

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

OCD-ARTEZIA

FORM APPROVED
OMB NO. 1004-0135
Expires: July 31, 2010**SUNDRY NOTICES AND REPORTS ON WELLS**
*Do not use this form for proposals to drill or to re-enter an abandoned well. Use form 3160-3 (APD) for such proposals.***SUBMIT IN TRIPLICATE - Other instructions on reverse side.**

1. Type of Well ☒ Oil Well ☐ Gas Well ☐ Other		5. Lease Serial No. NMNM110350
2. Name of Operator COG OPERATING LLC		6. If Indian, Allottee or Tribe Name
Contact: STORMI DAVIS E-Mail: sdavis@concho.com		7. If Unit or CA/Agreement, Name and/or No.
3a. Address 2208 WEST MAIN ARTESIA, NM 88210	3b. Phone No. (include area code) Ph: 575-748-6946	8. Well Name and No. CRAPSHOOT 13 FEDERAL 1H
4. Location of Well (Footage, Sec., T., R., M., or Survey Description) Sec 24 T20S R29E Mer NMP NENE 230FNL 1040FEL		9. API Well No. 30-015-42323
		10. Field and Pool, or Exploratory PARKWAY; BONE SPRING
		11. County or Parish, and State EDDY COUNTY, NM

12. CHECK APPROPRIATE BOX(ES) TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA

TYPE OF SUBMISSION	TYPE OF ACTION			
☐ Notice of Intent	☐ Acidize	☐ Deepen	☐ Production (Start/Resume)	☐ Water Shut-Off
☒ Subsequent Report	☐ Alter Casing	☐ Fracture Treat	☐ Reclamation	☐ Well Integrity
☐ Final Abandonment Notice	☐ Casing Repair	☐ New Construction	☐ Recomplete	☐ Other
	☐ Change Plans	☐ Plug and Abandon	☐ Temporarily Abandon	
	☐ Convert to Injection	☐ Plug Back	☒ Water Disposal	

13. Describe Proposed or Completed Operation (clearly state all pertinent details, including estimated starting date of any proposed work and approximate duration thereof. If the proposal is to deepen directionally or recompleat horizontally, give subsurface locations and measured and true vertical depths of all pertinent markers and zones. Attach the Bond under which the work will be performed or provide the Bond No. on file with BLM/BIA. Required subsequent reports shall be filed within 30 days following completion of the involved operations. If the operation results in a multiple completion or recompleat in a new interval, a Form 3160-4 shall be filed once testing has been completed. Final Abandonment Notices shall be filed only after all requirements, including reclamation, have been completed, and the operator has determined that the site is ready for final inspection.)

- 1) Name of formation producing water on lease: Bone Spring
- 2) Amount of water produced in barrels per day: 1800 BWPD
- 3) How water is stored on lease: 2 - 500 bbl fiberglass tanks
- 4) How water is moved to disposal facility: Trucked
- 5) Disposal Facility:
 - a) Facility Operator Name: COG Operating LLC
 - b) Name of facility or well name & number: State HU Com #1 SWD (Order SWD-841)
 - c) Type of facility or well: WDW
 - d) Location by 1/4, 1/4, Section, Township & Range: SESW, Sec 7-T19S-R28E

NM OIL CONSERVATION
ARTESIA DISTRICT

FEB 12 2015

RECEIVED SEE ATTACHED FOR
CONDITIONS OF APPROVAL

Accepted for record

NM OCD

2/13/15

14. I hereby certify that the foregoing is true and correct.

Electronic Submission #262446 verified by the BLM Well Information System
For COG OPERATING LLC, sent to the Carlsbad
Committed to AFMSS for processing by DEBORAH HAM on 12/02/2014 ()

Name (Printed/Typed) STORMI DAVIS	Title PREPARER	APPROVED
Signature (Electronic Submission)	Date 09/10/2014	

THIS SPACE FOR FEDERAL OR STATE OFFICE USE

FEB 4 2015

Approved By _____	Title _____	JAMES A. AM SUPERVISOR-EPS
Conditions of approval, if any, are attached. Approval of this notice does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon.	Office _____	

Title 18 U.S.C. Section 1001 and Title 43 U.S.C. Section 1212, make it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

**** OPERATOR-SUBMITTED ** OPERATOR-SUBMITTED ** OPERATOR-SUBMITTED ****

BUREAU OF LAND MANAGEMENT
Carlsbad Field Office
620 East Greene Street
Carlsbad, New Mexico 88220
575-234-5972

Disposal of Produced Water From Federal Wells
Conditions of Approval

Approval of the produced water disposal methodology is subject to the following conditions of approval:

1. This agency shall be notified of any change in your method or location of disposal.
2. Compliance with all provisions of Onshore Order No. 7.
3. This agency shall be notified of any spill or discharge as required by NTL-3A.
4. This agency reserves the right to modify or rescind approval whenever it determines continued use of the approved method may adversely affect the surface or subsurface environments.
5. Any on-lease open top storage tanks shall be covered with a protective cover to prevent entry by birds and other wildlife.
6. This approval should not constitute the granting of any right-of-way or construction rights not granted by the lease instrument.
7. If water is transported via a pipeline that extends beyond the lease boundary, then you need to submit within 30 days an application for right-of-way approval to the Realty Section in this office if you have not already done so.
8. Disposal at any other site will require prior approval.
9. Subject to like approval by NMOCD.

7/10/14

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

FORM APPROVED
OMB NO. 1004-0137
Expires March 31, 2007

SUNDRY NOTICES AND REPORTS ON WELLS

Do not use this form for proposals to drill or to re-enter an abandoned well. Use Form 3160-3 (APD) for such proposals.

