

District I
1625 N. French Dr., Hobbs, NM 88240
District II
811 S. First St., Artesia, NM 88210
District III
1000 Rio Brazos Rd., Aztec, NM 87410
District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico
Energy, Minerals & Natural Resources
Oil Conservation Division
1220 South St. Francis Dr.
Santa Fe, NM 87505

Form C-104
Revised August 1, 2011

Submit one copy to appropriate District Office

AMENDED REPORT

I. REQUEST FOR ALLOWABLE AND AUTHORIZATION TO TRANSPORT

¹ Operator name and Address OXY USA INC. PO BOX 50250 MIDLAND, TX 79710		² OGRID Number 16696
		³ Reason for Filing Code/ Effective Date NW - 05/18/2023
⁴ API Number 30 - 015-47627	⁵ Pool Name WC 22S31E13; WOLFCAMP	⁶ Pool Code 98351
⁷ Property Code 329719	⁸ Property Name TOP SPOT 12 13 FEDERAL COM	⁹ Well Number 311H

II. 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
N	13	22S	31E		473	South	2052	West	Eddy

¹¹ Bottom Hole Location

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
D	12	22S	31E		44	North	1088	West	Eddy
¹² Lse Code F	¹³ Producing Method Code F	¹⁴ Gas Connection Date 5/26/2023	¹⁵ C-129 Permit Number	¹⁶ C-129 Effective Date	¹⁷ C-129 Expiration Date				

III. Oil and Gas Transporters

¹⁸ Transporter OGRID	¹⁹ Transporter Name and Address	²⁰ O/G/W
237722	Centurion Pipeline L.P.	O
248749	DCP Midstream, L.P.	G

IV. Well Completion Data

²¹ Spud Date	²² Ready Date	²³ TD	²⁴ PBDT	²⁵ Perforations	²⁶ DHC, MC
10/27/2022	05/18/2023	22518' MD, 11887' TVD	22496' MD, 11887' TVD	12117-22267	
²⁷ Hole Size	²⁸ Casing & Tubing Size	²⁹ Depth Set	³⁰ Sacks Cement		
17 1/2"	13 3/8" 54.5# J55 BTC	885'	1085sx - TOC 0'		
12 1/4"	9 5/8" 40# HCL80	4566'	1400sx - TOC 0'		
8 3/4"	7 5/8" 26.4# HCL80	11167'	331sx- TOC 9295'		
6 3/4"	5 1/2" 20# P110	22498'	875 2100 sx - TOC 10533'		

V. Well Test Data

³¹ Date New Oil	³² Gas Delivery Date	³³ Test Date	³⁴ Test Length	³⁵ Tbg. Pressure	³⁶ Csg. Pressure
05/26/2023	05/26/2023	06/06/2023	24 Hours	0	2535
³⁷ Choke Size	³⁸ Oil	³⁹ Water	⁴⁰ Gas		
0	7137	6226	10241		
			⁴¹ Test Method		
			Flowing		

⁴² I hereby certify that the rules of the Oil Conservation Division have been complied with and that the information given above is true and complete to the best of my knowledge and belief. Signature: <i>Sarah McKinney</i> Printed name: Sarah McKinney Title: Regulatory Analyst Sr. E-mail Address: sarah_mckinney@oxy.com Date: 06/22/2023 Phone: 713-215-7295	OIL CONSERVATION DIVISION	
	Approved by: <i>PATRICIA MARTINEZ</i>	
	Title: <i>PETROLEUM SPECIALIST</i>	
	Approval Date: <i>8/25/2023</i>	

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

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

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

AMENDED REPORT
As-Drilled Plat

WELL LOCATION AND ACERAGE DEDICATION PLAT

¹ API Number 30-015-47627	² Pool Code 98351	³ Pool Name WC 22S31E13, WOLFCAMP
⁴ Property Code 329719	⁵ Property Name TOP SPOT 12 13 FEDERAL COM	⁶ Well Number 311H
⁷ OGRID No. 16696	⁸ Operator Name OXY USA INC.	⁹ Elevation 3567'

