

Submit 1 Copy To Appropriate District Office
 District I - (575) 393-6161
 1625 N. French Dr., Hobbs, NM 88240
 District II - (575) 748-1283
 811 S. First St., Artesia, NM 88210
 District III - (505) 334-6178
 1000 Rio Brazos Rd., Aztec, NM 87410
 District IV - (505) 476-3460
 1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico
 Energy, Minerals and Natural Resources

Form C-103
 Revised July 18, 2013

OIL CONSERVATION DIVISION
 1220 South St. Francis Dr.
 Santa Fe, NM 87505

WELL API NO. 30-015-43990
5. Indicate Type of Lease STATE <input type="checkbox"/> FEE <input checked="" type="checkbox"/>
6. State Oil & Gas Lease No. -
7. Lease Name or Unit Agreement Name Willow Lake WC 15
8. Well Number 001H
9. OGRID Number 12361
10. Pool name or Wildcat Purple Sage Wolfcamp Gas Pool
11. Elevation (Show whether DR, RKB, RT, GR, etc.) 2995 GR

SUNDRY NOTICES AND REPORTS ON WELLS
 (DO NOT USE THIS FORM FOR PROPOSALS TO DRILL OR TO DEEPEN OR PLUG BACK TO A DIFFERENT RESERVOIR. USE "APPLICATION FOR PERMIT" (FORM C-101) FOR SUCH PROPOSALS.)

1. Type of Well: Oil Well Gas Well Other

2. Name of Operator
Kaiser-Francis Oil Company

3. Address of Operator
P. O. Box 21468, Tulsa, OK 74121-1468

4. Well Location
 Unit Letter I : 1995 feet from the South line and 120 feet from the East line
 Section 15 Township 24S Range 28E NMPM Eddy County

12. Check Appropriate Box to Indicate Nature of Notice, Report or Other Data

NOTICE OF INTENTION TO:		SUBSEQUENT REPORT OF:	
PERFORM REMEDIAL WORK <input type="checkbox"/>	PLUG AND ABANDON <input type="checkbox"/>	REMEDIAL WORK <input type="checkbox"/>	ALTERING CASING <input type="checkbox"/>
TEMPORARILY ABANDON <input type="checkbox"/>	CHANGE PLANS <input type="checkbox"/>	COMMENCE DRILLING OPNS. <input type="checkbox"/>	P AND A <input type="checkbox"/>
PULL OR ALTER CASING <input type="checkbox"/>	MULTIPLE COMPL. <input type="checkbox"/>	CASING/CEMENT JOB <input type="checkbox"/>	
DOWNHOLE COMMINGLE <input type="checkbox"/>			
CLOSED-LOOP SYSTEM <input type="checkbox"/>			
OTHER: Change SHL, BHL, TD & Casing Detail <input checked="" type="checkbox"/>		OTHER: <input type="checkbox"/>	

13. Describe proposed or completed operations. (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work). SEE RULE 19.15.7.14 NMAC. For Multiple Completions: Attach wellbore diagram of proposed completion or recompletion.

revious SHL: I 1995' FSL & 120' FEL Sec. 15-24S-28E * Previous Proposed TD: 15471'
 ew SHL: L 2030' FSL & 220' FWL Sec. 14-24S-28E New Proposed TD: 15540'
 revious BHL: L 2290' FSL & 280' FWL Sec. 15-24S-28E
 ew BHL: L 2250' FSL & 330' FWL Sec. 15-24S-28E

revious Casing Detail: 13 3/8" @ 500' w/580 sxs cmt. 9 5/8" @ 2700' w/830 sxs cmt.
 7" @ 11070' w/900 sxs cmt. 4 1/2" @ 15471' w/500 sxs cmt.

ew Casing Detail: 20" @ 350' w/615 sxs cmt. 13 3/8" @ 2700' w/920 sxs cmt.
 9 5/8" @ 9500' w/875 sxs cmt. 5 1/2" @ 15540' w/705 sxs cmt.

Attachments: Revised Directional Plan + C-102 + proposed WBD.

NM OIL CONSERVATION
 ARTESIA DISTRICT

Spud Date:

Rig Release Date:

DEC 27 2017

RECEIVED

I hereby certify that the information above is true and complete to the best of my knowledge and belief.

SIGNATURE: Jan Valkenburg TITLE Mgr., Regulatory Compliance DATE 12/21/17

Type or print name Charlotte Van Valkenburg E-mail address: Charlotv@kfoc.net PHONE: 918-499-4314

For State Use Only

APPROVED BY: Raymond H. Polansky TITLE Geologist DATE 12-28-17

Conditions of Approval (if any):

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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
copy to appropriate
District Office

ARTESIA DISTRICT
DEC 27 2017 AMENDED REPORT

RECEIVED

WELL LOCATION AND ACREAGE DEDICATION PLAT

1 API Number 30-015-43990		2 Pool Code 98220		3 Pool Name Purple Sage - Wolfcamp Gas	
4 Property Code 317154		5 Property Name WILLOW LAKE WC 15			6 Well Number 1H
7 OGRID No. 12361		8 Operator Name KAISER-FRANCIS OIL COMPANY			9 Elevation 2995.1

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
L	14	24 S	28 E		2030	SOUTH	220	WEST	EDDY

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
L	15	24 S	28 E		2250	SOUTH	330	WEST	EDDY

12 Dedicated Acres 320	13 Joint or Infill	14 Consolidation Code	15 Order No.
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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.

NOTE:
LATITUDE AND LONGITUDE COORDINATES ARE SHOWN USING THE NORTH AMERICAN DATUM OF 1987 (NAD87). LISTED NEW MEXICO STATE PLANE EAST COORDINATES ARE GRID (NAD27). BASIS OF BEARING AND DISTANCES USED ARE NEW MEXICO STATE PLANE EAST (NAD83). COORDINATES ADJUSTED TO THE SURFACE. ELEVATION VALUES ARE MVD 88.

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.