SUBMIT IN TRIPLICATE - Other instructions on reverse side

1. Type of Well ☒ Oil Well ☐ Gas Well ☐ Other		5. Lease Serial No. NMNM0554221
2. Name of Operator XTO Energy Inc.		6. If Indian, Allottee or Tribe Name
3a. Address 500 W. Illinois St Ste 100 Midland, TX 79701	3b. Phone No. (include area code) 432-620-6714	7. If Unit or CA/Agreement, Name and/or No. 891014168X
4. Location of Well (Footage, Sec., T., R., M., or Survey Description) SHL: 550'FNL & 1565'FWL, C-18-23S-30E BHL: 190'FNL & 2372'FWL, 3-6-23S-30E		8. Well Name and No. NASH UNIT 45H
		9. API Well No. 30-015-42048
		10. Field and Pool, or Exploratory Area NASH DRAW; BRUSHY CANYON
		11. County or Parish, State EDDY NM

12. CHECK APPROPRIATE BOX(ES) TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA

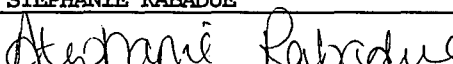
TYPE OF SUBMISSION	TYPE OF ACTION			
☐ Notice of Intent	☐ Acidize	☐ Deepen	☐ Production (Start/Resume)	☐ Water Shut-Off
☒ Subsequent Report	☐ Alter Casing	☐ Fracture Treat	☐ Reclamation	☐ Well Integrity
☐ Final Abandonment Notice	☐ Casing Repair	☒ New Construction	☐ Recomplete	☐ Other _____
	☐ Change Plans	☐ Plug and Abandon	☐ Temporarily Abandon	
	☐ Convert to Injection	☐ Plug Back	☐ Water Disposal	

13. Describe Proposed or Completed Operation (clearly state all pertinent details, including estimated starting date of any proposed work and approximate duration thereof. If the proposal is to deepen directionally or recompleat horizontally, give subsurface locations and measured and true vertical depths of all pertinent markers and zones. Attach the Bond under which the work will be performed or provide the Bond No. on file with BLM/BIA. Required subsequent reports shall be filed within 30 days following completion of the involved operations. If the operation results in a multiple completion or recompleat in a new interval, a Form 3160-4 shall be filed once testing has been completed. Final Abandonment Notices shall be filed only after all requirements, including reclamation, have been completed, and the operator has determined that the final site is ready for final inspection.)
- 09/05-10/17/2014: CO & frac well w/CT unit & perf/plug in 40 stages. Frac focus on file.
- 10/21-11/18/2014: CO well post frac w/foam N2 unit. Could not get pipe free. Begin fishing. POOH w/fish, full recovery.
- 11/19/2014:RIH w/tbg & pkr. Set pkr @ 6004'. Flowback & test well.
- 12/05-12/10/2014: MIRU. POOH w/tbg & pkr, RIH w/ 2-7/8" tbg & ESP. Set tbg @ 6101'. Well on prod.

NM OIL CONSERVATION
ARTESIA DISTRICT

FEB 27 2015

RECEIVED

14. I hereby certify that the foregoing is true and correct Name (Printed/Typed) STEPHANIE RABADUE	Title REGULATORY ANALYST
	Date 01/07/2015

THIS SPACE FOR FEDERAL OR STATE OFFICE USE

Approved by	Title	Date
Conditions of approval, if any, are attached. Approval of this notice does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon.	Office	
Title 18 U.S.C. Section 1001, and Title 43 U.S.C. Section 1212, makes it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.		



I JAVIER ESTRADA certify that I am employed by Vaughn Energy Services. That I did on the day(s) of 07/19/14 through 07/19/14 conduct or supervise the taking of a HA GYRO survey from a depth of 0 feet to a depth of 5960 feet; that the data is true, correct, complete and within the limitations of the tool as set forth by Vaughn Energy Services, that I am authorized and qualified to make this report; that this survey was conducted at the request of XTO ENERGY for the NASH UNIT Well # 45H API # 30-015-42048 in EDDY County / Parish NEW MEXICO; and that I have reviewed this report and find that it conforms to the principles and procedures as set forth by Vaughn Energy Services


JAVIER ESTRADA
Service Technician
Vaughn Energy Services

XTOENERGY

Company: XTO ENERGY
Lease/Well: NASH UNIT /45H

Rig Name: PIONEER 33
State/County: NEW MEXICO /EDDY
Latitude: 32.31, Longitude: -103.92
GRID North is 0.22 Degrees East of True North
VS-Azi: 3.66 Degrees



Depth Reference : R.K.B=17FT

DRILLOG HA GYRO SURVEY CALCULATIONS

Filename: nash unit 45h.ut
Minimum Curvature Method
Report Date/Time: 7/25/2014 / 16:20

VES Survey International
(432) 563-5444
West Texas
Surveyor: Javier Estrada
Nash Unit 45H / API 30-015-42048

