



FORGE ENERGY

# SURVEY REPORT

UL 20 FLATHEAD #2H

BLUE QUAIL #11

2/17/2017



The **Ultimate Partner** In Wellbore Placement

CUSTOMER Forge Energy  
PROJECT Winkler County, Texas  
FIELD N/A

SDI JOB NO. 419028  
SDI DISTRICT Midland  
SDI KIT/UNIT

### SITE INFORMATION

Site Name Winkler County, Texas  
Lat/Long 31.7152289° N, 103.2880281° W  
Northing 757,255.13 ft  
Easting 1,081,303 ft

Section  
Township  
Range

### MAP INFORMATION

North Reference Grid North  
Grid Correction 1.52 deg  
System US State Plane 1927  
Datum North American Datum 1927 (Clarke 1866)  
Map Zone Texas Central: 4203



### WELL INFORMATION

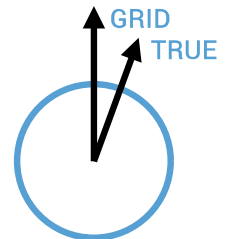
Lat/Long 31.7152289° N, 103.2880281° W  
Northing 757,255.13 ft  
Easting 1,081,303 ft  
UWI 42-495-33782

### DEPTH AND ELEVATION REFERENCE

Ground Level 2792 ft above Mean Sea Level  
Reference Datum RKB  
Reference Height 25 ft above G.L.  
Reference Elevation 2817 ft

### VERTICAL SECTION REFERENCE

+N/-S 0 ft  
+E/-W 0 ft  
Proposal Direction 259.50°  
Calculation Method Minimum Curvature



### LOCAL GRAVITY REFERENCE INFORMATION

Local Gravity 998.517 mG [computed]  
True to Grid add 1.52°

### WELL NOTES

Drop Gyro Survey

### OPERATORS

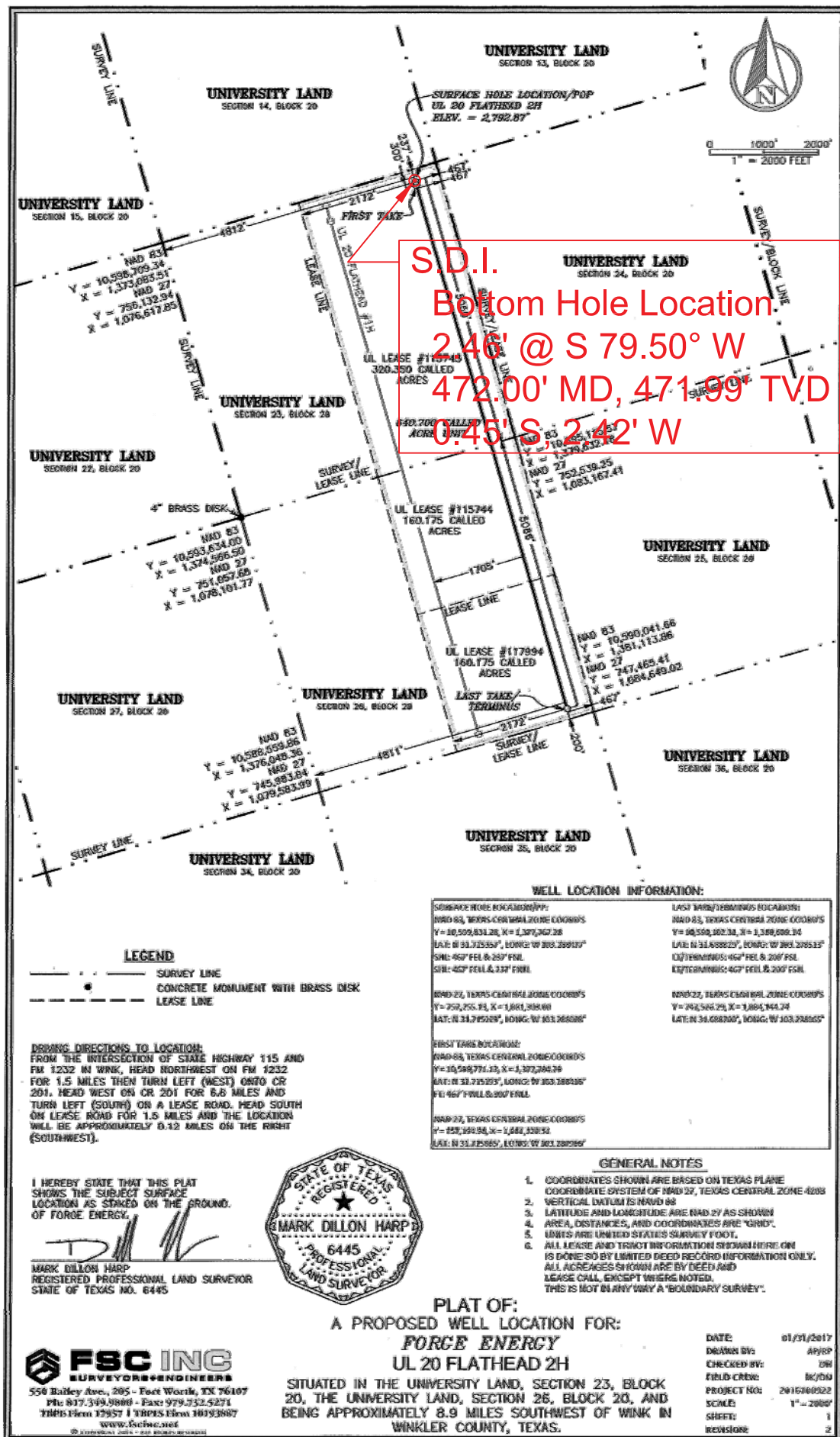
Jeffrey Loyd

SDI Operator Name (Printed)

SIGNATURE

DATE

MD	INC	AZIM	TVD	VS	+N/-S	+E/-W	DLS	CLOSURE DIST	CLOSURE DIR
ft	deg	deg	ft	ft	ft	ft	°/100ft	ft	deg
0.00	0.00	0.00	0.00	0.00	0.00	0.00	Invalid	0.00	0.00
84.00	0.07	75.49	84.00	-0.05	0.01	0.05	0.08	0.05	75.49
117.00	0.23	282.37	117.00	-0.01	0.03	0.00	0.91	0.03	7.59
210.00	0.23	222.14	210.00	0.32	-0.07	-0.31	0.25	0.32	257.69
360.00	0.62	265.35	360.00	1.37	-0.36	-1.33	0.32	1.38	254.82
390.00	0.64	256.20	389.99	1.70	-0.41	-1.65	0.34	1.70	255.96
420.00	0.52	265.90	419.99	2.00	-0.46	-1.95	0.50	2.01	256.66
450.00	0.54	273.76	449.99	2.28	-0.46	-2.23	0.24	2.28	258.25
472.00	0.44	276.20	471.99	2.46	-0.45	-2.42	0.43	2.46	259.50







Scientific Drilling International, Inc.