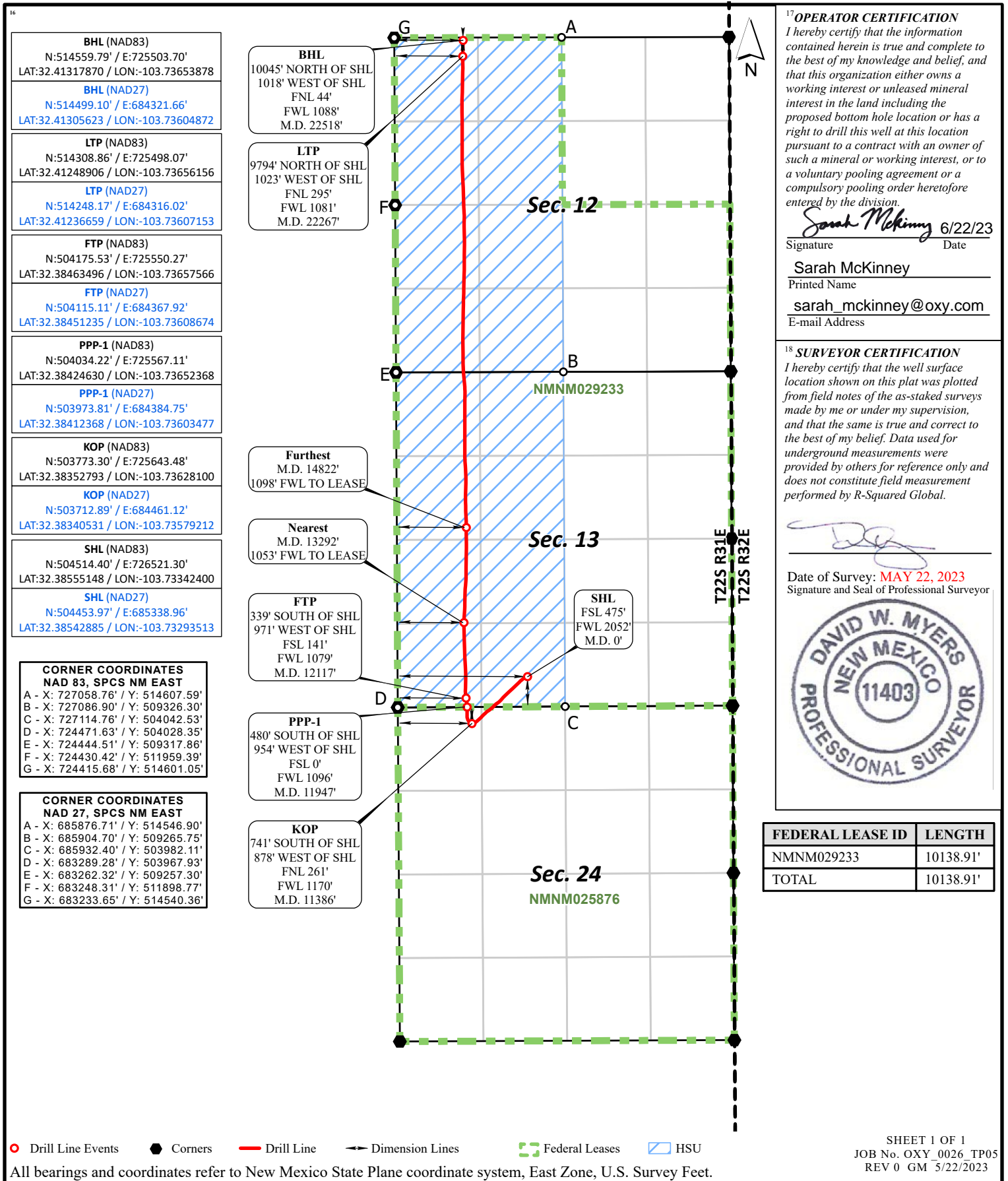
¹⁰ Surface Location

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
N	13	22S	31E		475	473 South	2052	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
D	12	22S	31E		44	North	1088	West	EDDY
¹² Dedicated Acres 640.00		¹³ Joint or Infill		¹⁴ Consolidation Code		¹⁵ Order No.			

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



Distances/areas relative to NAD 83 Combined Scale Factor: 0.999777779 Convergence Angle: 0.3213°

H&P 419

Occidental Petroleum Corporation

Eddy County, NM (NAD83) Top Spot 12-13

API# 30-015-47627

Top Spot 12-13 Federal Com 311H

OH

Design: Final Surveys

Sperry Drilling Services

Combo Report

15 May, 2023

Well Coordinates: 32° 23' 7.985 N
103° 44' 0.326 W

North American Datum 1983
New Mexico Eastern Zone
504,514.40 N
726,521.30 E

Ground Level: 3,567.20 usft

Local Coordinate Origin:

Centered on Well Top Spot 12-13 Federal Com 311H

Viewing Datum:

GL 3567.2' + RKB 26' @ 3593.20usft (H&P 419)

TVDs to System:

N

North Reference:

Grid

Unit System:

