Daniel Russell, Publisher of the Hobbs News-Sun, a newspaper published at Hobbs, New Mexico, solemnly swear that the clipping attached hereto was published in the regular and entire issue of said newspaper, and not a supplement thereof for a period of 1 issue(s).

Beginning with the issue dated
May 10, 2019
and ending with the issue dated
May 10, 2019.

Publisher

Sworn and subscribed to before me this
10th day of May 2019.

Business Manager

My commission expires
January 29, 2023
(Seal)

OFFICIAL SEAL
GUSSIE BLACK
Notary Public
State of New Mexico
My Commission Expires 1-29-23

This newspaper is duly qualified to publish legal notices or advertisements within the meaning of Section 3, Chapter 167, Laws of 1937 and payment of fees for said

LEGAL NOTICES
MAY 10, 2019

COG Operating LLC, 2208 W. Main Street, Artesia, New Mexico, 88210, has filed Form C-108 (Application for Authorization to Inject) with the New Mexico Oil Conservation Division seeking administrative approval for a salt water disposal well. The proposed well, the Vamoose 6 Fee SWD No. 1, is located 225' FNL and 2400' FWL, Section 6, Township 24 South, Range 35 East, Lea County, New Mexico. Disposal water will be sourced from area wells producing from the Delaware, Bone Spring and Wolfcamp formations. The disposal water will be injected into the Devonian/Silurian formation at an estimated depth of 15,400' to 17,200' at a maximum surface pressure of 3080 psi and a maximum rate of 40,000 BWPD. The proposed SWD well is located approximately 14.5 miles west/northwest of Jal. Any interested party who has an objection to this must give notice in writing to the Oil Conservation Division, 1220 South Saint Francis Street, Santa Fe, New Mexico, 87505, within fifteen (15) days of this notice. Any interested party with questions or comments may contact Brian Collins at COG Operating LLC, 2208 W. Main Street, Artesia, New Mexico 88210, or call 575-748-6940.
#34124

67112034 00228175

COG OPERATING LLC - ARTESIA
2208 W. MAIN ST.
ARTESIA, NM 88210

HOBBS NEWS-SUN
LEGAL NOTICES

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Published in the Hobbs News-Sun Hobbs, New Mexico
_____, 2019.