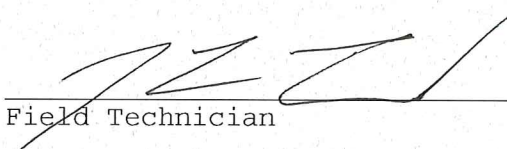
325 S. Faudree Rd. • Odessa, Texas 79761

P. O. Box 9699 • Midland, Texas 79708

Tel: 432-689-5600 • Fax: 432-697-0324

State of Texas  
County of Midland

I, Jeffrey Loyd, certify that; I am employed by Scientific Drilling International; that I did on the day(s) of 02/17/2017 through 02/17/2017 conduct or supervise the taking of a Keeper Gyro survey from a depth of 84 feet to a depth of 472 feet; that the data is true, correct, complete and within the limitations of the tool as set forth by Scientific Drilling International; that I am authorized and qualified to make this report; that this survey was conducted at the request of Forge Energy for the UL 20 Flathead #2H Well, API# 42-495-33782 in Winkler County, Texas; and that I have reviewed this report and find that it conforms to the principals and procedures as set forth by Scientific Drilling International.

  
Field Technician



**Weatherford®**

Evaluation, Drilling & Intervention  
10000 West County Rd. 116  
P.O. Box 61028  
Midland, TX USA 79711  
Tel. (432) 561-8892 Fax (432) 561-8895

RAILROAD COMMISSION OF TEXAS  
Oil & Gas Division  
P.O. Drawer 12967  
Capitol Station  
Austin, TX 78711-2967

Date: April 25, 2017

Attention: Pam Johns

Re: Forge Energy  
Well: UL 20 Flathead 2H  
RRC Lease/Gas ID No. N/A-  
UNIVERSITY LANDS., Survey A-  
Winkler County Texas

API# 42-495-33782

Enclosed, please find the survey performed on the referenced well by Precision Energy Services, Inc. (P-5 No. 676004), a Weatherford company. Other information required by your office is as follows

<u>Name &amp; Title Of Surveyor</u>	<u>Well Number</u>	<u>Surveyed Depths</u>	<u>Dates Performed</u>	<u>Type of Survey</u>
Obinna Nwachukwu MWD Supervisor	2H	612 MD 19453MD	3/18/2017 4/22/2017	Measurement While Drilling

A certified plat on which the bottom-hole location is oriented both to the surface location and to the lease lines (or unit line in case of pooling) is attached to the survey report. If any other information is required, please contact the undersigned at the letterhead address and phone number.

Sincerely,

Jonathan Leger  
MWD Ops. Coordinator

**RAILROAD COMMISSION OF TEXAS**  
**OIL & GAS DIVISION**

PERMIT TO DRILL, DEEPEN, PLUG BACK, OR RE-ENTER ON A REGULAR OR ADMINISTRATIVE EXCEPTION LOCATION

PERMIT NUMBER <b>822324</b>	DATE PERMIT ISSUED OR AMENDED <b>Feb 01, 2017</b>	DISTRICT <b>* 08</b>	
API NUMBER <b>42-495-33782</b>	FORM W-1 RECEIVED <b>Jan 20, 2017</b>	COUNTY <b>WINKLER</b>	
TYPE OF OPERATION <b>NEW DRILL</b>	WELLBORE PROFILE(S) <b>Horizontal</b>	ACRES <b>640.7</b>	
OPERATOR  <b>FORGE ENERGY, LLC</b>  <b>10999 IH 10 WEST SUITE 900</b> <b>SAN ANTONIO, TX 78230-0000</b>		<b>276868</b>	<b>NOTICE</b> This permit and any allowable assigned may be revoked if payment for fee(s) submitted to the Commission is not honored. <b>District Office Telephone No:</b> <b>(432) 684-5581</b>
LEASE NAME  <b>UL 20 FLATHEAD</b>		WELL NUMBER  <b>2H</b>	
LOCATION  <b>8.9 miles SW direction from WINK</b>		TOTAL DEPTH  <b>13000</b>	
Section, Block and/or Survey SECTION <b>◀ 23</b> BLOCK <b>◀ 20</b> ABSTRACT <b>◀</b> SURVEY <b>◀ UNIVERSITY LANDS</b>			
DISTANCE TO SURVEY LINES <b>467 ft. EAST    237 ft. NORTH</b>		DISTANCE TO NEAREST LEASE LINE <b>200 ft.</b>	
DISTANCE TO LEASE LINES <b>467 ft. EAST    237 ft. NORTH</b>		DISTANCE TO NEAREST WELL ON LEASE <b>See FIELD(s) Below</b>	
FIELD(s) and LIMITATIONS: <p align="center"><b>* SEE FIELD DISTRICT FOR REPORTING PURPOSES *</b></p>			
FIELD NAME LEASE NAME		ACRES NEAREST LEASE	DEPTH NEAREST LEASE
PHANTOM (WOLFCAMP) UL 20 FLATHEAD		640.70 200	13,000 1705
WELLBORE PROFILE(s) FOR FIELD: <b>Horizontal</b>			
<b>RESTRICTIONS:</b> This is a hydrogen sulfide field. Hydrogen Sulfide Fields with perforations must be isolated and tested per State Wide Rule 36 and a Form H-9 filed with the district office. Fields with SWR 10 authority to downhole commingle must be isolated and tested individually prior to commingling production.  Lateral: TH1 Penetration Point Location Lease Lines:            467.0 F EAST L 237.0 F NORTH L  Terminus Location BH County: WINKLER Section: 23              Block: 20                      Abstract: Survey: UNIVERSITY LANDS Lease Lines:            467.0 F EAST L 200.0 F SOUTH L Survey Lines:        467.0 F EAST L 200.0 F SOUTH L			
<b>THE FOLLOWING RESTRICTIONS APPLY TO ALL FIELDS</b>			