API-US Survey Feet

Compass Version: 5000.15 Build: 91E

Report Version: Midcon Combo v1.15

HALLIBURTON

HALLIBURTON

Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
0.00	0.00	0.00	0.00	0.00 N	0.00 E	504,514.40	726,521.30	0.00	0.00	0.00	
2.00	0.00	0.00	2.00	0.00 N	0.00 E	504,514.40	726,521.30	0.00	0.00	0.00	
4.00	0.00	0.00	4.00	0.00 N	0.00 E	504,514.40	726,521.30	0.00	0.00	0.00	
6.00	0.00	0.00	6.00	0.00 N	0.00 E	504,514.40	726,521.30	0.00	0.00	0.00	
8.00	0.00	0.00	8.00	0.00 N	0.00 E	504,514.40	726,521.30	0.00	0.00	0.00	
10.00	0.00	0.00	10.00	0.00 N	0.00 E	504,514.40	726,521.30	0.00	0.00	0.00	
12.00	0.00	0.00	12.00	0.00 N	0.00 E	504,514.40	726,521.30	0.00	0.00	0.00	
14.00	0.00	0.00	14.00	0.00 N	0.00 E	504,514.40	726,521.30	0.00	0.00	0.00	
16.00	0.00	0.00	16.00	0.00 N	0.00 E	504,514.40	726,521.30	0.00	0.00	0.00	
18.00	0.00	0.00	18.00	0.00 N	0.00 E	504,514.40	726,521.30	0.00	0.00	0.00	18ft KB Offset
20.00	0.02	358.94	20.00	0.00 N	0.00 W	504,514.40	726,521.30	0.84	0.00	358.94	
22.00	0.03	358.94	22.00	0.00 N	0.00 W	504,514.40	726,521.30	0.84	0.00	0.00	
24.00	0.05	358.94	24.00	0.00 N	0.00 W	504,514.40	726,521.30	0.84	0.00	0.00	
26.00	0.07	358.94	26.00	0.00 N	0.00 W	504,514.40	726,521.30	0.84	0.00	0.00	
28.00	0.08	358.94	28.00	0.01 N	0.00 W	504,514.41	726,521.30	0.84	0.01	0.00	
30.00	0.10	358.94	30.00	0.01 N	0.00 W	504,514.41	726,521.30	0.84	0.01	0.00	
32.00	0.12	358.94	32.00	0.01 N	0.00 W	504,514.41	726,521.30	0.84	0.01	0.00	
34.00	0.13	358.94	34.00	0.02 N	0.00 W	504,514.42	726,521.30	0.84	0.02	0.00	
36.00	0.15	358.94	36.00	0.02 N	0.00 W	504,514.42	726,521.30	0.84	0.02	0.00	
38.00	0.17	358.94	38.00	0.03 N	0.00 W	504,514.43	726,521.30	0.84	0.03	0.00	
40.00	0.18	358.94	40.00	0.04 N	0.00 W	504,514.44	726,521.30	0.84	0.04	0.00	
42.00	0.20	358.94	42.00	0.04 N	0.00 W	504,514.44	726,521.30	0.84	0.04	0.00	
44.00	0.22	358.94	44.00	0.05 N	0.00 W	504,514.45	726,521.30	0.84	0.05	0.00	
46.00	0.23	358.94	46.00	0.06 N	0.00 W	504,514.46	726,521.30	0.84	0.06	0.00	
48.00	0.25	358.94	48.00	0.07 N	0.00 W	504,514.47	726,521.30	0.84	0.07	0.00	
50.00	0.27	358.94	50.00	0.07 N	0.00 W	504,514.47	726,521.30	0.84	0.07	0.00	
52.00	0.28	358.94	52.00	0.08 N	0.00 W	504,514.48	726,521.30	0.84	0.08	0.00	
54.00	0.30	358.94	54.00	0.09 N	0.00 W	504,514.49	726,521.30	0.84	0.09	0.00	
56.00	0.32	358.94	56.00	0.11 N	0.00 W	504,514.51	726,521.30	0.84	0.11	0.00	
58.00	0.33	358.94	58.00	0.12 N	0.00 W	504,514.52	726,521.30	0.84	0.12	0.00	
60.00	0.35	358.94	60.00	0.13 N	0.00 W	504,514.53	726,521.30	0.84	0.13	0.00	
62.00	0.37	358.94	62.00	0.14 N	0.00 W	504,514.54	726,521.30	0.84	0.14	0.00	
64.00	0.38	358.94	64.00	0.15 N	0.00 W	504,514.55	726,521.30	0.84	0.15	0.00	
66.00	0.40	358.94	66.00	0.17 N	0.00 W	504,514.57	726,521.30	0.84	0.17	0.00	
68.00	0.42	358.94	68.00	0.18 N	0.00 W	504,514.58	726,521.30	0.84	0.18	0.00	
68.19	0.42	358.94	68.19	0.18 N	0.00 W	504,514.58	726,521.30	0.84	0.18	0.00	First Gyro @ 68.19'MD



Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
70.00	0.41	358.70	70.00	0.20 N	0.00 W	504,514.60	726,521.30	0.63	0.20	-171.24	
72.00	0.40	358.42	72.00	0.21 N	0.00 W	504,514.61	726,521.30	0.63	0.21	-171.00	
74.00	0.38	358.12	74.00	0.22 N	0.00 W	504,514.62	726,521.30	0.63	0.22	-170.72	
76.00	0.37	357.79	76.00	0.24 N	0.00 W	504,514.64	726,521.30	0.63	0.24	-170.42	
78.00	0.36	357.45	78.00	0.25 N	0.01 W	504,514.65	726,521.29	0.63	0.25	-170.10	
80.00	0.35	357.08	80.00	0.26 N	0.01 W	504,514.66	726,521.29	0.63	0.26	-169.75	
82.00	0.33	356.69	82.00	0.27 N	0.01 W	504,514.67	726,521.29	0.63	0.27	-169.39	
84.00	0.32	356.27	84.00	0.29 N	0.01 W	504,514.69	726,521.29	0.63	0.29	-168.99	
86.00	0.31	355.81	86.00	0.30 N	0.01 W	504,514.70	726,521.29	0.63	0.30	-168.57	
88.00	0.30	355.31	88.00	0.31 N	0.01 W	504,514.71	726,521.29	0.63	0.31	-168.11	
90.00	0.29	354.78	90.00	0.32 N	0.01 W	504,514.72	726,521.29	0.63	0.32	-167.62	
92.00	0.27	354.19	92.00	0.33 N	0.01 W	504,514.73	726,521.29	0.63	0.33	-167.08	
94.00	0.26	353.55	94.00	0.34 N	0.01 W	504,514.74	726,521.29	0.63	0.34	-166.50	
96.00	0.25	352.85	96.00	0.35 N	0.01 W	504,514.75	726,521.29	0.63	0.35	-165.86	
98.00	0.24	352.08	98.00	0.35 N	0.01 W	504,514.75	726,521.29	0.63	0.35	-165.15	
100.00	0.23	351.22	100.00	0.36 N	0.02 W	504,514.76	726,521.28	0.63	0.36	-164.38	
102.00	0.21	350.27	102.00	0.37 N	0.02 W	504,514.77	726,521.28	0.63	0.37	-163.52	
104.00	0.20	349.21	104.00	0.38 N	0.02 W	504,514.78	726,521.28	0.63	0.38	-162.57	
106.00	0.19	348.01	106.00	0.38 N	0.02 W	504,514.78	726,521.28	0.63	0.38	-161.51	
108.00	0.18	346.65	108.00	0.39 N	0.02 W	504,514.79	726,521.28	0.63	0.39	-160.31	
110.00	0.17	345.11	110.00	0.40 N	0.02 W	504,514.80	726,521.28	0.63	0.40	-158.96	
112.00	0.15	343.33	112.00	0.40 N	0.02 W	504,514.80	726,521.28	0.63	0.40	-157.41	
114.00	0.14	341.27	114.00	0.41 N	0.02 W	504,514.81	726,521.28	0.63	0.41	-155.63	
116.00	0.13	338.87	116.00	0.41 N	0.03 W	504,514.81	726,521.27	0.63	0.41	-153.57	
118.00	0.12	336.03	118.00	0.41 N	0.03 W	504,514.81	726,521.27	0.63	0.42	-151.17	
120.00	0.11	332.65	120.00	0.42 N	0.03 W	504,514.82	726,521.27	0.63	0.42	-148.33	
122.00	0.10	328.58	122.00	0.42 N	0.03 W	504,514.82	726,521.27	0.63	0.42	-144.95	
124.00	0.10	327.95	124.00	0.42 N	0.03 W	504,514.82	726,521.27	0.09	0.43	-140.89	
126.00	0.10	327.95	126.00	0.43 N	0.04 W	504,514.83	726,521.26	0.00	0.43	0.00	
128.00	0.10	327.95	128.00	0.43 N	0.04 W	504,514.83	726,521.26	0.00	0.43	0.00	
130.00	0.10	330.72	130.00	0.43 N	0.04 W	504,514.83	726,521.26	0.29	0.44	126.91	
132.00	0.10	331.47	132.00	0.44 N	0.04 W	504,514.84	726,521.26	0.08	0.44	124.14	
134.00	0.09	332.24	134.00	0.44 N	0.04 W	504,514.84	726,521.26	0.08	0.44	123.39	
136.00	0.09	333.01	136.00	0.44 N	0.04 W	504,514.84	726,521.26	0.08	0.44	122.63	
138.00	0.09	333.80	138.00	0.45 N	0.05 W	504,514.85	726,521.25	0.08	0.45	121.85	
140.00	0.09	334.61	140.00	0.45 N	0.05 W	504,514.85	726,521.25	0.08	0.45	121.06	