Charlotte Van Valkenburg
Signature
12/21/11
Date

Charlotte Van Valkenburg
Printed Name

Charlotv@kfoc.net
E-mail Address

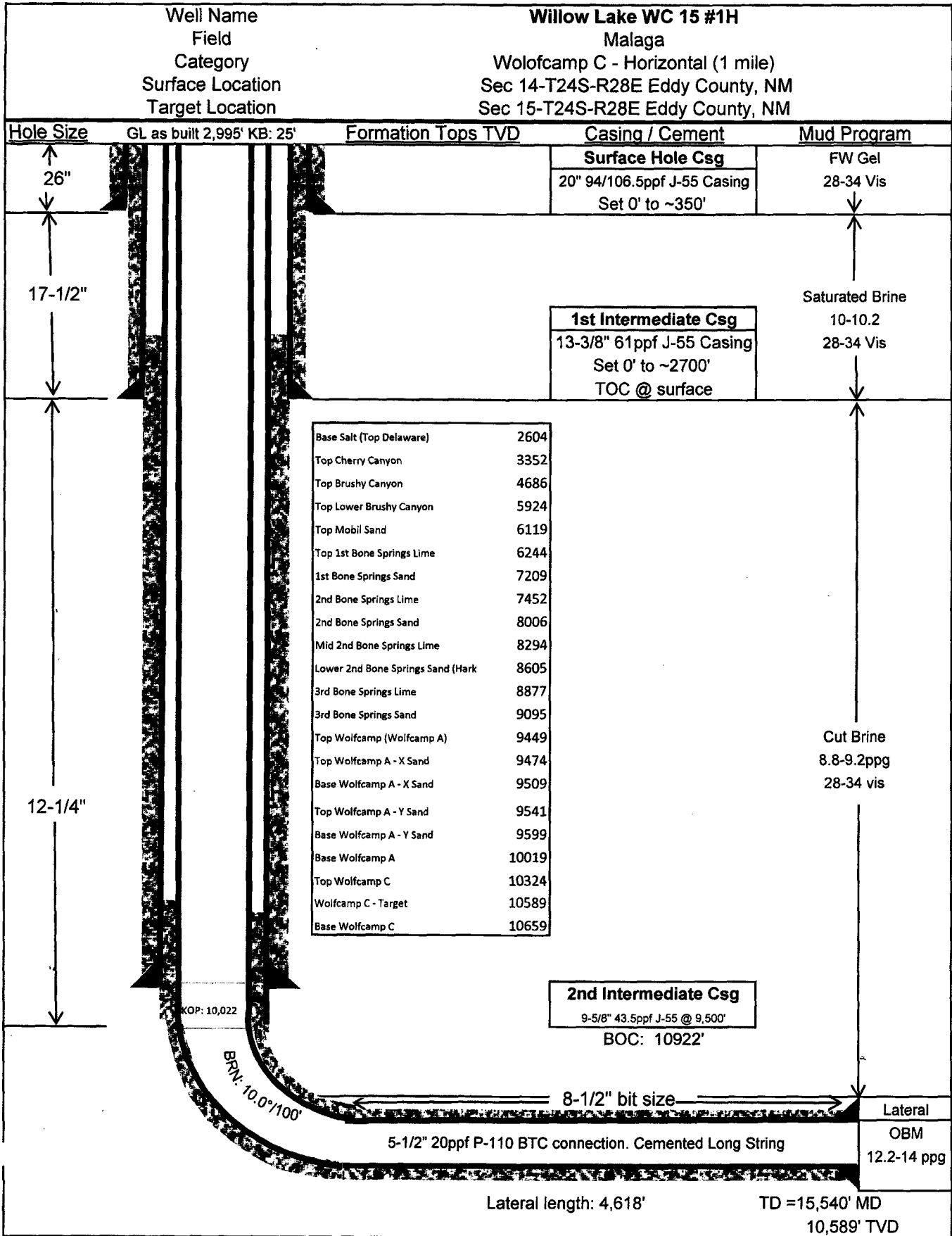
18 SURVEYOR CERTIFICATION

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.

NOVEMBER 8 2011
Date of Survey

FILMON F. JARAMILLO
Signature and Seal of Professional Surveyor

Certificate Number: FILMON F. JARAMILLO, PLS 12797
SURVEY NO. 5718



KAISER-FRANCIS OIL COMPANY

Kaiser-Francis Oil Company

**Eddy County, NM (NAD 27 NME
(WILLOW LAKE)SEC 14_T-24-S_R-28-E
Willow Lake WC 15 #1H**

OWB

Plan: Plan #1

Standard Planning Report

19 December, 2017



Database: EDM 10_13
Company: Kaiser-Francis Oil Company
Project: Eddy County, NM (NAD 27 NME)
Site: (WILLOW LAKE)SEC 14_T-24-S_R-28-E
Well: Willow Lake WC 15 #1H
Wellbore: OWB
Design: Plan #1

Local Co-ordinate Reference: Well Willow Lake WC 15 #1H
TVD Reference: KB @ 3020.0usft
MD Reference: KB @ 3020.0usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature

Project	Eddy County, NM (NAD 27 NME)		
Map System:	US State Plane 1927 (Exact solution)	System Datum:	Mean Sea Level
Geo Datum:	NAD 1927 (NADCON CONUS)		
Map Zone:	New Mexico East 3001		

Site (WILLOW LAKE)SEC 14_T-24-S_R-28-E

Site Position: **From:** Map **Northing:** 442,504.29 usft **Latitude:** 32° 12' 58.602 N
Easting: 582,722.59 usft **Longitude:** 104° 3' 57.069 W
Position Uncertainty: 0.0 usft **Slot Radius:** 13-3/16 " **Grid Convergence:** 0.14 °

Well Willow Lake WC 15 #1H

Well Position **+N-S** -30.0 usft **Northing:** 442,474.27 usft **Latitude:** 32° 12' 58.305 N
+E-W 0.0 usft **Easting:** 582,722.55 usft **Longitude:** 104° 3' 57.070 W
Position Uncertainty 0.0 usft **Wellhead Elevation:** 0.0 usft **Ground Level:** 2,995.0 usft

Wellbore OWB

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	12/19/17	7.13	59.97	47,832

Design Plan #1

Audit Notes:

Version: **Phase:** PLAN **Tie On Depth:** 0.0

Vertical Section: **Depth From (TVD) (usft)** **+N-S (usft)** **+E-W (usft)** **Direction (°)**
 0.0 0.0 0.0 272.64