**RAILROAD COMMISSION OF TEXAS**  
**OIL & GAS DIVISION**

PERMIT TO DRILL, DEEPEN, PLUG BACK, OR RE-ENTER ON A REGULAR OR ADMINISTRATIVE EXCEPTION LOCATION

PERMIT NUMBER <div style="text-align: right;">822324</div>	DATE PERMIT ISSUED OR AMENDED <div style="text-align: center;">Feb 01, 2017</div>	DISTRICT <div style="text-align: center;">* 08</div>										
API NUMBER <div style="text-align: right;">42-495-33782</div>	FORM W-1 RECEIVED <div style="text-align: center;">Jan 20, 2017</div>	COUNTY <div style="text-align: center;">WINKLER</div>										
TYPE OF OPERATION <div style="text-align: center;">NEW DRILL</div>	WELLBORE PROFILE(S) <div style="text-align: center;">Horizontal</div>	ACRES <div style="text-align: center;">640.7</div>										
OPERATOR <div style="text-align: right;">276868</div> <div style="text-align: center;"> <b>FORGE ENERGY, LLC</b>  <b>10999 IH 10 WEST SUITE 900</b>  <b>SAN ANTONIO, TX 78230-0000</b> </div>		NOTICE This permit and any allowable assigned may be revoked if payment for fee(s) submitted to the Commission is not honored. <b>District Office Telephone No:</b> <div style="text-align: center;">(432) 684-5581</div>										
LEASE NAME <div style="text-align: center;">UL 20 FLATHEAD</div>		WELL NUMBER <div style="text-align: center;">2H</div>										
LOCATION <div style="text-align: center;">8.9 miles SW direction from WINK</div>		TOTAL DEPTH <div style="text-align: center;">13000</div>										
Section, Block and/or Survey <div style="display: flex; justify-content: space-between;"> <div>SECTION ◀ 23</div> <div>BLOCK ◀ 20</div> <div>ABSTRACT ◀</div> </div> <div style="display: flex; justify-content: space-between;"> <div>SURVEY ◀ UNIVERSITY LANDS</div> <div></div> </div>												
DISTANCE TO SURVEY LINES <div style="text-align: center;">467 ft. EAST    237 ft. NORTH</div>		DISTANCE TO NEAREST LEASE LINE <div style="text-align: center;">200 ft.</div>										
DISTANCE TO LEASE LINES <div style="text-align: center;">467 ft. EAST    237 ft. NORTH</div>		DISTANCE TO NEAREST WELL ON LEASE <div style="text-align: center;">See FIELD(s) Below</div>										
FIELD(s) and LIMITATIONS: <div style="text-align: center; padding: 10px;">* SEE FIELD DISTRICT FOR REPORTING PURPOSES *</div>												
<table style="width: 100%; border: none;"> <tr> <td style="width: 60%;">FIELD NAME</td> <td style="width: 10%;">ACRES</td> <td style="width: 10%;">DEPTH</td> <td style="width: 10%;">WELL #</td> <td style="width: 10%;">DIST</td> </tr> <tr> <td>LEASE NAME</td> <td>NEAREST LEASE</td> <td></td> <td>NEAREST WE</td> <td></td> </tr> </table>			FIELD NAME	ACRES	DEPTH	WELL #	DIST	LEASE NAME	NEAREST LEASE		NEAREST WE	
FIELD NAME	ACRES	DEPTH	WELL #	DIST								
LEASE NAME	NEAREST LEASE		NEAREST WE									
<p>This well shall be completed and produced in compliance with applicable special field or statewide spacing and density rules. If this well is to be used for brine mining, underground storage of liquid hydrocarbons in salt formations, or underground storage of gas in salt formations, a permit for that specific purpose must be obtained from Environmental Services prior to construction, including drilling, of the well in accordance with Statewide Rules 81, 95, and 97.</p> <p>This well must comply to the new SWR 3.13 requirements concerning the isolation of any potential flow zones and zones with corrosive formation fluids. See approved permit for those formations that have been identified for the county in which you are drilling the well in.</p> <p>The designated interval for one or more of the fields approved in this permit appears to overlap with the designated interval of another field or fields in this district. In the case of conflicting designated intervals you will be required to be consistent in field designation on this lease. Further, if the designated interval overlap of wells on this lease results in an actual or potential double assignment of reservoir and the applicant cannot conclusively demonstrate that there is no double assignment, the permitted well may not be assigned an allowable until the conflict is resolved. Because of the overlapping designated intervals in this area, issuance of this permit does not guarantee that the completion of the well will be approved or that the well will receive an allowable in any given field, even if that field is listed on the approved permit application.</p>												



**RAILROAD COMMISSION OF TEXAS  
OIL & GAS DIVISION  
SWR #13 Formation Data**

**WINKLER (495) County**

Formation	Shallow Top	Deep Top	Remarks	Geological Order	Effective Date
RUSTLER	725	725	possible flow; possible usable quality water	1	12/17/2013
COLBY-QUEEN	2,900	3,200		2	12/17/2013
YATES	2,280	3,200		3	12/17/2013
QUEEN-SEVEN RIVERS	2,700	3,400		4	12/17/2013
SAN ANDRES	3,600	4,400	high flows, H2S, corrosive	5	12/17/2013
HOLT	4,500	4,800		6	12/17/2013
DELAWARE	4,300	5,000		7	12/17/2013
GLORIETA	4,900	5,600		8	12/17/2013
CLEARFORK	4,750	6,200		9	12/17/2013
WICHITA ALBANY	6,600	6,850		10	12/17/2013
BRUSHY CANYON	7,300	7,300		11	12/17/2013
CHERRY CANYON	6,000	7,800		12	12/17/2013
CANYON	8,400	8,400		13	12/17/2013
BONE SPRINGS	9,000	9,800		14	12/17/2013
MONTOYA	10,300	10,300		15	12/17/2013
WADDELL	11,000	11,000		16	12/17/2013
WOLFCAMP	7,600	12,400		17	12/17/2013
ATOKA	12,900	12,900		18	12/17/2013
STRAWN	8,100	14,800		19	12/17/2013
PENNSYLVANIAN	8,000	15,500		20	12/17/2013
MISSISSIPPIAN	10,200	17,300		21	12/17/2013
DEVONIAN	7,900	17,800		22	12/17/2013
SILURIAN	8,500	18,000		23	12/17/2013
FUSSELMAN	9,700	18,800		24	12/17/2013
ELLENBURGER	9,500	21,400		25	12/17/2013