142.00	0.09	335.42	142.00	0.45 N	0.05 W	504,514.85	726,521.25	0.08	0.45	120.26	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
144.00	0.09	336.25	144.00	0.45 N	0.05 W	504,514.85	726,521.25	0.08	0.46	119.44	
146.00	0.09	337.10	146.00	0.46 N	0.05 W	504,514.86	726,521.25	0.08	0.46	118.61	
148.00	0.09	337.95	148.00	0.46 N	0.05 W	504,514.86	726,521.25	0.08	0.46	117.77	
150.00	0.09	338.82	150.00	0.46 N	0.05 W	504,514.86	726,521.25	0.08	0.47	116.91	
152.00	0.09	339.71	152.00	0.47 N	0.05 W	504,514.87	726,521.25	0.08	0.47	116.04	
154.00	0.09	340.60	154.00	0.47 N	0.05 W	504,514.87	726,521.25	0.08	0.47	115.16	
156.00	0.09	341.51	156.00	0.47 N	0.06 W	504,514.87	726,521.24	0.08	0.47	114.26	
158.00	0.09	342.43	158.00	0.47 N	0.06 W	504,514.87	726,521.24	0.08	0.48	113.35	
160.00	0.09	343.37	160.00	0.48 N	0.06 W	504,514.88	726,521.24	0.08	0.48	112.43	
162.00	0.09	344.31	162.00	0.48 N	0.06 W	504,514.88	726,521.24	0.08	0.48	111.50	
164.00	0.08	345.27	164.00	0.48 N	0.06 W	504,514.88	726,521.24	0.08	0.49	110.55	
166.00	0.08	346.24	166.00	0.49 N	0.06 W	504,514.89	726,521.24	0.08	0.49	109.59	
168.00	0.08	347.22	168.00	0.49 N	0.06 W	504,514.89	726,521.24	0.08	0.49	108.62	
170.00	0.08	348.21	170.00	0.49 N	0.06 W	504,514.89	726,521.24	0.08	0.50	107.64	
172.00	0.08	349.21	172.00	0.49 N	0.06 W	504,514.89	726,521.24	0.08	0.50	106.65	
174.00	0.08	350.22	174.00	0.50 N	0.06 W	504,514.90	726,521.24	0.08	0.50	105.65	
176.00	0.08	351.25	176.00	0.50 N	0.06 W	504,514.90	726,521.24	0.08	0.50	104.64	
178.00	0.08	352.28	178.00	0.50 N	0.06 W	504,514.90	726,521.24	0.08	0.51	103.62	
180.00	0.08	353.31	180.00	0.51 N	0.06 W	504,514.91	726,521.24	0.08	0.51	102.59	
182.00	0.08	354.36	182.00	0.51 N	0.06 W	504,514.91	726,521.24	0.08	0.51	101.55	
184.00	0.08	355.41	184.00	0.51 N	0.06 W	504,514.91	726,521.24	0.08	0.52	100.50	
186.00	0.08	356.47	186.00	0.51 N	0.06 W	504,514.91	726,521.24	0.08	0.52	99.45	
188.00	0.08	357.54	188.00	0.52 N	0.06 W	504,514.92	726,521.24	0.08	0.52	98.39	
190.00	0.08	358.61	190.00	0.52 N	0.06 W	504,514.92	726,521.24	0.08	0.52	97.33	
192.00	0.08	359.68	192.00	0.52 N	0.06 W	504,514.92	726,521.24	0.08	0.53	96.26	
194.00	0.08	0.76	194.00	0.53 N	0.06 W	504,514.93	726,521.24	0.08	0.53	95.18	
196.00	0.08	1.84	196.00	0.53 N	0.06 W	504,514.93	726,521.24	0.08	0.53	94.10	
198.00	0.08	2.93	198.00	0.53 N	0.06 W	504,514.93	726,521.24	0.08	0.53	93.02	
200.00	0.08	4.01	200.00	0.53 N	0.06 W	504,514.93	726,521.24	0.08	0.54	91.94	
202.00	0.08	5.10	202.00	0.54 N	0.06 W	504,514.94	726,521.24	0.08	0.54	90.85	
204.00	0.08	6.18	204.00	0.54 N	0.06 W	504,514.94	726,521.24	0.08	0.54	89.77	
206.00	0.08	6.80	206.00	0.54 N	0.06 W	504,514.94	726,521.24	0.04	0.55	88.68	
208.00	0.08	6.80	208.00	0.54 N	0.06 W	504,514.94	726,521.24	0.00	0.55	0.00	
210.00	0.08	6.80	210.00	0.55 N	0.06 W	504,514.95	726,521.24	0.00	0.55	0.00	
212.00	0.08	6.80	212.00	0.55 N	0.06 W	504,514.95	726,521.24	0.00	0.55	0.00	
214.00	0.09	9.38	214.00	0.55 N	0.06 W	504,514.95	726,521.24	0.32	0.56	36.56	