Plan Sections

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N-S (usft)	+E-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	
4,500.0	0.00	0.00	4,500.0	0.0	0.0	0.00	0.00	0.00	0.00	
4,650.4	3.01	5.94	4,650.3	3.9	0.4	2.00	2.00	0.00	5.94	
8,755.4	3.01	5.94	8,749.7	218.1	22.7	0.00	0.00	0.00	0.00	
8,905.8	0.00	0.00	8,900.0	222.0	23.1	2.00	-2.00	0.00	180.00	
10,021.8	0.00	0.00	10,016.0	222.0	23.1	0.00	0.00	0.00	0.00	KOP (Willow Lake \
10,921.8	90.00	270.18	10,589.0	223.8	-549.8	10.00	10.00	-9.98	270.18	
15,540.0	90.00	270.18	10,589.0	238.2	-5,168.0	0.00	0.00	0.00	0.00	LTP (Willow Lake V

Planning Report



Database: EDM 10_13
 Company: Kaiser-Francis Oil Company
 Project: Eddy County, NM (NAD 27 NME
 Site: (WILLOW LAKE)SEC 14_T-24-S_R-28-E
 Well: Willow Lake WC 15 #1H
 Wellbore: OWB
 Design: Plan #1

Local Co-ordinate Reference: Well Willow Lake WC 15 #1H
 TVD Reference: KB @ 3020.0usft
 MD Reference: KB @ 3020.0usft
 North Reference: Grid
 Survey Calculation Method: Minimum Curvature

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00
100.0	0.00	0.00	100.0	0.0	0.0	0.0	0.00	0.00	0.00
200.0	0.00	0.00	200.0	0.0	0.0	0.0	0.00	0.00	0.00
300.0	0.00	0.00	300.0	0.0	0.0	0.0	0.00	0.00	0.00
400.0	0.00	0.00	400.0	0.0	0.0	0.0	0.00	0.00	0.00
500.0	0.00	0.00	500.0	0.0	0.0	0.0	0.00	0.00	0.00
600.0	0.00	0.00	600.0	0.0	0.0	0.0	0.00	0.00	0.00
700.0	0.00	0.00	700.0	0.0	0.0	0.0	0.00	0.00	0.00
800.0	0.00	0.00	800.0	0.0	0.0	0.0	0.00	0.00	0.00
900.0	0.00	0.00	900.0	0.0	0.0	0.0	0.00	0.00	0.00
1,000.0	0.00	0.00	1,000.0	0.0	0.0	0.0	0.00	0.00	0.00
1,100.0	0.00	0.00	1,100.0	0.0	0.0	0.0	0.00	0.00	0.00
1,200.0	0.00	0.00	1,200.0	0.0	0.0	0.0	0.00	0.00	0.00
1,300.0	0.00	0.00	1,300.0	0.0	0.0	0.0	0.00	0.00	0.00
1,400.0	0.00	0.00	1,400.0	0.0	0.0	0.0	0.00	0.00	0.00
1,500.0	0.00	0.00	1,500.0	0.0	0.0	0.0	0.00	0.00	0.00
1,600.0	0.00	0.00	1,600.0	0.0	0.0	0.0	0.00	0.00	0.00
1,700.0	0.00	0.00	1,700.0	0.0	0.0	0.0	0.00	0.00	0.00
1,800.0	0.00	0.00	1,800.0	0.0	0.0	0.0	0.00	0.00	0.00
1,900.0	0.00	0.00	1,900.0	0.0	0.0	0.0	0.00	0.00	0.00
2,000.0	0.00	0.00	2,000.0	0.0	0.0	0.0	0.00	0.00	0.00
2,100.0	0.00	0.00	2,100.0	0.0	0.0	0.0	0.00	0.00	0.00
2,200.0	0.00	0.00	2,200.0	0.0	0.0	0.0	0.00	0.00	0.00
2,300.0	0.00	0.00	2,300.0	0.0	0.0	0.0	0.00	0.00	0.00
2,400.0	0.00	0.00	2,400.0	0.0	0.0	0.0	0.00	0.00	0.00
2,500.0	0.00	0.00	2,500.0	0.0	0.0	0.0	0.00	0.00	0.00
2,600.0	0.00	0.00	2,600.0	0.0	0.0	0.0	0.00	0.00	0.00
2,605.0	0.00	0.00	2,605.0	0.0	0.0	0.0	0.00	0.00	0.00
Base Salt (Top Delaware)									
2,700.0	0.00	0.00	2,700.0	0.0	0.0	0.0	0.00	0.00	0.00
2,800.0	0.00	0.00	2,800.0	0.0	0.0	0.0	0.00	0.00	0.00
2,900.0	0.00	0.00	2,900.0	0.0	0.0	0.0	0.00	0.00	0.00
3,000.0	0.00	0.00	3,000.0	0.0	0.0	0.0	0.00	0.00	0.00
3,100.0	0.00	0.00	3,100.0	0.0	0.0	0.0	0.00	0.00	0.00
3,200.0	0.00	0.00	3,200.0	0.0	0.0	0.0	0.00	0.00	0.00
3,300.0	0.00	0.00	3,300.0	0.0	0.0	0.0	0.00	0.00	0.00
3,353.0	0.00	0.00	3,353.0	0.0	0.0	0.0	0.00	0.00	0.00
Top Cherry Canyon									
3,400.0	0.00	0.00	3,400.0	0.0	0.0	0.0	0.00	0.00	0.00
3,500.0	0.00	0.00	3,500.0	0.0	0.0	0.0	0.00	0.00	0.00
3,600.0	0.00	0.00	3,600.0	0.0	0.0	0.0	0.00	0.00	0.00
3,700.0	0.00	0.00	3,700.0	0.0	0.0	0.0	0.00	0.00	0.00
3,800.0	0.00	0.00	3,800.0	0.0	0.0	0.0	0.00	0.00	0.00
3,900.0	0.00	0.00	3,900.0	0.0	0.0	0.0	0.00	0.00	0.00
4,000.0	0.00	0.00	4,000.0	0.0	0.0	0.0	0.00	0.00	0.00
4,100.0	0.00	0.00	4,100.0	0.0	0.0	0.0	0.00	0.00	0.00
4,200.0	0.00	0.00	4,200.0	0.0	0.0	0.0	0.00	0.00	0.00
4,300.0	0.00	0.00	4,300.0	0.0	0.0	0.0	0.00	0.00	0.00
4,400.0	0.00	0.00	4,400.0	0.0	0.0	0.0	0.00	0.00	0.00
4,500.0	0.00	0.00	4,500.0	0.0	0.0	0.0	0.00	0.00	0.00
NUDGE - Build 2.00									
4,600.0	2.00	5.94	4,600.0	1.7	0.2	-0.1	2.00	2.00	0.00
4,650.4	3.01	5.94	4,650.3	3.9	0.4	-0.2	2.00	2.00	0.00
HOLD - 4105.1 hold at 4650.4 MD									