The above list may not be all inclusive, and may also include formations that do not intersect all wellbores. Formation "TOP" information listed reflects an estimated range based on geologic variances across the county. To clarify, the "Deep Top" is not the bottom of the formation; it is the deepest depth at which the "TOP" of the formation has been or might be encountered. This is a dynamic list subject to updates and revisions. It is the operator's responsibility to make sure that at the time of spudding the well the most current list is being referenced. Refer to the RRC website at the following address for the most recent information.  
<http://www.rrc.texas.gov/oil-gas/compliance-enforcement/rule-13-geologic-formation-info>

**5D Survey Report****Forge Energy****Field Name:** *Forge-Winkler Co, TX Nad 27 TCZ***Site Name:** *UL 20 Flathead 2H***Well Name:** *UL 20 Flathead 2H***Survey:** *Definitive survey*

25 April 2017





## UL 20 Flathead 2H

Field Name:  Forge-Winkler Co, TX Nad 27 TCZ	Map Units: US ft		Company Name: Forge Energy	
	Vertical Reference Datum (VRD): Mean Sea Level			
	Projected Coordinate System: NAD27 / Texas Central			
	Comment:			
Site:  UL 20 Flathead 2H	Units: US ft	North Reference: Grid	Convergence Angle: -1.52	
	Position:	Northing: 757255.13 US ft	Latitude: 31° 42' 54.82"	
		Easting: 1081303.00 US ft	Longitude: -103° 17' 16.90"	
	Elevation above MSL:2793.00 US ft			
Comment:				
Slot:  UL 20 Flathead 2H	Position (Relative to Site Centre)			
	+N/-S: 0.00 US ft	Northing: 757255.13 US ft	Latitude: 31°42'54.82"	
	+E/-W: 0.00 US ft	Easting: 1081303.00 US ft	Longitude: -103°17'16.90"	
	Elevation above MSL: 2793.00 US ft			
	Comment:			
Well:  UL 20 Flathead 2H	Type:Main well		UWI:	
	File Number:	Comment:		
	Closure Distance:7492.08US ft		Closure Azimuth:163.72°	
	Vertical Section: Position of Origin (Relative to Slot centre)			
	+N/-S: -0.00 US ft		+E/-W: 0.00 US ft	Az: 163.72°

<b>Drill floor: Survey Name:</b> Definitive Survey			
<b>Rig Height (Well TVD Reference):</b> 25.00 US ft	<b>Elevation above MSL:</b> 2818.00 US ft	<b>Inclination:</b> 0.00°	<b>Azimuth:</b> 0.00°

<b>Survey Name:</b> Definitive Survey			
<b>Date:</b> 06/Mar/2017	<b>Survey Tool:</b> See Survey Tool Ranges below.	<b>Comment:</b>	<b>Company:</b>
<b>Magnetic Model:</b>			
<b>Model Name:</b> bggm2016	<b>Date:</b> 20/Mar/2017	<b>Field Strength:</b> 47767.3 nT	<b>Declination:</b> 6.92° <b>Dip:</b> 59.66°
<b>Tie Point:</b>			
<b>MD:</b> 0.00 US ft	<b>Inclination:</b> 0.00°	<b>Azimuth:</b> 0.00°	<b>TVD:</b> 0.00 US ft
			<b>North Offset:</b> -0.00 US ft <b>East Offset:</b> 0.00 US ft

Survey Tool Ranges:			
Name	Start MD(USFt)	End MD(USFt)	Source Survey
GYRO-NS_OW	0.00	472.00	Gyro
MWD	472.00	5067.00	Wft MWD Svy (1)
MWD	5067.00	8620.00	Wft MWD Svy (2)
MWD	8620.00	8999.00	Wft MWD Svy (3)
MWD	8999.00	9323.00	Wft MWD Svy (4)
MWD	9323.00	9586.00	Wft MWD Svy (5)

## 5D Survey Report

Survey Tool Ranges:			
Name	Start MD(USFt)	End MD(USFt)	Source Survey
MWD	9586.00	9757.00	Wft MWD Svy (6)
MWD	9757.00	11492.00	Wft MWD Svy (7)
MWD	11492.00	11967.00	1-C
MWD	11967.00	12062.00	3-C
MWD	12062.00	14667.00	4-C
MWD	14667.00	19476.00	WFT LWD Svy (12)

Casing Points: (Relative to Slot centre)(TVD relative to Well TVD Reference)								
MD (US ft)	Inc (°)	Az (°)	TVD (US ft)	N.Offset (US ft)	E.Offset (US ft)	Northing (US ft)	Easting (US ft)	Name
5135.00	0.33	201.06	5134.53	11.53	-1.97	757266.66	1081301.03	9 5/8 in
12035.00	37.21	154.41	11996.05	-165.32	48.05	757089.81	1081351.05	7 in

Wellpath created using minimum curvature.