216.00	0.09	9.92	216.00	0.56 N	0.06 W	504,514.96	726,521.24	0.07	0.56	33.98	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
218.00	0.09	10.45	218.00	0.56 N	0.06 W	504,514.96	726,521.24	0.07	0.56	33.44	
220.00	0.09	10.96	220.00	0.56 N	0.06 W	504,514.96	726,521.24	0.07	0.57	32.91	
222.00	0.09	11.45	222.00	0.57 N	0.06 W	504,514.97	726,521.24	0.07	0.57	32.40	
224.00	0.09	11.94	224.00	0.57 N	0.06 W	504,514.97	726,521.24	0.07	0.57	31.91	
226.00	0.09	12.41	226.00	0.57 N	0.06 W	504,514.97	726,521.24	0.07	0.57	31.42	
228.00	0.09	12.86	228.00	0.57 N	0.06 W	504,514.97	726,521.24	0.07	0.58	30.95	
230.00	0.10	13.31	230.00	0.58 N	0.06 W	504,514.98	726,521.24	0.07	0.58	30.50	
232.00	0.10	13.74	232.00	0.58 N	0.06 W	504,514.98	726,521.24	0.07	0.58	30.05	
234.00	0.10	14.17	234.00	0.58 N	0.06 W	504,514.98	726,521.24	0.07	0.59	29.62	
236.00	0.10	14.58	236.00	0.59 N	0.05 W	504,514.99	726,521.25	0.07	0.59	29.19	
238.00	0.10	14.98	238.00	0.59 N	0.05 W	504,514.99	726,521.25	0.07	0.59	28.78	
240.00	0.10	15.37	240.00	0.59 N	0.05 W	504,514.99	726,521.25	0.07	0.60	28.38	
242.00	0.10	15.75	242.00	0.60 N	0.05 W	504,515.00	726,521.25	0.07	0.60	27.99	
244.00	0.10	16.12	244.00	0.60 N	0.05 W	504,515.00	726,521.25	0.07	0.60	27.61	
246.00	0.11	16.48	246.00	0.61 N	0.05 W	504,515.01	726,521.25	0.07	0.61	27.24	
248.00	0.11	16.84	248.00	0.61 N	0.05 W	504,515.01	726,521.25	0.07	0.61	26.88	
250.00	0.11	17.18	250.00	0.61 N	0.05 W	504,515.01	726,521.25	0.07	0.61	26.52	
252.00	0.11	17.52	252.00	0.62 N	0.05 W	504,515.02	726,521.25	0.07	0.62	26.18	
254.00	0.11	17.85	254.00	0.62 N	0.05 W	504,515.02	726,521.25	0.07	0.62	25.84	
256.00	0.11	18.17	256.00	0.62 N	0.04 W	504,515.02	726,521.26	0.07	0.62	25.51	
258.00	0.11	18.48	258.00	0.63 N	0.04 W	504,515.03	726,521.26	0.07	0.63	25.19	
260.00	0.11	18.79	260.00	0.63 N	0.04 W	504,515.03	726,521.26	0.07	0.63	24.88	
262.00	0.12	19.09	262.00	0.63 N	0.04 W	504,515.03	726,521.26	0.07	0.64	24.57	
264.00	0.12	19.38	264.00	0.64 N	0.04 W	504,515.04	726,521.26	0.07	0.64	24.27	
266.00	0.12	19.67	266.00	0.64 N	0.04 W	504,515.04	726,521.26	0.07	0.64	23.98	
268.00	0.12	19.95	268.00	0.65 N	0.04 W	504,515.05	726,521.26	0.07	0.65	23.69	
270.00	0.12	20.22	270.00	0.65 N	0.03 W	504,515.05	726,521.27	0.07	0.65	23.41	
272.00	0.12	20.49	272.00	0.65 N	0.03 W	504,515.05	726,521.27	0.07	0.65	23.14	
274.00	0.12	20.75	274.00	0.66 N	0.03 W	504,515.06	726,521.27	0.07	0.66	22.87	
276.00	0.13	21.01	276.00	0.66 N	0.03 W	504,515.06	726,521.27	0.07	0.66	22.61	
278.00	0.13	21.26	278.00	0.67 N	0.03 W	504,515.07	726,521.27	0.07	0.67	22.35	
280.00	0.13	21.50	280.00	0.67 N	0.03 W	504,515.07	726,521.27	0.07	0.67	22.10	
282.00	0.13	21.74	282.00	0.67 N	0.03 W	504,515.07	726,521.27	0.07	0.67	21.86	
284.00	0.13	21.98	284.00	0.68 N	0.02 W	504,515.08	726,521.28	0.07	0.68	21.62	
286.00	0.13	22.21	286.00	0.68 N	0.02 W	504,515.08	726,521.28	0.07	0.68	21.38	
288.00	0.13	22.44	288.00	0.69 N	0.02 W	504,515.09	726,521.28	0.07	0.69	21.15	