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Wellbore: OWB
Design: Plan #1

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TVD Reference: KB @ 3020.0usft
MD Reference: KB @ 3020.0usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
4,687.1	3.01	5.94	4,687.0	5.8	0.6	-0.3	0.00	0.00	0.00
Top Brushy Canyon									
4,700.0	3.01	5.94	4,699.9	6.5	0.7	-0.4	0.00	0.00	0.00
4,800.0	3.01	5.94	4,799.7	11.7	1.2	-0.7	0.00	0.00	0.00
4,900.0	3.01	5.94	4,899.6	16.9	1.8	-1.0	0.00	0.00	0.00
5,000.0	3.01	5.94	4,999.4	22.2	2.3	-1.3	0.00	0.00	0.00
5,100.0	3.01	5.94	5,099.3	27.4	2.9	-1.6	0.00	0.00	0.00
5,200.0	3.01	5.94	5,199.2	32.6	3.4	-1.9	0.00	0.00	0.00
5,300.0	3.01	5.94	5,299.0	37.8	3.9	-2.2	0.00	0.00	0.00
5,400.0	3.01	5.94	5,398.9	43.0	4.5	-2.5	0.00	0.00	0.00
5,500.0	3.01	5.94	5,498.8	48.3	5.0	-2.8	0.00	0.00	0.00
5,600.0	3.01	5.94	5,598.6	53.5	5.6	-3.1	0.00	0.00	0.00
5,700.0	3.01	5.94	5,698.5	58.7	6.1	-3.4	0.00	0.00	0.00
5,800.0	3.01	5.94	5,798.3	63.9	6.7	-3.7	0.00	0.00	0.00
5,900.0	3.01	5.94	5,898.2	69.1	7.2	-4.0	0.00	0.00	0.00
5,926.8	3.01	5.94	5,925.0	70.5	7.3	-4.1	0.00	0.00	0.00
Top Lower Brushy Canyon									
6,000.0	3.01	5.94	5,998.1	74.3	7.7	-4.3	0.00	0.00	0.00
6,100.0	3.01	5.94	6,097.9	79.6	8.3	-4.6	0.00	0.00	0.00
6,122.1	3.01	5.94	6,120.0	80.7	8.4	-4.7	0.00	0.00	0.00
Top Mobil Sand									
6,200.0	3.01	5.94	6,197.8	84.8	8.8	-4.9	0.00	0.00	0.00
6,247.3	3.01	5.94	6,245.0	87.2	9.1	-5.1	0.00	0.00	0.00
Top 1st Bone Springs Lime									
6,300.0	3.01	5.94	6,297.7	90.0	9.4	-5.2	0.00	0.00	0.00
6,400.0	3.01	5.94	6,397.5	95.2	9.9	-5.5	0.00	0.00	0.00
6,500.0	3.01	5.94	6,497.4	100.4	10.5	-5.8	0.00	0.00	0.00
6,600.0	3.01	5.94	6,597.2	105.7	11.0	-6.1	0.00	0.00	0.00
6,700.0	3.01	5.94	6,697.1	110.9	11.5	-6.4	0.00	0.00	0.00
6,800.0	3.01	5.94	6,797.0	116.1	12.1	-6.7	0.00	0.00	0.00
6,900.0	3.01	5.94	6,896.8	121.3	12.6	-7.0	0.00	0.00	0.00
7,000.0	3.01	5.94	6,996.7	126.5	13.2	-7.3	0.00	0.00	0.00
7,100.0	3.01	5.94	7,096.6	131.7	13.7	-7.6	0.00	0.00	0.00
7,200.0	3.01	5.94	7,196.4	137.0	14.3	-7.9	0.00	0.00	0.00
7,213.6	3.01	5.94	7,210.0	137.7	14.3	-8.0	0.00	0.00	0.00
1st Bone Springs Sand									
7,300.0	3.01	5.94	7,296.3	142.2	14.8	-8.2	0.00	0.00	0.00
7,400.0	3.01	5.94	7,396.1	147.4	15.3	-8.5	0.00	0.00	0.00
7,456.9	3.01	5.94	7,453.0	150.4	15.7	-8.7	0.00	0.00	0.00
2nd Bone Springs Lime									
7,500.0	3.01	5.94	7,496.0	152.6	15.9	-8.8	0.00	0.00	0.00
7,600.0	3.01	5.94	7,595.9	157.8	16.4	-9.1	0.00	0.00	0.00
7,700.0	3.01	5.94	7,695.7	163.0	17.0	-9.4	0.00	0.00	0.00
7,800.0	3.01	5.94	7,795.6	168.3	17.5	-9.7	0.00	0.00	0.00
7,900.0	3.01	5.94	7,895.5	173.5	18.1	-10.1	0.00	0.00	0.00
8,000.0	3.01	5.94	7,995.3	178.7	18.6	-10.4	0.00	0.00	0.00
8,011.7	3.01	5.94	8,007.0	179.3	18.7	-10.4	0.00	0.00	0.00
2nd Bone Springs Sand									
8,100.0	3.01	5.94	8,095.2	183.9	19.1	-10.7	0.00	0.00	0.00
8,200.0	3.01	5.94	8,195.0	189.1	19.7	-11.0	0.00	0.00	0.00
8,300.0	3.01	5.94	8,294.9	194.4	20.2	-11.3	0.00	0.00	0.00
8,300.1	3.01	5.94	8,295.0	194.4	20.2	-11.3	0.00	0.00	0.00
Mid 2nd Bone Springs Lime									

Database: EDM 10_13
Company: Kaiser-Francis Oil Company
Project: Eddy County, NM (NAD 27 NME
(WILLOW LAKE)SEC 14_T-24-S_R-28-E
Site:
Well: Willow Lake WC 15 #1H
Wellbore: OWB
Design: Plan #1