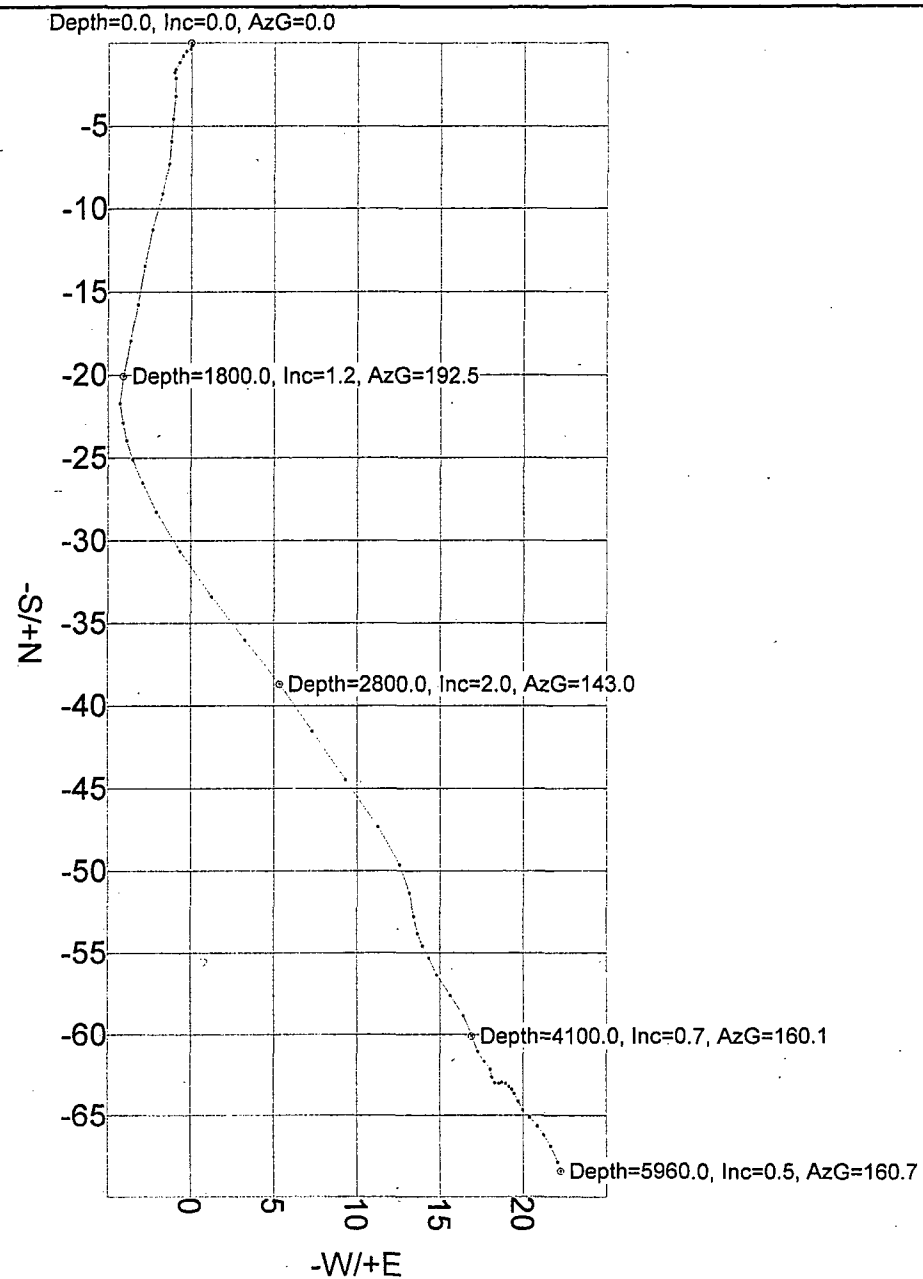
Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	****
100.00	0.18	173.08	100.00	-0.16	0.02	-0.16	0.16	173.08	0.18
200.00	0.10	239.92	200.00	-0.36	-0.04	-0.36	0.36	186.06	0.17
300.00	0.25	242.34	300.00	-0.51	-0.31	-0.52	0.59	211.40	0.15
400.00	0.19	182.63	400.00	-0.77	-0.51	-0.80	0.93	213.48	0.23
500.00	0.35	219.77	500.00	-1.17	-0.71	-1.21	1.37	211.34	0.23
600.00	0.22	193.79	600.00	-1.59	-0.95	-1.65	1.85	210.90	0.18
700.00	0.03	286.90	700.00	-1.77	-1.02	-1.84	2.05	209.91	0.23
800.00	0.44	165.69	799.99	-2.14	-0.95	-2.20	2.34	203.81	0.46
900.00	0.77	189.07	899.99	-3.19	-0.96	-3.24	3.33	196.71	0.41
1000.00	0.82	183.60	999.98	-4.57	-1.11	-4.63	4.70	193.64	0.09
1100.00	0.74	184.85	1099.97	-5.92	-1.21	-5.98	6.04	191.53	0.08
1200.00	0.84	184.76	1199.96	-7.29	-1.32	-7.36	7.41	190.28	0.10
1300.00	1.28	196.74	1299.94	-9.09	-1.71	-9.18	9.25	190.62	0.49
1400.00	1.27	195.33	1399.92	-11.23	-2.32	-11.36	11.47	191.67	0.03
1500.00	1.33	188.98	1499.89	-13.45	-2.79	-13.60	13.74	191.74	0.16
1600.00	1.35	191.02	1599.87	-15.75	-3.20	-15.92	16.07	191.49	0.05
1700.00	1.21	190.61	1699.84	-17.95	-3.62	-18.14	18.31	191.41	0.13
1800.00	1.24	192.54	1799.82	-20.04	-4.05	-20.26	20.45	191.42	0.05

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
1900.00	0.70	178.51	1899.80	-21.70	-4.27	-21.93	22.12	191.13	0.58
2000.00	0.66	163.95	1999.80	-22.86	-4.09	-23.08	23.23	190.15	0.18
2100.00	0.61	174.45	2099.79	-23.95	-3.88	-24.15	24.26	189.21	0.13
2200.00	0.78	153.36	2199.78	-25.09	-3.53	-25.26	25.33	188.00	0.30
2300.00	0.98	158.54	2299.77	-26.49	-2.91	-26.63	26.65	186.26	0.22
2400.00	1.27	151.30	2399.75	-28.26	-2.06	-28.34	28.34	184.17	0.32
2500.00	1.89	147.64	2499.71	-30.62	-0.65	-30.60	30.63	181.21	0.63
2600.00	1.93	143.38	2599.66	-33.37	1.24	-33.22	33.39	177.87	0.15
2700.00	1.90	141.41	2699.60	-36.02	3.28	-35.74	36.17	174.79	0.07
2800.00	1.99	142.99	2799.54	-38.70	5.36	-38.28	39.07	172.12	0.10
2900.00	1.95	147.65	2899.49	-41.52	7.31	-40.97	42.16	170.01	0.16
3000.00	2.15	143.94	2999.42	-44.46	9.32	-43.78	45.43	168.16	0.24
3100.00	1.79	147.96	3099.36	-47.30	11.25	-46.49	48.62	166.62	0.38
3200.00	1.23	154.73	3199.33	-49.60	12.54	-48.70	51.16	165.81	0.59
3300.00	0.91	170.56	3299.31	-51.36	13.13	-50.41	53.01	165.66	0.44
3400.00	0.75	167.46	3399.30	-52.78	13.40	-51.82	54.46	165.75	0.16
3500.00	0.47	167.96	3499.29	-53.83	13.63	-52.85	55.53	165.79	0.28
3600.00	0.47	147.71	3599.29	-54.58	13.94	-53.58	56.33	165.68	0.17
3700.00	0.49	158.67	3699.29	-55.32	14.31	-54.30	57.14	165.50	0.09
3800.00	0.84	152.89	3799.28	-56.37	14.80	-55.31	58.28	165.29	0.36
3900.00	0.87	140.90	3899.27	-57.61	15.61	-56.49	59.68	164.84	0.18
4000.00	0.82	154.86	3999.26	-58.84	16.39	-57.68	61.08	164.43	0.21
4100.00	0.72	160.10	4099.25	-60.08	16.91	-58.88	62.42	164.28	0.12
4200.00	0.46	161.62	4199.24	-61.06	17.25	-59.84	63.45	164.22	0.26
4300.00	0.45	129.48	4299.24	-61.69	17.68	-60.44	64.18	164.01	0.25
4400.00	0.32	166.89	4399.24	-62.21	18.05	-60.93	64.78	163.82	0.27
4500.00	0.26	178.51	4499.24	-62.71	18.12	-61.43	65.28	163.89	0.08
4600.00	0.25	122.84	4599.24	-63.06	18.31	-61.76	65.66	163.81	0.24
4700.00	0.11	33.61	4699.24	-63.10	18.55	-61.78	65.77	163.62	0.27
4800.00	0.15	97.90	4799.24	-63.03	18.73	-61.71	65.76	163.45	0.15
4900.00	0.14	114.82	4899.24	-63.10	18.97	-61.76	65.89	163.26	0.05
5000.00	0.18	146.26	4999.24	-63.28	19.17	-61.93	66.12	163.15	0.09
5100.00	0.10	120.08	5099.24	-63.45	19.33	-62.09	66.33	163.06	0.10
5200.00	0.24	159.32	5199.23	-63.69	19.47	-62.32	66.60	163.00	0.18
5300.00	0.35	148.75	5299.23	-64.14	19.70	-62.76	67.10	162.92	0.12
5400.00	0.34	155.34	5399.23	-64.67	19.98	-63.26	67.69	162.83	0.04
5500.00	0.38	125.97	5499.23	-65.13	20.38	-63.70	68.25	162.63	0.19
5600.00	0.46	150.08	5599.23	-65.67	20.84	-64.21	68.90	162.39	0.19
5700.00	0.29	136.44	5699.23	-66.20	21.22	-64.71	69.52	162.23	0.19