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Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
290.00	0.13	22.66	290.00	0.69 N	0.02 W	504,515.09	726,521.28	0.07	0.69	20.92	
292.00	0.14	22.87	292.00	0.70 N	0.02 W	504,515.10	726,521.28	0.07	0.69	20.70	
294.00	0.14	23.09	294.00	0.70 N	0.01 W	504,515.10	726,521.29	0.07	0.70	20.49	
296.00	0.14	23.29	296.00	0.71 N	0.01 W	504,515.11	726,521.29	0.07	0.70	20.27	
298.00	0.14	23.46	298.00	0.71 N	0.01 W	504,515.11	726,521.29	0.06	0.71	20.07	
300.00	0.14	23.46	300.00	0.71 N	0.01 W	504,515.11	726,521.29	0.00	0.71	0.00	
302.00	0.14	23.46	302.00	0.72 N	0.01 W	504,515.12	726,521.29	0.00	0.72	0.00	
304.00	0.14	23.46	304.00	0.72 N	0.00 W	504,515.12	726,521.30	0.00	0.72	0.00	
306.00	0.14	22.15	306.00	0.73 N	0.00 W	504,515.13	726,521.30	0.26	0.72	-38.76	
308.00	0.15	21.84	308.00	0.73 N	0.00 W	504,515.13	726,521.30	0.06	0.73	-37.45	
310.00	0.15	21.54	310.00	0.74 N	0.00 E	504,515.14	726,521.30	0.06	0.73	-37.15	
312.00	0.15	21.25	312.00	0.74 N	0.00 E	504,515.14	726,521.30	0.06	0.74	-36.85	
314.00	0.15	20.96	314.00	0.75 N	0.00 E	504,515.15	726,521.30	0.06	0.74	-36.55	
316.00	0.15	20.67	316.00	0.75 N	0.01 E	504,515.15	726,521.31	0.06	0.75	-36.26	
318.00	0.15	20.39	318.00	0.76 N	0.01 E	504,515.16	726,521.31	0.06	0.75	-35.98	
320.00	0.15	20.11	320.00	0.76 N	0.01 E	504,515.16	726,521.31	0.06	0.76	-35.70	
322.00	0.15	19.84	322.00	0.77 N	0.01 E	504,515.17	726,521.31	0.06	0.76	-35.42	
324.00	0.15	19.57	324.00	0.77 N	0.01 E	504,515.17	726,521.31	0.06	0.77	-35.14	
326.00	0.15	19.30	326.00	0.78 N	0.02 E	504,515.18	726,521.32	0.06	0.77	-34.87	
328.00	0.16	19.03	328.00	0.78 N	0.02 E	504,515.18	726,521.32	0.06	0.78	-34.60	
330.00	0.16	18.77	330.00	0.79 N	0.02 E	504,515.19	726,521.32	0.06	0.78	-34.34	
332.00	0.16	18.52	332.00	0.79 N	0.02 E	504,515.19	726,521.32	0.06	0.79	-34.08	
334.00	0.16	18.26	334.00	0.80 N	0.02 E	504,515.20	726,521.32	0.06	0.79	-33.82	
336.00	0.16	18.01	336.00	0.80 N	0.02 E	504,515.20	726,521.32	0.06	0.80	-33.57	
338.00	0.16	17.77	338.00	0.81 N	0.03 E	504,515.21	726,521.33	0.06	0.80	-33.32	
340.00	0.16	17.52	340.00	0.81 N	0.03 E	504,515.21	726,521.33	0.06	0.81	-33.07	
342.00	0.16	17.28	342.00	0.82 N	0.03 E	504,515.22	726,521.33	0.06	0.81	-32.83	
344.00	0.16	17.04	344.00	0.82 N	0.03 E	504,515.22	726,521.33	0.06	0.82	-32.59	
346.00	0.16	16.81	346.00	0.83 N	0.03 E	504,515.23	726,521.33	0.06	0.82	-32.35	
348.00	0.17	16.58	348.00	0.84 N	0.03 E	504,515.24	726,521.33	0.06	0.83	-32.11	
350.00	0.17	16.35	350.00	0.84 N	0.04 E	504,515.24	726,521.34	0.06	0.83	-31.88	
352.00	0.17	16.12	352.00	0.85 N	0.04 E	504,515.25	726,521.34	0.06	0.84	-31.65	
354.00	0.17	15.90	354.00	0.85 N	0.04 E	504,515.25	726,521.34	0.06	0.84	-31.43	
356.00	0.17	15.68	356.00	0.86 N	0.04 E	504,515.26	726,521.34	0.06	0.85	-31.21	
358.00	0.17	15.47	358.00	0.86 N	0.04 E	504,515.26	726,521.34	0.06	0.85	-30.99	
360.00	0.17	15.25	360.00	0.87 N	0.04 E	504,515.27	726,521.34	0.06	0.86	-30.77	
362.00	0.17	15.04	362.00	0.87 N	0.05 E	504,515.27	726,521.35	0.06	0.87	-30.56	