Local Co-ordinate Reference: Well Willow Lake WC 15 #1H
TVD Reference: KB @ 3020.0usft
MD Reference: KB @ 3020.0usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
8,400.0	3.01	5.94	8,394.8	199.6	20.8	-11.6	0.00	0.00	0.00
8,500.0	3.01	5.94	8,494.6	204.8	21.3	-11.9	0.00	0.00	0.00
8,600.0	3.01	5.94	8,594.5	210.0	21.9	-12.2	0.00	0.00	0.00
8,611.5	3.01	5.94	8,606.0	210.6	21.9	-12.2	0.00	0.00	0.00
Lower 2nd Bone Springs Sand (Harkey)									
8,700.0	3.01	5.94	8,694.4	215.2	22.4	-12.5	0.00	0.00	0.00
8,755.4	3.01	5.94	8,749.7	218.1	22.7	-12.6	0.00	0.00	0.00
DROP - -2.00									
8,800.0	2.12	5.94	8,794.2	220.1	22.9	-12.8	2.00	-2.00	0.00
8,883.8	0.44	5.94	8,878.0	222.0	23.1	-12.9	2.00	-2.00	0.00
3rd Bone Springs Lime									
8,905.8	0.00	0.00	8,900.0	222.0	23.1	-12.9	2.00	-2.00	0.00
HOLD - 1116.0 at 8905.8 MD									
9,000.0	0.00	0.00	8,994.2	222.0	23.1	-12.9	0.00	0.00	0.00
9,100.0	0.00	0.00	9,094.2	222.0	23.1	-12.9	0.00	0.00	0.00
9,101.8	0.00	0.00	9,096.0	222.0	23.1	-12.9	0.00	0.00	0.00
3rd Bone Springs Sand									
9,169.4	0.00	0.00	9,163.6	222.0	23.1	-12.9	0.00	0.00	0.00
KOP (Willow Lake WA 15 #1H)									
9,200.0	0.00	0.00	9,194.2	222.0	23.1	-12.9	0.00	0.00	0.00
9,300.0	0.00	0.00	9,294.2	222.0	23.1	-12.9	0.00	0.00	0.00
9,400.0	0.00	0.00	9,394.2	222.0	23.1	-12.9	0.00	0.00	0.00
9,455.8	0.00	0.00	9,450.0	222.0	23.1	-12.9	0.00	0.00	0.00
Top Wolfcamp (Wolfcamp A)									
9,480.8	0.00	0.00	9,475.0	222.0	23.1	-12.9	0.00	0.00	0.00
Top Wolfcamp A - X Sand									
9,500.0	0.00	0.00	9,494.2	222.0	23.1	-12.9	0.00	0.00	0.00
9,515.8	0.00	0.00	9,510.0	222.0	23.1	-12.9	0.00	0.00	0.00
Base Wolfcamp A - X Sand									
9,547.8	0.00	0.00	9,542.0	222.0	23.1	-12.9	0.00	0.00	0.00
Top Wolfcamp A - Y Sand									
9,600.0	0.00	0.00	9,594.2	222.0	23.1	-12.9	0.00	0.00	0.00
9,605.8	0.00	0.00	9,600.0	222.0	23.1	-12.9	0.00	0.00	0.00
Base Wolfcamp A - Y Sand									
9,700.0	0.00	0.00	9,694.2	222.0	23.1	-12.9	0.00	0.00	0.00
9,742.8	0.00	0.00	9,737.0	222.0	23.1	-12.9	0.00	0.00	0.00
FTP (Willow Lake WA 15 #1H)									
9,800.0	0.00	0.00	9,794.2	222.0	23.1	-12.9	0.00	0.00	0.00
9,900.0	0.00	0.00	9,894.2	222.0	23.1	-12.9	0.00	0.00	0.00
10,000.0	0.00	0.00	9,994.2	222.0	23.1	-12.9	0.00	0.00	0.00
10,021.8	0.00	0.00	10,016.0	222.0	23.1	-12.9	0.00	0.00	0.00
KOP - DLS 10.00 TFO 270.18 - KOP (Willow Lake WC 15 #1H)									
10,025.8	0.40	270.18	10,020.0	222.0	23.1	-12.9	10.00	10.00	0.00
Base Wolfcamp A									
10,050.0	2.82	270.18	10,044.2	222.0	22.4	-12.2	10.00	10.00	0.00
10,100.0	7.82	270.18	10,094.0	222.1	17.8	-7.5	10.00	10.00	0.00
10,150.0	12.82	270.18	10,143.1	222.1	8.8	1.4	10.00	10.00	0.00
10,200.0	17.82	270.18	10,191.3	222.1	-4.4	14.6	10.00	10.00	0.00
10,250.0	22.82	270.18	10,238.2	222.2	-21.7	31.9	10.00	10.00	0.00
10,300.0	27.82	270.18	10,283.4	222.3	-43.1	53.3	10.00	10.00	0.00
10,348.2	32.64	270.18	10,325.0	222.3	-67.4	77.5	10.00	10.00	0.00
Top Wolfcamp C									

Planning Report



Database: EDM 10_13
 Company: Kaiser-Francis Oil Company
 Project: Eddy County, NM (NAD 27 NME
 Site: (WILLOW LAKE)SEC 14_T-24-S_R-28-E
 Well: Willow Lake WC 15 #1H
 Wellbore: OWB
 Design: Plan #1

Local Co-ordinate Reference: Well Willow Lake WC 15 #1H
 TVD Reference: KB @ 3020.0usft
 MD Reference: KB @ 3020.0usft
 North Reference: Grid
 Survey Calculation Method: Minimum Curvature