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
5800.00	0.64	153.23	5799.22	-66.88	21.64	-65.36	70.30	162.07	0.37
5900.00	0.58	161.43	5899.22	-67.86	22.05	-66.31	71.35	162.00	0.10
5960.00	0.52	160.67	5959.21	-68.41	22.24	-66.85	71.93	161.99	0.10

XTOENERGY

VES Survey International
(432) 563-5444
West Texas
Surveyor: Javier Estrada
Nash Unit 45H / API 30-015-42048



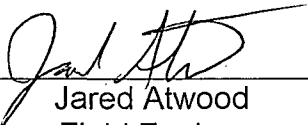
VES Survey Date: 07/19/2014

3950 Interwood South Parkway • Houston, TX 77032

PHONE 281.986.4400 • FAX 281.986.4499

State of New Mexico, Eddy County

I, Jared Atwood, certify that I am employed by Halliburton Energy Services, Inc. (aka Sperry Drilling) and that on the dates of 19-July-14 through 13-August- 14, I did conduct or supervise the taking of a MWD directional surveys for the well from a depth of 6028' MD to a depth of 17390' MD. This data is true, correct, complete and within the limitations of the tools as set forth by Halliburton Energy Services, Inc. (aka Sperry Drilling). I am authorized and qualified to make this report and this survey was conducted at the request of XTO Energy Inc., for the Nash Unit 45H well, API No. 30-015-42048-0000 in Eddy County, New Mexico. I have reviewed this report and find that it conforms to the principles and procedures as set forth by Halliburton Energy Services, Inc. (aka Sperry Drilling).



Jared Atwood
Field Engineer

DIRECTIONAL SURVEY DATA

Tie-in

0.00

0.00

0.00

0.00

0.00 N

0.00 E

Measured Depth (ft)	Inclination (deg)	Direction (deg)	Vertical Depth (ft)	Latitude (ft)	Departure (ft)	Vertical Section (ft)	Dogleg (%/100)
100.00	0.18	173.08	100.00	0.16 S	0.02 E	-0.15	0.18
200.00	0.10	239.92	200.00	0.36 S	0.04 W	-0.36	0.17
300.00	0.25	242.34	300.00	0.50 S	0.31 W	-0.52	0.15
400.00	0.19	182.63	400.00	0.77 S	0.51 W	-0.80	0.23
500.00	0.35	219.77	500.00	1.17 S	0.71 W	-1.21	0.23
600.00	0.22	193.79	600.00	1.59 S	0.95 W	-1.65	0.18
700.00	0.03	286.90	700.00	1.77 S	1.02 W	-1.83	0.22
800.00	0.44	165.69	800.00	2.13 S	0.95 W	-2.19	0.46
900.00	0.77	189.07	899.99	3.17 S	0.96 W	-3.22	0.41
1000.00	0.82	183.60	999.98	4.55 S	1.11 W	-4.61	0.09
1100.00	0.74	184.85	1,099.97	5.90 S	1.21 W	-5.97	0.08
1200.00	0.84	184.76	1,199.96	7.28 S	1.33 W	-7.35	0.10
1300.00	1.28	196.74	1,299.94	9.08 S	1.71 W	-9.17	0.49
1400.00	1.27	195.33	1,399.92	11.22 S	2.33 W	-11.34	0.03
1500.00	1.33	188.98	1,499.89	13.43 S	2.80 W	-13.58	0.16
1600.00	1.35	191.02	1,599.87	15.73 S	3.21 W	-15.91	0.05
1700.00	1.21	190.61	1,699.84	17.93 S	3.63 W	-18.12	0.14
1800.00	1.24	192.54	1,799.82	20.02 S	4.06 W	-20.24	0.05
1900.00	0.70	178.51	1,899.80	21.69 S	4.27 W	-21.92	0.59
2000.00	0.66	163.95	1,999.80	22.85 S	4.10 W	-23.07	0.18
2100.00	0.61	174.45	2,099.79	23.94 S	3.89 W	-24.14	0.13
2200.00	0.78	153.36	2,199.78	25.07 S	3.53 W	-25.25	0.30
2300.00	0.98	158.54	2,299.77	26.48 S	2.91 W	-26.61	0.22
2400.00	1.27	151.30	2,399.75	28.25 S	2.07 W	-28.32	0.32
2500.00	1.89	147.64	2,499.71	30.61 S	0.65 W	-30.59	0.63
2600.00	1.93	143.38	2,599.66	33.36 S	1.23 E	-33.21	0.15
2700.00	1.90	141.41	2,699.60	36.00 S	3.27 E	-35.72	0.07
2800.00	1.99	142.99	2,799.55	38.69 S	5.35 E	-38.26	0.10
2900.00	1.95	147.65	2,899.49	41.51 S	7.31 E	-40.96	0.17
3000.00	2.15	143.94	2,999.42	44.46 S	9.32 E	-43.78	0.24
3100.00	1.79	147.96	3,099.36	47.30 S	11.25 E	-46.49	0.39
3200.00	1.23	154.73	3,199.33	49.60 S	12.54 E	-48.70	0.59
3300.00	0.91	170.56	3,299.31	51.35 S	13.13 E	-50.41	0.43
3400.00	0.75	167.46	3,399.30	52.77 S	13.40 E	-51.81	0.17
3500.00	0.47	167.96	3,499.29	53.81 S	13.63 E	-52.83	0.28
3600.00	0.47	147.71	3,599.29	54.56 S	13.93 E	-53.56	0.17
3700.00	0.49	158.67	3,699.29	55.31 S	14.31 E	-54.28	0.09
3800.00	0.84	152.89	3,799.28	56.36 S	14.80 E	-55.30	0.36
3900.00	0.87	140.90	3,899.27	57.60 S	15.61 E	-56.48	0.18
4000.00	0.82	154.86	3,999.26	58.84 S	16.39 E	-57.67	0.21
4100.00	0.72	160.10	4,099.25	60.07 S	16.91 E	-58.87	0.12