Survey Points: (Relative to Slot centre)(TVD relative to Well TVD Reference)											
MD (US ft)	Inc (°)	Az (°)	TVD (US ft)	VS (US ft)	N.Offset (US ft)	E.Offset (US ft)	Northing (US ft)	Easting (US ft)	Clos.Dist (US ft)	Clos.Az (°)	Comment
472.00	0.44	276.20	471.99	-0.25	-0.45	-2.42	757254.68	1081300.58	2.46	259.53	Tie On Gyro
612.00	0.58	307.17	611.98	-1.02	0.04	-3.52	757255.17	1081299.48	3.52	270.65	First Wft Svy
793.00	0.69	296.36	792.97	-2.50	1.08	-5.22	757256.21	1081297.78	5.33	281.65	
974.00	0.56	288.76	973.96	-3.74	1.85	-7.04	757256.98	1081295.96	7.27	284.70	
1156.00	0.64	302.67	1155.95	-5.02	2.68	-8.73	757257.81	1081294.27	9.14	287.06	
1345.00	0.70	326.17	1344.94	-6.92	4.21	-10.26	757259.34	1081292.74	11.09	292.30	
1535.00	0.70	325.34	1534.93	-9.13	6.13	-11.57	757261.26	1081291.43	13.09	297.90	
1724.00	0.79	334.17	1723.91	-11.51	8.25	-12.80	757263.38	1081290.20	15.22	302.81	
1913.00	0.78	329.34	1912.89	-14.04	10.53	-14.02	757265.66	1081288.98	17.53	306.91	
2103.00	0.84	350.55	2102.87	-16.67	13.02	-14.91	757268.15	1081288.09	19.79	311.13	
2292.00	0.98	9.86	2291.85	-19.50	15.97	-14.86	757271.10	1081288.14	21.82	317.07	
2482.00	1.26	18.74	2481.81	-22.67	19.55	-13.91	757274.68	1081289.09	24.00	324.58	
2671.00	1.54	23.09	2670.76	-26.33	23.86	-12.24	757278.99	1081290.76	26.82	332.83	
2861.00	0.60	236.34	2860.74	-28.01	25.66	-12.07	757280.79	1081290.93	28.35	334.80	
3050.00	0.30	236.53	3049.73	-27.57	24.83	-13.31	757279.96	1081289.69	28.17	331.81	
3239.00	0.25	108.81	3238.73	-27.19	24.43	-13.33	757279.56	1081289.67	27.83	331.38	
3429.00	0.16	233.63	3428.73	-26.86	24.14	-13.15	757279.27	1081289.85	27.49	331.42	
3618.00	0.78	249.46	3617.72	-26.67	23.53	-14.57	757278.66	1081288.43	27.67	328.24	
3808.00	0.56	192.94	3807.71	-25.76	22.17	-15.99	757277.30	1081287.01	27.33	324.20	
3997.00	0.70	132.83	3996.70	-23.97	20.49	-15.35	757275.62	1081287.65	25.60	323.16	
4186.00	0.76	119.43	4185.69	-22.08	19.08	-13.41	757274.21	1081289.59	23.32	324.91	
4376.00	0.63	135.14	4375.67	-20.26	17.73	-11.58	757272.86	1081291.42	21.17	326.85	
4565.00	1.34	112.62	4564.65	-17.96	16.14	-8.80	757271.27	1081294.20	18.38	331.39	
4755.00	1.85	105.72	4754.57	-14.94	14.45	-3.80	757269.58	1081299.20	14.94	345.27	
4945.00	0.56	211.54	4944.54	-12.69	12.83	-1.33	757267.96	1081301.67	12.90	354.07	
5067.00	0.40	203.04	5066.53	-11.96	11.93	-1.81	757267.06	1081301.19	12.07	351.37	
5135.00	0.33	201.06	5134.53	-11.62	11.53	-1.97	757266.66	1081301.03	11.70	350.29	9 5/8 in
5208.00	0.25	197.66	5207.53	-11.32	11.18	-2.10	757266.31	1081300.90	11.38	349.38	
5398.00	0.38	179.86	5397.53	-10.38	10.16	-2.22	757265.29	1081300.78	10.40	347.67	
5587.00	0.49	203.69	5586.52	-9.15	8.79	-2.54	757263.92	1081300.46	9.15	343.86	
5777.00	0.60	229.04	5776.51	-8.12	7.40	-3.62	757262.53	1081299.38	8.24	333.91	
5966.00	1.05	224.34	5965.49	-6.85	5.51	-5.58	757260.64	1081297.42	7.84	314.64	
6156.00	0.70	218.56	6155.47	-5.33	3.36	-7.52	757258.49	1081295.48	8.24	294.06	
6345.00	0.94	231.26	6344.45	-4.07	1.48	-9.45	757256.61	1081293.55	9.56	278.93	
6535.00	1.00	234.10	6534.43	-2.92	-0.46	-12.01	757254.67	1081290.99	12.02	267.79	
6725.00	0.99	243.40	6724.40	-2.07	-2.17	-14.82	757252.96	1081288.18	14.98	261.67	
6914.00	1.16	244.60	6913.36	-1.47	-3.72	-18.01	757251.41	1081284.99	18.39	258.32	
7104.00	1.26	224.60	7103.32	-0.15	-6.03	-21.21	757249.10	1081281.79	22.05	254.12	
7294.00	1.24	227.18	7293.28	1.78	-8.92	-24.19	757246.21	1081278.81	25.78	249.76	
7483.00	1.00	206.85	7482.24	3.90	-11.78	-26.43	757243.35	1081276.57	28.94	245.98	
7673.00	1.23	223.83	7672.21	6.13	-14.73	-28.59	757240.40	1081274.41	32.16	242.74	