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
10,350.0	32.82	270.18	10,326.6	222.3	-68.3	78.5	10.00	10.00	0.00
10,400.0	37.82	270.18	10,367.3	222.4	-97.2	107.4	10.00	10.00	0.00
10,450.0	42.82	270.18	10,405.4	222.5	-129.6	139.7	10.00	10.00	0.00
10,500.0	47.82	270.18	10,440.6	222.6	-165.1	175.2	10.00	10.00	0.00
10,550.0	52.82	270.18	10,472.5	222.8	-203.6	213.6	10.00	10.00	0.00
10,600.0	57.82	270.18	10,500.9	222.9	-244.7	254.7	10.00	10.00	0.00
10,650.0	62.82	270.18	10,525.7	223.0	-288.1	298.1	10.00	10.00	0.00
10,700.0	67.82	270.18	10,546.6	223.2	-333.5	343.5	10.00	10.00	0.00
10,750.0	72.82	270.18	10,563.4	223.3	-380.6	390.5	10.00	10.00	0.00
10,800.0	77.82	270.18	10,576.1	223.5	-429.0	438.8	10.00	10.00	0.00
10,850.0	82.82	270.18	10,584.5	223.6	-478.2	488.0	10.00	10.00	0.00
10,900.0	87.82	270.18	10,588.5	223.8	-528.1	537.8	10.00	10.00	0.00
10,921.8	90.00	270.18	10,589.0	223.8	-549.8	559.6	9.99	9.99	0.00
EOC/FTP - Start 4618.2 hold at 10921.8 MD - FTP (Willow Lake WC 15 #1H)									
11,000.0	90.00	270.18	10,589.0	224.1	-628.0	637.7	0.00	0.00	0.00
11,100.0	90.00	270.18	10,589.0	224.4	-728.0	737.6	0.00	0.00	0.00
11,200.0	90.00	270.18	10,589.0	224.7	-828.0	837.5	0.00	0.00	0.00
11,300.0	90.00	270.18	10,589.0	225.0	-928.0	937.4	0.00	0.00	0.00
11,400.0	90.00	270.18	10,589.0	225.3	-1,028.0	1,037.3	0.00	0.00	0.00
11,500.0	90.00	270.18	10,589.0	225.6	-1,128.0	1,137.2	0.00	0.00	0.00
11,600.0	90.00	270.18	10,589.0	225.9	-1,228.0	1,237.1	0.00	0.00	0.00
11,700.0	90.00	270.18	10,589.0	226.3	-1,328.0	1,337.1	0.00	0.00	0.00
11,800.0	90.00	270.18	10,589.0	226.6	-1,428.0	1,437.0	0.00	0.00	0.00
11,900.0	90.00	270.18	10,589.0	226.9	-1,528.0	1,536.9	0.00	0.00	0.00
12,000.0	90.00	270.18	10,589.0	227.2	-1,628.0	1,636.8	0.00	0.00	0.00
12,100.0	90.00	270.18	10,589.0	227.5	-1,728.0	1,736.7	0.00	0.00	0.00
12,200.0	90.00	270.18	10,589.0	227.8	-1,828.0	1,836.6	0.00	0.00	0.00
12,300.0	90.00	270.18	10,589.0	228.1	-1,928.0	1,936.5	0.00	0.00	0.00
12,400.0	90.00	270.18	10,589.0	228.4	-2,028.0	2,036.4	0.00	0.00	0.00
12,500.0	90.00	270.18	10,589.0	228.8	-2,128.0	2,136.3	0.00	0.00	0.00
12,600.0	90.00	270.18	10,589.0	229.1	-2,228.0	2,236.2	0.00	0.00	0.00
12,700.0	90.00	270.18	10,589.0	229.4	-2,328.0	2,336.1	0.00	0.00	0.00
12,800.0	90.00	270.18	10,589.0	229.7	-2,428.0	2,436.0	0.00	0.00	0.00
12,900.0	90.00	270.18	10,589.0	230.0	-2,528.0	2,536.0	0.00	0.00	0.00
13,000.0	90.00	270.18	10,589.0	230.3	-2,628.0	2,635.9	0.00	0.00	0.00
13,100.0	90.00	270.18	10,589.0	230.6	-2,728.0	2,735.8	0.00	0.00	0.00
13,200.0	90.00	270.18	10,589.0	230.9	-2,828.0	2,835.7	0.00	0.00	0.00
13,221.7	90.00	270.18	10,589.0	231.0	-2,849.7	2,857.4	0.00	0.00	0.00
QTR SEC LN @ 13221.7' MD									
13,300.0	90.00	270.18	10,589.0	231.3	-2,928.0	2,935.6	0.00	0.00	0.00
13,400.0	90.00	270.18	10,589.0	231.6	-3,028.0	3,035.5	0.00	0.00	0.00
13,500.0	90.00	270.18	10,589.0	231.9	-3,128.0	3,135.4	0.00	0.00	0.00
13,600.0	90.00	270.18	10,589.0	232.2	-3,228.0	3,235.3	0.00	0.00	0.00
13,700.0	90.00	270.18	10,589.0	232.5	-3,328.0	3,335.2	0.00	0.00	0.00
13,800.0	90.00	270.18	10,589.0	232.8	-3,428.0	3,435.1	0.00	0.00	0.00
13,900.0	90.00	270.18	10,589.0	233.1	-3,528.0	3,535.0	0.00	0.00	0.00
14,000.0	90.00	270.18	10,589.0	233.4	-3,628.0	3,634.9	0.00	0.00	0.00
14,100.0	90.00	270.18	10,589.0	233.8	-3,728.0	3,734.8	0.00	0.00	0.00
14,200.0	90.00	270.18	10,589.0	234.1	-3,828.0	3,834.8	0.00	0.00	0.00
14,300.0	90.00	270.18	10,589.0	234.4	-3,928.0	3,934.7	0.00	0.00	0.00
14,400.0	90.00	270.18	10,589.0	234.7	-4,028.0	4,034.6	0.00	0.00	0.00
14,500.0	90.00	270.18	10,589.0	235.0	-4,128.0	4,134.5	0.00	0.00	0.00
14,600.0	90.00	270.18	10,589.0	235.3	-4,228.0	4,234.4	0.00	0.00	0.00
14,700.0	90.00	270.18	10,589.0	235.6	-4,328.0	4,334.3	0.00	0.00	0.00

Database: EDM 10_13
Company: Kaiser-Francis Oil Company
Project: Eddy County, NM (NAD 27 NME
 (WILLOW LAKE)SEC 14_T-24-S_R-28-E
Site: Willow Lake WC 15 #1H
Well: Willow Lake WC 15 #1H
Wellbore: OWB
Design: Plan #1

Local Co-ordinate Reference: Well Willow Lake WC 15 #1H
TVD Reference: KB @ 3020.0usft
MD Reference: KB @ 3020.0usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
14,800.0	90.00	270.18	10,589.0	235.9	-4,428.0	4,434.2	0.00	0.00	0.00
14,900.0	90.00	270.18	10,589.0	236.3	-4,528.0	4,534.1	0.00	0.00	0.00
15,000.0	90.00	270.18	10,589.0	236.6	-4,628.0	4,634.0	0.00	0.00	0.00
15,100.0	90.00	270.18	10,589.0	236.9	-4,728.0	4,733.9	0.00	0.00	0.00
15,200.0	90.00	270.18	10,589.0	237.2	-4,828.0	4,833.8	0.00	0.00	0.00
15,300.0	90.00	270.18	10,589.0	237.5	-4,928.0	4,933.7	0.00	0.00	0.00
15,400.0	90.00	270.18	10,589.0	237.8	-5,028.0	5,033.6	0.00	0.00	0.00
15,500.0	90.00	270.18	10,589.0	238.1	-5,128.0	5,133.6	0.00	0.00	0.00
15,540.0	90.00	270.18	10,589.0	238.2	-5,168.0	5,173.5	0.00	0.00	0.00