DIRECTIONAL SURVEY DATA

Measured Depth (ft)	Inclination (deg)	Direction (deg)	Vertical Depth (ft)	Latitude (ft)	Departure (ft)	Vertical Section (ft)	Dogleg (%/100)
4200.00	0.46	161.62	4,199.24	61.05 S	17.25 E	-59.82	0.26
4300.00	0.45	129.48	4,299.24	61.68 S	17.68 E	-60.42	0.25
4400.00	0.32	166.89	4,399.24	62.20 S	18.05 E	-60.92	0.28
4500.00	0.26	178.51	4,499.24	62.70 S	18.12 E	-61.41	0.08
4600.00	0.25	122.84	4,599.24	63.04 S	18.31 E	-61.75	0.24
4700.00	0.11	33.61	4,699.24	63.08 S	18.54 E	-61.77	0.27
4800.00	0.15	97.90	4,799.24	63.02 S	18.72 E	-61.69	0.14
4900.00	0.14	114.82	4,899.24	63.09 S	18.97 E	-61.75	0.04
5000.00	0.18	146.26	4,999.24	63.27 S	19.16 E	-61.92	0.09
5100.00	0.10	120.08	5,099.24	63.44 S	19.33 E	-62.08	0.10
5200.00	0.24	159.32	5,199.23	63.68 S	19.48 E	-62.31	0.17
5300.00	0.35	148.75	5,299.23	64.14 S	19.71 E	-62.75	0.12
5400.00	0.34	155.34	5,399.23	64.67 S	19.99 E	-63.26	0.04
5500.00	0.38	125.97	5,499.23	65.14 S	20.38 E	-63.70	0.19
5600.00	0.46	150.08	5,599.23	65.68 S	20.85 E	-64.21	0.19
5700.00	0.29	136.44	5,699.23	66.21 S	21.23 E	-64.72	0.19
5800.00	0.64	153.23	5,799.22	66.89 S	21.65 E	-65.37	0.37
5900.00	0.58	161.43	5,899.22	67.87 S	22.06 E	-66.32	0.11
5960.00	0.52	160.67	5,959.21	68.42 S	22.25 E	-66.86	0.10
6028.00	0.22	167.95	6,027.21	68.84 S	22.38 E	-67.27	0.44
6059.00	1.57	39.48	6,058.21	68.57 S	22.66 E	-66.98	5.55
6091.00	5.70	36.68	6,090.14	66.95 S	23.89 E	-65.29	12.90
6123.00	9.59	30.38	6,121.85	63.38 S	26.19 E	-61.58	12.42
6154.00	12.93	24.50	6,152.25	57.99 S	28.94 E	-56.03	11.37
6186.00	14.94	19.41	6,183.31	50.85 S	31.79 E	-48.71	7.36
6218.00	18.37	15.36	6,213.96	42.09 S	34.50 E	-39.80	11.30
6249.00	21.36	11.50	6,243.11	31.85 S	36.92 E	-29.42	10.53
6281.00	24.60	8.18	6,272.57	19.54 S	39.03 E	-17.01	10.91
6312.00	28.01	6.00	6,300.36	5.91 S	40.71 E	-3.30	11.43
6343.00	30.74	4.24	6,327.37	9.24 N	42.06 E	11.90	9.24
6375.00	32.61	2.02	6,354.60	26.01 N	42.97 E	28.70	6.88
6406.00	34.06	0.71	6,380.50	43.04 N	43.37 E	45.72	5.23
6437.00	34.83	358.36	6,406.06	60.57 N	43.22 E	63.21	4.96
6469.00	34.40	357.08	6,432.40	78.74 N	42.50 E	81.29	2.63
6500.00	34.16	357.19	6,458.02	96.18 N	41.63 E	98.64	0.80
6532.00	34.31	357.35	6,484.47	114.16 N	40.77 E	116.53	0.55
6563.00	33.45	357.65	6,510.21	131.42 N	40.02 E	133.71	2.84
6595.00	33.56	357.88	6,536.89	149.07 N	39.33 E	151.28	0.52
6626.00	33.40	358.31	6,562.75	166.16 N	38.76 E	168.30	0.91
6657.00	33.22	358.31	6,588.65	183.18 N	38.26 E	185.25	0.57
6688.00	32.77	358.38	6,614.65	200.06 N	37.77 E	202.06	1.46
6719.00	33.05	358.14	6,640.68	216.89 N	37.26 E	218.83	0.99
6750.00	33.40	358.49	6,666.61	233.87 N	36.76 E	235.74	1.29
6781.00	36.30	359.90	6,692.05	251.58 N	36.52 E	253.40	9.71
6817.00	40.34	2.53	6,720.29	273.88 N	37.01 E	275.69	12.11