## 5D Survey Report

Survey Points: (Relative to Slot centre)(TVD relative to Well TVD Reference)											
MD (US ft)	Inc (°)	Az (°)	TVD (US ft)	VS (US ft)	N.Offset (US ft)	E.Offset (US ft)	Northing (US ft)	Easting (US ft)	Clos.Dist (US ft)	Clos.Az (°)	Comment
7862.00	1.35	219.06	7861.16	8.40	-17.92	-31.40	757237.21	1081271.60	36.15	240.28	
8052.00	1.51	218.83	8051.10	11.11	-21.61	-34.38	757233.52	1081268.62	40.61	237.85	
8241.00	0.56	219.15	8240.07	13.06	-24.27	-36.52	757230.86	1081266.48	43.85	236.40	
8431.00	1.24	225.74	8430.04	14.55	-26.42	-38.58	757228.71	1081264.42	46.76	235.60	
8620.00	1.79	241.17	8618.98	16.15	-29.27	-42.63	757225.86	1081260.37	51.72	235.52	
8810.00	1.12	255.21	8808.91	16.74	-31.18	-47.03	757223.95	1081255.97	56.42	236.46	
8999.00	2.87	235.47	8997.79	18.18	-34.33	-52.71	757220.80	1081250.29	62.91	236.92	
9094.00	1.89	255.04	9092.71	18.89	-36.08	-56.19	757219.05	1081246.81	66.77	237.29	
9189.00	0.91	302.39	9187.68	18.28	-36.09	-58.34	757219.04	1081244.66	68.59	238.26	
9323.00	1.06	342.89	9321.67	16.25	-34.33	-59.60	757220.80	1081243.40	68.78	240.06	
9473.00	1.25	0.27	9471.64	13.29	-31.37	-60.00	757223.76	1081243.00	67.70	242.40	
9586.00	1.27	63.78	9584.61	11.89	-29.58	-58.87	757225.55	1081244.13	65.88	243.32	
9757.00	1.45	70.57	9755.57	11.45	-28.03	-55.13	757227.10	1081247.87	61.84	243.05	
9851.00	1.84	78.80	9849.53	11.52	-27.34	-52.53	757227.79	1081250.47	59.22	242.51	
10041.00	2.66	48.96	10039.39	9.94	-23.85	-46.21	757231.28	1081256.79	52.00	242.70	
10231.00	2.95	13.01	10229.17	3.83	-16.19	-41.78	757238.94	1081261.22	44.81	248.82	
10420.00	1.78	26.73	10418.01	-2.56	-8.83	-39.37	757246.30	1081263.63	40.35	257.36	
10610.00	1.48	359.96	10607.93	-7.07	-3.74	-38.04	757251.39	1081264.96	38.23	264.38	
10800.00	0.94	159.15	10797.92	-7.88	-2.74	-37.49	757252.39	1081265.51	37.59	265.82	
10990.00	1.59	154.87	10987.87	-3.72	-6.59	-35.82	757248.54	1081267.18	36.42	259.58	
11179.00	2.68	179.30	11176.74	3.13	-13.38	-34.65	757241.75	1081268.35	37.14	248.89	
11369.00	1.82	175.17	11366.59	10.37	-20.83	-34.34	757234.30	1081268.66	40.16	238.76	
11492.00	1.75	171.67	11489.53	14.14	-24.63	-33.90	757230.50	1081269.10	41.91	234.00	
11538.00	1.84	169.32	11535.51	15.57	-26.05	-33.66	757229.08	1081269.34	42.57	232.26	
11570.00	2.94	163.23	11567.48	16.90	-27.34	-33.33	757227.79	1081269.67	43.11	230.64	
11601.00	5.34	164.99	11598.40	19.14	-29.50	-32.73	757225.63	1081270.27	44.06	227.97	
11633.00	7.76	159.63	11630.19	22.78	-32.96	-31.59	757222.17	1081271.41	45.66	223.78	
11665.00	9.43	156.40	11661.83	27.54	-37.39	-29.79	757217.74	1081273.21	47.81	218.55	
11696.00	11.78	151.30	11692.30	33.15	-42.49	-27.25	757212.64	1081275.75	50.48	212.67	
11728.00	14.76	148.30	11723.44	40.27	-48.83	-23.54	757206.30	1081279.46	54.21	205.74	
11759.00	17.71	147.18	11753.20	48.60	-56.15	-18.91	757198.98	1081284.09	59.25	198.61	
11791.00	20.20	149.19	11783.46	58.61	-64.99	-13.44	757190.14	1081289.56	66.36	191.69	
11823.00	22.65	149.70	11813.25	69.94	-75.06	-7.50	757180.07	1081295.50	75.43	185.71	
11854.00	24.70	149.18	11841.64	82.00	-85.77	-1.17	757169.36	1081301.83	85.78	180.78	
11886.00	26.53	148.44	11870.49	95.37	-97.60	6.00	757157.53	1081309.00	97.79	176.49	
11917.00	29.16	146.59	11897.90	109.27	-109.81	13.78	757145.32	1081316.78	110.67	172.85	
11949.00	31.81	145.24	11925.47	124.72	-123.25	22.88	757131.88	1081325.88	125.36	169.48	
11967.00	33.66	145.31	11940.62	133.96	-131.25	28.43	757123.88	1081331.43	134.29	167.78	
12035.00	37.21	154.41	11996.05	172.16	-165.32	48.05	757089.81	1081351.05	172.16	163.79	7 in
12037.00	37.32	154.65	11997.64	173.36	-166.41	48.57	757088.72	1081351.57	173.36	163.73	
12062.00	36.58	155.62	12017.62	188.22	-180.05	54.89	757075.08	1081357.89	188.23	163.04	
12106.00	36.10	157.36	12053.07	214.08	-203.95	65.30	757051.18	1081368.30	214.15	162.25	
12138.00	38.31	161.94	12078.56	233.37	-222.09	72.00	757033.04	1081375.00	233.47	162.04	
12170.00	41.18	164.78	12103.16	253.82	-241.69	77.84	757013.44	1081380.84	253.92	162.15	
12201.00	44.42	166.34	12125.90	274.87	-262.09	83.09	756993.04	1081386.09	274.94	162.41	
12233.00	47.79	167.32	12148.09	297.89	-284.54	88.33	756970.59	1081391.33	297.93	162.75	
12264.00	51.21	167.46	12168.22	321.41	-307.54	93.48	756947.59	1081396.48	321.43	163.09	
12296.00	54.60	165.27	12187.52	346.90	-332.33	99.50	756922.80	1081402.50	346.91	163.33	
12328.00	58.03	164.77	12205.26	373.52	-358.05	106.39	756897.08	1081409.39	373.52	163.45	
12359.00	60.78	165.54	12221.04	400.19	-383.84	113.22	756871.29	1081416.22	400.19	163.57	
12391.00	63.39	165.77	12236.02	428.45	-411.24	120.23	756843.89	1081423.23	428.45	163.70	
12422.00	65.67	166.50	12249.35	456.41	-438.41	126.93	756816.72	1081429.93	456.41	163.85	
12454.00	68.14	166.58	12261.90	485.81	-467.03	133.78	756788.10	1081436.78	485.81	164.02	
12486.00	70.11	166.86	12273.30	515.67	-496.13	140.65	756759.00	1081443.65	515.68	164.17	
12517.00	71.73	166.50	12283.44	544.92	-524.64	147.40	756730.49	1081450.40	544.95	164.31	
12549.00	73.43	165.79	12293.02	575.43	-554.28	154.71	756700.85	1081457.71	575.47	164.40	
12580.00	74.65	165.26	12301.54	605.22	-583.14	162.16	756671.99	1081465.16	605.27	164.46	
12612.00	75.52	164.78	12309.78	636.13	-613.01	170.15	756642.12	1081473.15	636.19	164.49	
12644.00	76.68	164.21	12317.46	667.19	-642.94	178.46	756612.19	1081481.46	667.25	164.49	