LTP at 15540.0 - LTP (Willow Lake WA 15 #1H) - LTP (Willow Lake WC 15 #1H)

Design Targets

Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
KOP (Willow Lake WC - hit/miss target - Shape - Point	0.00	0.00	10,016.0	222.0	23.1	442,696.31	582,745.67	32° 13' 0.502 N	104° 3' 56.794 W
FTP (Willow Lake WC - plan hits target center - Point	0.00	0.00	10,589.0	223.8	-549.8	442,698.08	582,172.70	32° 13' 0.534 N	104° 4' 3.464 W
LTP (Willow Lake WC - plan hits target center - Rectangle (sides W60.0 H4,614.8 D20.0)	0.00	90.18	10,589.0	238.2	-5,168.0	442,712.52	577,554.56	32° 13' 0.786 N	104° 4' 57.221 W

Planning Report



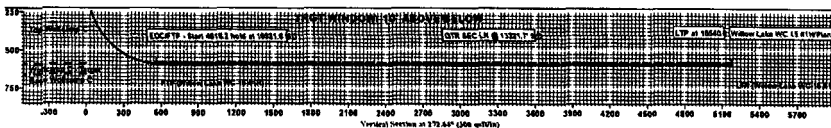
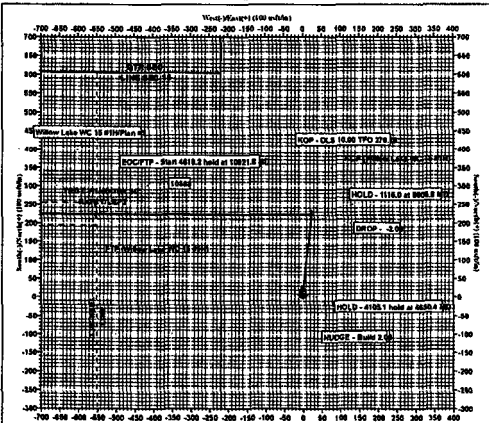
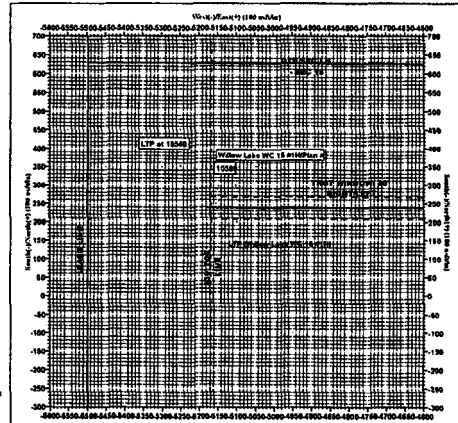
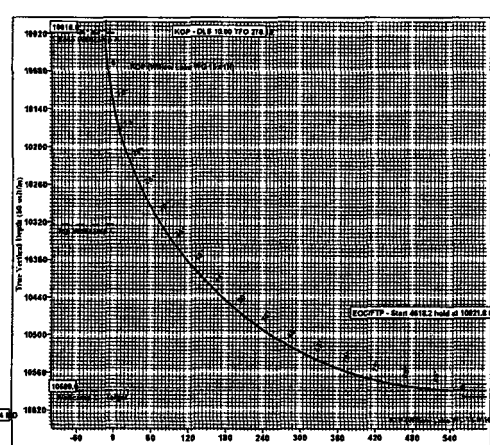
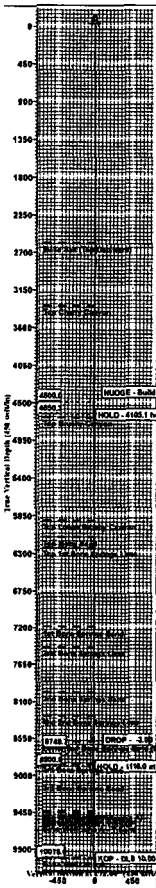
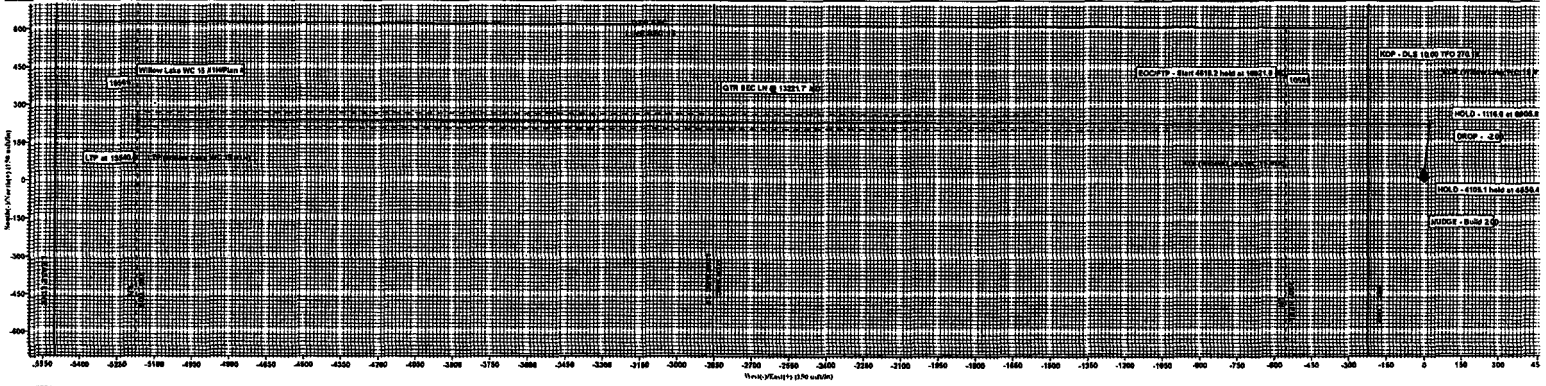
Database:	EDM 10_13	Local Co-ordinate Reference:	Well Willow Lake WC 15 #1H
Company:	Kaiser-Francis Oil Company	TVD Reference:	KB @ 3020.0usft
Project:	Eddy County, NM (NAD 27 NME	MD Reference:	KB @ 3020.0usft
Site:	(WILLOW LAKE)SEC 14_T-24-S_R-28-E	North Reference:	Grid
Well:	Willow Lake WC 15 #1H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OWB		
Design:	Plan #1		