DIRECTIONAL SURVEY DATA

Measured Depth (ft)	Inclination (deg)	Direction (deg)	Vertical Depth (ft)	Latitude (ft)	Departure (ft)	Vertical Section (ft)	Dogleg (°/100')
6846.00	43.24	3.76	6,741.91	293.18 N	38.08 E	295.01	10.39
6875.00	45.31	3.82	6,762.67	313.38 N	39.42 E	315.26	7.12
6907.00	48.60	3.76	6,784.51	336.71 N	40.97 E	338.64	10.30
6939.00	50.89	3.41	6,805.19	361.08 N	42.49 E	363.06	7.19
6970.00	54.83	2.90	6,823.90	385.75 N	43.85 E	387.76	12.77
7002.00	58.10	3.76	6,841.58	412.37 N	45.40 E	414.43	10.46
7033.00	61.79	3.59	6,857.11	439.14 N	47.12 E	441.26	11.92
7065.00	63.45	3.75	6,871.82	467.50 N	48.94 E	469.67	5.22
7096.00	66.62	3.41	6,884.91	495.55 N	50.70 E	497.77	10.28
7127.00	70.14	3.06	6,896.33	524.31 N	52.32 E	526.58	11.39
7159.00	71.81	2.71	6,906.76	554.53 N	53.84 E	556.83	5.32
7190.00	74.44	2.53	6,915.76	584.16 N	55.20 E	586.49	8.52
7222.00	76.46	3.06	6,923.79	615.09 N	56.71 E	617.46	6.52
7253.00	78.13	2.88	6,930.61	645.29 N	58.28 E	647.70	5.42
7285.00	80.16	3.06	6,936.64	676.68 N	59.91 E	679.12	6.34
7313.00	83.52	3.26	6,940.61	704.35 N	61.44 E	706.83	12.03
7412.00	90.86	4.85	6,945.46	802.91 N	68.43 E	805.64	7.59
7506.00	89.44	3.75	6,945.21	896.64 N	75.48 E	899.63	1.91
7602.00	88.33	8.37	6,947.07	992.06 N	85.61 E	995.50	4.96
7690.00	87.69	6.07	6,950.13	1,079.30 N	96.66 E	1083.27	2.72
7786.00	90.83	8.04	6,951.37	1,174.55 N	108.45 E	1179.08	3.87
7881.00	91.54	5.37	6,949.40	1,268.87 N	119.54 E	1273.91	2.91
7976.00	90.68	3.12	6,947.56	1,363.58 N	126.57 E	1368.88	2.53
8071.00	89.72	2.28	6,947.22	1,458.48 N	131.05 E	1463.87	1.34
8167.00	91.14	3.94	6,946.50	1,554.33 N	136.26 E	1559.85	2.27
8262.00	91.01	0.60	6,944.72	1,649.22 N	140.03 E	1654.80	3.52
8358.00	85.36	359.68	6,947.75	1,745.13 N	140.26 E	1750.53	5.97
8453.00	88.83	359.75	6,952.56	1,840.00 N	139.79 E	1845.17	3.65
8548.00	92.31	1.86	6,951.62	1,934.96 N	141.12 E	1940.02	4.28
8643.00	93.95	2.16	6,946.44	2,029.76 N	144.45 E	2034.84	1.76
8738.00	92.44	0.98	6,941.15	2,124.57 N	147.04 E	2129.62	2.02
8833.00	92.56	3.33	6,937.02	2,219.41 N	150.61 E	2224.50	2.48
8928.00	89.97	3.99	6,934.92	2,314.18 N	156.67 E	2319.46	2.81
9023.00	90.74	4.21	6,934.34	2,408.94 N	163.47 E	2414.46	0.84
9118.00	86.79	2.83	6,936.38	2,503.71 N	169.30 E	2509.41	4.40
9213.00	87.13	4.50	6,941.42	2,598.38 N	175.37 E	2604.28	1.79
9308.00	85.41	5.14	6,947.60	2,692.84 N	183.33 E	2699.05	1.93
9404.00	87.22	5.85	6,953.78	2,788.20 N	192.50 E	2794.80	2.03
9499.00	90.74	5.59	6,955.47	2,882.69 N	201.97 E	2889.71	3.71
9594.00	89.29	5.00	6,955.45	2,977.29 N	210.74 E	2984.67	1.65
9690.00	91.14	4.11	6,955.08	3,072.98 N	218.36 E	3080.65	2.14
9785.00	88.09	2.90	6,955.72	3,167.78 N	224.17 E	3175.63	3.45
9879.00	90.22	3.74	6,957.11	3,261.61 N	229.61 E	3269.62	2.43
9974.00	90.46	3.16	6,956.55	3,356.44 N	235.33 E	3364.61	0.66
10069.00	91.48	3.06	6,954.94	3,451.28 N	240.48 E	3459.59	1.08



DIRECTIONAL SURVEY DATA

Measured Depth (ft)	Inclination (deg)	Direction (deg)	Vertical Depth (ft)	Latitude (ft)	Departure (ft)	Vertical Section (ft)	Dogleg (%/100)
10097.00	90.95	2.76	6,954.35	3,479.24 N	241.90 E	3487.58	2.16
10190.00	89.78	3.36	6,953.75	3,572.10 N	246.86 E	3580.58	1.41
10282.00	89.63	3.32	6,954.22	3,663.95 N	252.21 E	3672.57	0.17
10377.00	91.94	4.04	6,952.92	3,758.73 N	258.31 E	3767.56	2.55
10473.00	92.90	4.38	6,948.86	3,854.39 N	265.35 E	3863.47	1.06
10568.00	91.98	4.77	6,944.83	3,949.00 N	272.92 E	3958.37	1.05
10663.00	87.87	3.00	6,944.95	4,043.76 N	279.35 E	4053.34	4.70
10758.00	92.93	6.37	6,944.29	4,138.39 N	287.11 E	4148.28	6.40
10854.00	87.99	1.66	6,943.52	4,234.10 N	293.83 E	4244.22	7.11
10949.00	92.50	3.00	6,943.11	4,328.99 N	297.69 E	4339.17	4.95
11045.00	88.43	2.34	6,942.33	4,424.86 N	302.16 E	4435.13	4.29
11140.00	89.78	7.83	6,943.81	4,519.44 N	310.58 E	4530.05	5.96
11235.00	90.43	8.83	6,943.63	4,613.43 N	324.35 E	4624.73	1.25
11330.00	92.56	10.83	6,941.15	4,707.00 N	340.56 E	4719.14	3.07
11426.00	89.78	10.92	6,939.19	4,801.24 N	358.67 E	4814.35	2.89
11521.00	90.56	10.93	6,938.91	4,894.52 N	376.68 E	4908.58	0.81
11616.00	91.11	7.35	6,937.52	4,988.29 N	391.76 E	5003.12	3.81
11711.00	89.48	0.62	6,937.04	5,083.00 N	398.36 E	5098.06	7.29
11807.00	90.40	1.41	6,937.14	5,178.98 N	400.06 E	5193.96	1.26
11902.00	88.12	359.87	6,938.37	5,273.96 N	401.12 E	5288.81	2.90
11997.00	89.91	0.88	6,940.00	5,368.94 N	401.75 E	5383.63	2.16
12093.00	89.94	0.94	6,940.13	5,464.93 N	403.28 E	5479.52	0.06
12188.00	89.20	359.62	6,940.85	5,559.92 N	403.74 E	5574.35	1.59
12283.00	91.97	2.34	6,939.88	5,654.88 N	405.36 E	5669.23	4.09
12378.00	89.66	0.31	6,938.52	5,749.84 N	407.56 E	5764.13	3.24
12473.00	89.72	0.94	6,939.03	5,844.83 N	408.59 E	5858.99	0.66
12569.00	89.17	1.16	6,939.96	5,940.81 N	410.35 E	5954.89	0.62
12664.00	90.43	2.41	6,940.29	6,035.76 N	413.30 E	6049.83	1.88
12759.00	88.46	359.41	6,941.21	6,130.73 N	414.82 E	6144.70	3.78
12854.00	90.37	1.47	6,942.18	6,225.71 N	415.54 E	6239.54	2.95
12950.00	90.59	0.88	6,941.38	6,321.68 N	417.51 E	6335.44	0.65
13044.00	92.28	5.79	6,939.03	6,415.46 N	422.97 E	6429.38	5.53
13139.00	92.80	4.98	6,934.82	6,509.95 N	431.88 E	6524.24	1.02
13234.00	92.37	5.84	6,930.53	6,604.43 N	440.83 E	6619.10	1.01
13329.00	93.06	6.58	6,926.04	6,698.76 N	451.09 E	6713.90	1.06
13424.00	90.43	6.18	6,923.15	6,793.12 N	461.64 E	6808.74	2.79
13520.00	87.29	5.77	6,925.06	6,888.57 N	471.63 E	6904.63	3.30
13615.00	87.23	4.86	6,929.59	6,983.05 N	480.42 E	6999.48	0.96
13710.00	86.52	3.11	6,934.77	7,077.68 N	487.01 E	7094.33	1.98
13807.00	86.37	3.88	6,940.79	7,174.31 N	492.91 E	7191.15	0.81
13902.00	87.72	6.14	6,945.69	7,268.81 N	501.20 E	7285.98	2.76
13961.00	87.32	5.74	6,948.24	7,327.44 N	507.30 E	7344.88	0.95
14056.00	92.40	5.94	6,948.47	7,421.92 N	516.96 E	7439.78	5.36
14151.00	92.10	5.15	6,944.74	7,516.40 N	526.13 E	7534.66	0.88
14247.00	90.37	1.59	6,942.67	7,612.19 N	531.77 E	7630.61	4.13