## 5D Survey Report

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12675.00	78.00	163.61	12324.26	697.43	-672.00	186.84	756583.13	1081489.84	697.49	164.46	
12707.00	79.88	163.06	12330.40	728.84	-702.09	195.85	756553.04	1081498.85	728.89	164.41	
12738.00	81.95	162.10	12335.29	759.44	-731.29	205.01	756523.84	1081508.01	759.48	164.34	
12770.00	83.33	162.38	12339.39	791.17	-761.51	214.69	756493.62	1081517.69	791.20	164.26	
12802.00	85.12	162.63	12342.61	822.99	-791.88	224.26	756463.25	1081527.26	823.02	164.19	
12833.00	86.42	163.04	12344.90	853.91	-821.42	233.39	756433.71	1081536.39	853.93	164.14	
12865.00	88.09	163.07	12346.43	885.87	-851.99	242.70	756403.14	1081545.70	885.88	164.10	
12896.00	90.49	163.08	12346.81	916.86	-881.64	251.73	756373.49	1081554.73	916.88	164.06	
12927.00	90.80	163.02	12346.46	947.85	-911.29	260.76	756343.84	1081563.76	947.87	164.03	
12959.00	89.88	162.70	12346.27	979.85	-941.87	270.19	756313.26	1081573.19	979.86	163.99	
13053.00	90.25	162.93	12346.17	1073.84	-1031.68	297.97	756223.45	1081600.97	1073.84	163.89	
13148.00	89.63	162.29	12346.27	1168.82	-1122.33	326.36	756132.80	1081629.36	1168.82	163.79	
13243.00	89.88	162.90	12346.67	1263.80	-1212.98	354.77	756042.15	1081657.77	1263.80	163.70	
13338.00	90.25	162.13	12346.56	1358.78	-1303.59	383.32	755951.54	1081686.32	1358.78	163.61	
13433.00	89.38	161.59	12346.87	1453.73	-1393.87	412.89	755861.26	1081715.89	1453.74	163.50	
13529.00	89.20	160.50	12348.06	1549.61	-1484.65	444.07	755770.48	1081747.07	1549.65	163.35	
13624.00	89.07	162.30	12349.50	1644.52	-1574.68	474.37	755680.45	1081777.37	1644.58	163.24	
13718.00	89.20	162.33	12350.91	1738.48	-1664.23	502.92	755590.90	1081805.92	1738.56	163.19	
13813.00	89.51	163.10	12351.98	1833.46	-1754.93	531.15	755500.20	1081834.15	1833.55	163.16	
13909.00	92.16	165.26	12350.58	1929.43	-1847.27	557.31	755407.86	1081860.31	1929.51	163.21	
14003.00	91.42	165.10	12347.65	2023.35	-1938.10	581.35	755317.03	1081884.35	2023.41	163.30	
14098.00	91.36	164.92	12345.34	2118.30	-2029.84	605.91	755225.29	1081908.91	2118.34	163.38	
14193.00	90.99	163.99	12343.40	2213.27	-2121.34	631.36	755133.79	1081934.36	2213.30	163.43	
14287.00	93.39	163.59	12339.80	2307.20	-2211.53	657.58	755043.60	1081960.58	2307.23	163.44	
14383.00	91.85	162.94	12335.42	2403.09	-2303.37	685.20	754951.76	1081988.20	2403.12	163.43	
14478.00	90.19	163.91	12333.72	2498.07	-2394.40	712.29	754860.73	1082015.29	2498.10	163.43	
14572.00	90.31	163.18	12333.31	2592.07	-2484.55	738.92	754770.58	1082041.92	2592.10	163.44	
14667.00	90.25	162.43	12332.85	2687.05	-2575.30	767.00	754679.83	1082070.00	2687.09	163.41	
14762.00	87.53	162.57	12334.69	2782.01	-2665.88	795.56	754589.25	1082098.56	2782.05	163.38	
14857.00	89.20	163.70	12337.40	2876.96	-2756.75	823.11	754498.38	1082126.11	2877.01	163.38	
14951.00	90.80	165.16	12337.40	2970.94	-2847.30	848.34	754407.83	1082151.34	2970.99	163.41	
15046.00	92.96	166.94	12334.28	3065.81	-2939.44	871.23	754315.69	1082174.23	3065.83	163.49	
15140.00	91.11	166.91	12330.95	3159.60	-3030.94	892.48	754224.19	1082195.48	3159.60	163.59	
15235.00	91.36	166.03	12328.90	3254.46	-3123.28	914.70	754131.85	1082217.70	3254.46	163.68	
15330.00	91.91	166.68	12326.19	3349.32	-3215.56	937.10	754039.57	1082240.10	3349.32	163.75	
15424.00	89.38	165.52	12325.13	3443.23	-3306.79	959.68	753948.34	1082262.68	3443.23	163.82	
15519.00	90.97	165.17	12324.84	3538.18	-3398.70	983.71	753856.43	1082286.71	3538.20	163.86	
15614.00	91.30	164.56	12322.96	3633.15	-3490.38	1008.51	753764.75	1082311.51	3633.16	163.88	
15709.00	89.01	164.27	12322.70	3728.13	-3581.88	1034.03	753673.25	1082337.03	3728.15	163.90	
15804.00	90.43	163.43	12323.17	3823.13	-3673.13	1060.46	753582.00	1082363.46	3823.15	163.90	
15899.00	88.09	160.38	12324.39	3918.05	-3763.41	1089.95	753491.72	1082392.95	3918.06	163.85	
15994.00	89.94	160.98	12326.03	4012.90	-3853.04	1121.38	753402.09	1082424.38	4012.90	163.77	
16089.00	93.58	165.37	12323.11	4107.81	-3943.89	1148.85	753311.24	1082451.85	4107.82	163.76	
16183.00	90.68	164.46	12319.61	4201.72	-4034.58	1173.30	753220.55	1082476.30	4201.72	163.79	
16278.00	93.08	167.02	12316.50	4296.59	-4126.59	1196.68	753128.54	1082499.68	4296.60	163.83	
16373.00	91.60	165.22	12312.62	4391.42	-4218.73	1219.45	753036.40	1082522.45	4391.44	163.88	
16468.00	90.80	162.63	12310.63	4486.39	-4309.99	1245.75	752945.14	1082548.75	4486.41	163.88	
16563.00	90.26	162.00	12309.75	4581.36	-4400.49	1274.61	752854.64	1082577.61	4581.37	163.85	
16657.00	90.86	162.81	12308.83	4675.33	-4490.09	1303.02	752765.04	1082606.02	4675.34	163.82	
16752.00	90.80	163.24	12307.45	4770.31	-4580.94	1330.75	752674.19	1082633.75	4770.32	163.80	
16847.00	91.29	162.96	12305.72	4865.29	-4671.82	1358.37	752583.31	1082661.37	4865.29	163.79	
16942.00	90.97	161.64	12303.85	4960.24	-4762.31	1387.24	752492.82	1082690.24	4960.24	163.76	
17036.00	91.48	161.60	12301.84	5054.16	-4851.49	1416.88	752403.64	1082719.88	5054.16	163.72	
17131.00	91.66	162.20	12299.24	5149.07	-4941.75	1446.38	752313.38	1082749.38	5149.07	163.69	
17226.00	90.99	162.10	12297.04	5244.01	-5032.16	1475.49	752222.97	1082778.49	5244.01	163.66	
17321.00	92.16	162.92	12294.43	5338.95	-5122.73	1504.03	752132.40	1082807.03	5338.96	163.64	
17415.00	88.95	164.20	12293.52	5432.93	-5212.87	1530.63	752042.26	1082833.63	5432.94	163.64	
17510.00	88.68	164.11	12295.48	5527.91	-5304.24	1556.56	751950.89	1082859.56	5527.91	163.65	
17605.00	88.89	163.62	12297.50	5622.89	-5395.48	1582.96	751859.65	1082885.96	5622.89	163.65	