Formations

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
2,605.0	2,605.0	Base Salt (Top Delaware)		0.00	
3,353.0	3,353.0	Top Cherry Canyon		0.00	
4,687.1	4,687.0	Top Brushy Canyon		0.00	
5,926.8	5,925.0	Top Lower Brushy Canyon		0.00	
6,122.1	6,120.0	Top Mobil Sand		0.00	
6,247.3	6,245.0	Top 1st Bone Springs Lime		0.00	
7,213.6	7,210.0	1st Bone Springs Sand		0.00	
7,456.9	7,453.0	2nd Bone Springs Lime		0.00	
8,011.7	8,007.0	2nd Bone Springs Sand		0.00	
8,300.1	8,295.0	Mid 2nd Bone Springs Lime		0.00	
8,611.5	8,606.0	Lower 2nd Bone Springs Sand (Harl		0.00	
8,883.8	8,878.0	3rd Bone Springs Lime		0.00	
9,101.8	9,096.0	3rd Bone Springs Sand		0.00	
9,455.8	9,450.0	Top Wolfcamp (Wolfcamp A)		0.00	
9,480.8	9,475.0	Top Wolfcamp A - X Sand		0.00	
9,515.8	9,510.0	Base Wolfcamp A - X Sand		0.00	
9,547.8	9,542.0	Top Wolfcamp A - Y Sand		0.00	
9,605.8	9,600.0	Base Wolfcamp A - Y Sand		0.00	
10,025.8	10,020.0	Base Wolfcamp A		0.00	
10,348.2	10,325.0	Top Wolfcamp C		0.00	

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
4,500.0	4,500.0	0.0	0.0	NUDGE - Build 2.00
4,650.4	4,650.3	3.9	0.4	HOLD - 4105.1 hold at 4650.4 MD
8,755.4	8,749.7	218.1	22.7	DROP - -2.00
8,905.8	8,900.0	222.0	23.1	HOLD - 1116.0 at 8905.8 MD
10,021.8	10,016.0	222.0	23.1	KOP - DLS 10.00 TFO 270.18
10,921.8	10,589.0	223.8	-549.8	EOC/FTP - Start 4618.2 hold at 10921.8 MD
13,221.7	10,589.0	231.0	-2,849.7	QTR SEC LN @ 13221.7' MD
15,540.0	10,589.0	238.2	-5,168.0	LTP at 15540.0



WELL DETAILS: Willow Lake WC 15 #1H

Ground Level: 2986.0	
+N/-S 0.0	+E/-W 0.0
Northing 442474.27	Latitude 32° 12' 58.305 N
Easting 682722.05	Longitude 104° 3' 57.070 W

SECTION DETAILS

MD	Inc	Azi	TVD	+N/-S	+E/-W	Diag TFace	VBeet	Annotation
0.0	0.00	6.00	0.0	0.0	0.0	0.00	0.00	
4850.0	0.00	0.00	4850.0	0.0	0.0	0.00	0.00	NUDGE - Build 2.00
4850.4	3.01	5.84	4863.3	5.8	0.4	2.00	6.84	HOLD - 4105.1 hold at 4850.4 MD
8786.4	3.01	5.84	8748.7	218.1	22.7	0.00	0.00	DROP - 2.00
8906.8	0.00	0.00	8906.8	222.0	23.1	2.00	180.00	HOLD - 1116.0 at 8906.8 MD
10021.8	0.00	0.00	10021.8	223.0	23.1	0.00	0.00	KOP - DL 10.00 TPO 270.18
10921.8	90.00	270.18	10921.8	223.8	-448.9	10.00	270.18	ROCFITP - Start 4619.2 hold at 10921.8 MD
16540.0	90.00	270.18	16540.0	228.3	-5188.0	0.00	0.00	LTP at 16540.0

DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting
KOP (Willow Lake WC 15 #1H)	10018.0	222.0	23.1	442626.37	682748.06
FTF (Willow Lake WC 15 #1H)	10989.0	223.8	-448.9	442638.08	682172.70
LTP (Willow Lake WC 15 #1H)	10889.0	228.3	-5188.0	442712.62	677864.06

FORMATION TOP DETAILS

TVDPPath	MDPath	Formation
2005.0	2005.0	Base Salt (Top Detectors)
3883.0	3883.0	Top Cherry Canyon
4887.0	4887.0	Top Brushy Canyon
8928.0	8928.0	Top Lower Brushy Canyon
8120.0	8122.1	Top Mobil Sand
6244.0	6247.3	Top 1st Bone Springs Line
7710.0	7713.6	1st Bone Springs Sand
7453.0	7456.9	2nd Bone Springs Line
8907.0	8911.7	2nd Bone Springs Sand
8795.0	8798.1	Mid 2nd Bone Springs Line
8406.0	8411.6	2nd Bone Springs Sand (Hanks)
8878.0	8883.8	3rd Bone Springs Line
9098.0	9101.9	3rd Bone Springs Sand
9450.0	9453.8	Top Wolfcamp (Wolfcamp A)
9478.0	9480.8	Top Wolfcamp A - X Sand
9510.0	9516.8	Base Wolfcamp A - X Sand
9542.0	9547.8	Top Wolfcamp A - Y Sand
9600.0	9608.8	Base Wolfcamp A - Y Sand
10028.0	10029.8	Base Wolfcamp A
10325.0	10348.2	Top Wolfcamp C

Azimuths to Grid North
 True North: -0.14°
 Magnetic North: 8.98°

Magnetic Field
 Strength: 47831.75nT
 Dip Angle: 59.97°
 Date: 12/19/2017
 Model: IGRF2015

To convert a Magnetic Direction to a Grid Direction, Add 8.98°

Kaiser-Francis Oil Company
 Project: Eddy County, NM (NAD 27 NME
 Site: (WILLOW LAKE) SEC 14, T-24-S, R-26-E
 Well: Willow Lake WC 15 #1H
 Wellbore: OWB
 Design: Plan #1
 Lat: 32° 12' 58.305 N
 Long: 104° 3' 57.070 W
 Pad GL: 2995.0'
 KB: KB @ 3020.0usft