DIRECTIONAL SURVEY DATA

Measured Depth (ft)	Inclination (deg)	Direction (deg)	Vertical Depth (ft)	Latitude (ft)	Departure (ft)	Vertical Section (ft)	Dogleg (%/100)
14342.00	90.34	1.28	6,942.08	7,707.16 N	534.15 E	7725.54	0.32
14438.00	90.06	0.28	6,941.75	7,803.15 N	535.46 E	7821.42	1.09
14533.00	90.40	0.59	6,941.36	7,898.15 N	536.18 E	7916.27	0.49
14628.00	92.16	1.69	6,939.25	7,993.10 N	538.07 E	8011.15	2.18
14724.00	89.72	2.10	6,937.67	8,089.03 N	541.24 E	8107.08	2.57
14819.00	90.34	3.49	6,937.63	8,183.91 N	545.87 E	8202.06	1.60
14851.00	92.00	4.43	6,936.97	8,215.83 N	548.08 E	8234.06	5.96
14914.00	90.37	3.41	6,935.67	8,278.66 N	552.39 E	8297.04	3.05
15009.00	89.48	4.26	6,935.80	8,373.45 N	558.75 E	8392.04	1.30
15105.00	89.88	6.30	6,936.34	8,469.03 N	567.58 E	8487.99	2.16
15200.00	89.57	7.89	6,936.80	8,563.30 N	579.32 E	8582.82	1.71
15295.00	91.11	10.86	6,936.24	8,657.02 N	594.79 E	8677.33	3.52
15390.00	89.82	11.51	6,935.47	8,750.21 N	613.22 E	8771.51	1.53
15447.00	88.15	9.55	6,936.48	8,806.23 N	623.63 E	8828.08	4.52
15485.00	90.52	12.26	6,936.92	8,843.54 N	630.82 E	8865.77	9.48
15547.00	90.59	9.53	6,936.32	8,904.41 N	642.53 E	8927.27	4.41
15581.00	90.25	7.70	6,936.07	8,938.03 N	647.62 E	8961.14	5.47
15622.00	89.57	7.23	6,936.14	8,978.68 N	652.95 E	9002.05	2.01
15676.00	88.86	6.86	6,936.88	9,032.27 N	659.57 E	9055.95	1.47
15771.00	88.03	6.08	6,939.46	9,126.63 N	670.27 E	9150.80	1.20
15866.00	84.69	4.32	6,945.49	9,221.03 N	678.87 E	9245.56	3.97
15961.00	84.66	2.60	6,954.30	9,315.44 N	684.58 E	9340.14	1.81
16056.00	85.68	0.96	6,962.30	9,410.05 N	687.52 E	9434.75	2.03
16152.00	88.15	1.86	6,967.47	9,505.88 N	689.88 E	9530.53	2.74
16247.00	89.23	0.92	6,969.64	9,600.82 N	692.18 E	9625.43	1.51
16342.00	92.34	1.17	6,968.33	9,695.78 N	693.92 E	9720.31	3.29
16437.00	88.77	359.89	6,967.41	9,790.76 N	694.79 E	9815.14	4.00
16533.00	93.09	2.79	6,965.86	9,886.69 N	697.03 E	9911.02	5.42
16628.00	91.94	1.58	6,961.69	9,981.52 N	700.64 E	10005.89	1.76
16724.00	92.28	1.29	6,958.15	10,077.43 N	703.04 E	10101.75	0.46
16819.00	92.19	1.72	6,954.45	10,172.32 N	705.53 E	10196.61	0.46
16914.00	93.15	2.79	6,950.02	10,267.14 N	709.26 E	10291.48	1.51
17009.00	93.14	4.23	6,944.82	10,361.82 N	715.06 E	10386.33	1.52
17104.00	90.83	2.33	6,941.53	10,456.60 N	720.50 E	10481.26	3.14
17199.00	89.97	1.59	6,940.86	10,551.54 N	723.75 E	10576.22	1.20
17294.00	90.34	3.05	6,940.61	10,646.46 N	727.59 E	10671.19	1.58
17390.00	90.37	4.68	6,940.01	10,742.23 N	734.06 E	10767.18	1.70
17485.00	90.37	4.68	6,939.40	10,836.92 N	741.81 E	10862.17	0.00

SURVEY FOOTER

SURVEYS CALCULATED USING SHORT COLLAR METHOD.
WELL ASSUMED VERTICAL AT WELLHEAD.