## 5D Survey Report

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17699.00	90.99	164.93	12297.60	5716.87	-5485.95	1608.43	751769.18	1082911.43	5716.88	163.66	
17794.00	90.12	164.16	12296.67	5811.86	-5577.51	1633.74	751677.62	1082936.74	5811.86	163.67	
17889.00	89.38	163.23	12297.09	5906.86	-5668.69	1660.42	751586.44	1082963.42	5906.86	163.67	
17984.00	90.12	163.65	12297.50	6001.85	-5759.74	1687.49	751495.39	1082990.49	6001.86	163.67	
18079.00	89.32	162.70	12297.97	6096.85	-5850.67	1714.99	751404.46	1083017.99	6096.85	163.66	
18174.00	91.59	162.88	12297.21	6191.82	-5941.41	1743.09	751313.72	1083046.09	6191.83	163.65	
18269.00	91.48	163.90	12294.67	6286.79	-6032.41	1770.24	751222.72	1083073.24	6286.79	163.65	
18364.00	94.50	165.05	12289.71	6381.64	-6123.81	1795.63	751131.32	1083098.63	6381.64	163.66	
18459.00	89.14	163.58	12286.70	6476.55	-6215.19	1821.29	751039.94	1083124.29	6476.55	163.67	
18554.00	92.12	163.58	12285.65	6571.53	-6306.30	1848.14	750948.83	1083151.14	6571.53	163.67	
18648.00	91.60	162.30	12282.60	6665.47	-6396.11	1875.70	750859.02	1083178.70	6665.47	163.66	
18743.00	89.75	161.33	12281.48	6760.41	-6486.36	1905.35	750768.77	1083208.35	6760.41	163.63	
18838.00	91.91	161.98	12280.11	6855.33	-6576.51	1935.24	750678.62	1083238.24	6855.34	163.60	
18932.00	95.25	163.86	12274.24	6949.12	-6666.18	1962.80	750588.95	1083265.80	6949.13	163.59	
19027.00	93.33	163.34	12267.13	7043.85	-6757.05	1989.54	750498.08	1083292.54	7043.86	163.59	
19122.00	91.67	164.46	12262.99	7138.75	-6848.23	2015.86	750406.90	1083318.86	7138.77	163.60	
19217.00	92.28	167.26	12259.71	7233.62	-6940.29	2039.05	750314.84	1083342.05	7233.63	163.63	
19312.00	93.27	167.66	12255.11	7328.30	-7032.91	2059.65	750222.22	1083362.65	7328.31	163.68	
19407.00	91.91	164.94	12250.82	7423.10	-7125.11	2082.13	750130.02	1083385.13	7423.10	163.71	
19453.00	90.55	164.00	12249.83	7469.08	-7169.41	2094.44	750085.72	1083397.44	7469.08	163.72	Last Wft Svy
19476.00	90.55	164.00	12249.61	7492.08	-7191.52	2100.78	750063.61	1083403.78	7492.08	163.72	PTB





**Weatherford®**

Evaluation, Drilling & Intervention

10000 West County Rd. 116

P.O. Box 61028

Midland, TX USA 79711

Tel. (432) 561-8892 Fax (432) 561-8895

State Of Texas  
County Of Winkler

I, Obinna Nwachukwu certify that I am employed by Precision Energy Services, Inc., a Weatherford Company, and on the days of 03/18/17 through 4/22/2017 I did conduct, or supervise the taking of a Measurement While Drilling survey from a depth of 612 MD ft. to a depth of 19453MD ft., that the data is true, correct, complete, and within the limitations of the tool as set forth by Weatherford; that I am authorized and qualified to make this report, that this survey was conducted at the request of: Forge Energy for the UL 20 Flathead 2H well, API Number: 42-495-33782 in Winkler County, Texas; and find that it conforms to the principles and procedures as set forth by Weatherford.

Sincerely,

Jonathan Leger  
MWD Ops. Coordinator