SURVEYS FROM 100' MD TO 5960' MD PROVIDED BY VAUGHN ENERGY SERVICES.
SURVEYS FROM 6028' MD TO 17390' MD PROVIDED BY SPERRY DRILLING.
SURVEY AT 17390' MD IS PROJECTED TO TD AT 17485' MD.

**SURVEY FOOTER****SPERRY DRILLING ENGINEERS: B. GERMAN, J. HUNT, J. ATWOOD, D. JETER****DIRECTIONAL SURVEY DATA NOTES**

- Calculation based on minimum curvature method.
- Survey coordinates relative to well system reference point.
- TVD values given relative to drilling measurement point.
- Vertical section relative to well head.
- Vertical section is computed along a direction of 3.66 degrees (Grid)
- A total correction of 7.28 deg from Magnetic north to Grid north has been applied
- Horizontal displacement is relative to the well head.
- Horizontal displacement (closure) at 17,485.00 feet is 10,862.27 feet along 3.92 degrees (Grid)

WARRANTY

HALLIBURTON ENERGY SERVICES, INC. WILL USE ITS BEST EFFORTS TO FURNISH CUSTOMERS WITH ACCURATE INFORMATION AND INTERPRETATIONS THAT ARE PART OF, AND INCIDENT TO, THE SERVICES PROVIDED. HOWEVER, HALLIBURTON ENERGY SERVICES, INC. CANNOT AND DOES NOT WARRANT THE ACCURACY OR CORRECTNESS OF SUCH INFORMATION AND INTERPRETATIONS. UNDER NO CIRCUMSTANCES SHOULD ANY SUCH INFORMATION OR INTERPRETATION BE RELIED UPON AS THE SOLE BASIS FOR ANY DRILLING, COMPLETION, PRODUCTION, OR FINANCIAL DECISION OR ANY PROCEDURE INVOLVING ANY RISK TO THE SAFETY OF ANY DRILLING VENTURE, DRILLING RIG OR ITS CREW OR ANY THIRD PARTY. THE CUSTOMER HAS FULL RESPONSIBILITY FOR ALL DRILLING, COMPLETION, AND PRODUCTION OPERATION. HALLIBURTON ENERGY SERVICES, INC. MAKES NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESSED OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, WITH RESPECT TO THE SERVICES RENDERED. IN NO EVENT WILL HALLIBURTON ENERGY SERVICES, INC. SERVICES BE LIABLE FOR FAILURE TO OBTAIN ANY PARTICULAR RESULTS OR FOR ANY DAMAGES, INCLUDING, BUT NOT LIMITED TO, INDIRECT, SPECIAL OR CONSEQUENTIAL DAMAGES, RESULTING FROM THE USE OF ANY INFORMATION OR INTERPRETATION PROVIDED BY HALLIBURTON ENERGY SERVICES, INC.



Halliburton/Sperry Drilling
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Houston, Texas 77032
Phone 281.986.4400
Fax 281.986.4498

NASH UNIT #45H
 SHL: 550' FNL & 1565' FWL
 SEC 18, T23S, R30E
 EDDY CO, NM
 API# 30-015-42048

ELEV: GL: 3015'
 KB: 3032'
 AGL: 17'

20" CONDUCTOR @ 90'.
 CMT'D W/186 SX READY MIX.
 CIRC SURF, CALC
 30" HOLE

17-1/2" HOLE

13-3/8" 54.5#, J-55 CSG SET @ 197'.
 CMT'D W/210SX. CIRC 50 SX, CBL.

12-1/2" HOLE

12/10/14 ESP DETAIL:
 185 JTS 2-7/8", 6.5#, L-80 TBG, 4' X 2-7/8", 6.5#, L-80 TBG SUB, 1.10' X 2-7/8"
 8" SN, 3 - DN-1750 PMPs, 356 STGS, 6.30' X 2-7/8" GAS SEP, 4' X 2-7/8"
 PI, 8' X 2-7/8" PROTECTOR, 150 HP MTR, 2' X 2-7/8" DESANDER, 4 JTS 2-7/8", 6.4#, L-80 TBG/BP. SN @ 5859'. PI @ 5930'. LANDED @ 6101'.

9-5/8" 36#, J-55 CSG SET @ 3198'.
 CMT'D W/1270 SX. CIRC 425SX, CBL.

TANGENT FOR PUMP: 6450'-6750' (39 DEG)

PLUG & PERF: 40 BPM. PLUG=SHADOW,
 LEAVING IN HOLE W/ 2.0" ID

Stage	Plug	8 holes	7 holes
2		17116	16960
3	16850	16750	16550
4	16450	16350	16150
5	16050	15950	15750
6	15650	15550	15350
7	15250	15150	14950
8	14850	14750	14550

8-1/4" HOLE

21' MJ @ 5773'

4-1/2" 11.60#, P-110 LINER FR/6688'-17635'
 R7" VERSA FLEX HANGER W/8" PBR @
 "NA" CEMENTED WITH 775 sx. Did not Circ
 TOL @ 6688' MD (TVD = 6615' @ 33')

KOP @ 6050'.

CURVE FR/6050'-7400'.

7# 26#, HCP-110 CSG SET @ 7362' (TVD = 6941' @ 85°)
 CMT'D STG 1 W/160 SX TUNED LIGHT, 210 SX HACOM, 2ND STG 500 SX PREM PLUS
 & 50SX ECONCEM DOWN BRADEN HEAD. 21' MJ @ 5773'.

Coil Sleeve		25 bpm	
Sleeve	Depth	Sleeve	Depth
1	14348	17	10784
2	14127	18	10565
3	13898	19	10337
4	13678	20	10116
5	13449	21	9896
6	13228	22	9667
7	13002	23	9443
8	12782	24	9226
9	12559	25	9000
10	12334	26	8778
11	12109	27	8555
12	11880	28	8326
13	11666	29	8096
14	11449	30	7875
15	11232	31	7652
16	11012	32	7427

EOL: 17635'
 TVD: 6940'
 TD: 17635'
 PBTD: 17542'

FS @ 17635
 FC @ 17587
 LC @ 17542
 RSI @ 17499