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Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
364.00	0.17	14.83	364.00	0.88 N	0.05 E	504,515.28	726,521.35	0.06	0.87	-30.34	
366.00	0.18	14.62	366.00	0.89 N	0.05 E	504,515.29	726,521.35	0.06	0.88	-30.13	
368.00	0.18	14.42	368.00	0.89 N	0.05 E	504,515.29	726,521.35	0.06	0.88	-29.93	
370.00	0.18	14.22	370.00	0.90 N	0.05 E	504,515.30	726,521.35	0.06	0.89	-29.72	
372.00	0.18	14.02	372.00	0.90 N	0.05 E	504,515.30	726,521.35	0.06	0.89	-29.52	
374.00	0.18	13.82	374.00	0.91 N	0.05 E	504,515.31	726,521.35	0.06	0.90	-29.32	
376.00	0.18	13.63	376.00	0.92 N	0.06 E	504,515.32	726,521.36	0.06	0.91	-29.13	
378.00	0.18	13.44	378.00	0.92 N	0.06 E	504,515.32	726,521.36	0.06	0.91	-28.93	
380.00	0.18	13.25	380.00	0.93 N	0.06 E	504,515.33	726,521.36	0.06	0.92	-28.74	
382.00	0.18	13.06	382.00	0.94 N	0.06 E	504,515.34	726,521.36	0.06	0.92	-28.55	
384.00	0.19	12.88	384.00	0.94 N	0.06 E	504,515.34	726,521.36	0.06	0.93	-28.37	
386.00	0.19	12.69	386.00	0.95 N	0.06 E	504,515.35	726,521.36	0.06	0.94	-28.18	
388.00	0.19	12.51	388.00	0.95 N	0.07 E	504,515.35	726,521.37	0.06	0.94	-28.00	
390.00	0.19	12.33	390.00	0.96 N	0.07 E	504,515.36	726,521.37	0.06	0.95	-27.82	
392.00	0.19	12.17	392.00	0.97 N	0.07 E	504,515.37	726,521.37	0.06	0.96	-27.64	
394.00	0.19	12.17	394.00	0.97 N	0.07 E	504,515.37	726,521.37	0.00	0.96	0.00	
396.00	0.19	12.17	396.00	0.98 N	0.07 E	504,515.38	726,521.37	0.00	0.97	0.00	
398.00	0.20	12.95	398.00	0.99 N	0.07 E	504,515.39	726,521.37	0.31	0.97	25.24	
400.00	0.20	13.20	400.00	0.99 N	0.07 E	504,515.39	726,521.37	0.10	0.98	24.46	
402.00	0.20	13.44	402.00	1.00 N	0.08 E	504,515.40	726,521.38	0.10	0.99	24.21	
404.00	0.20	13.67	404.00	1.01 N	0.08 E	504,515.41	726,521.38	0.10	0.99	23.97	
406.00	0.20	13.90	406.00	1.01 N	0.08 E	504,515.41	726,521.38	0.10	1.00	23.73	
408.00	0.21	14.13	408.00	1.02 N	0.08 E	504,515.42	726,521.38	0.10	1.01	23.50	
410.00	0.21	14.35	410.00	1.03 N	0.08 E	504,515.43	726,521.38	0.10	1.01	23.28	
412.00	0.21	14.57	412.00	1.04 N	0.08 E	504,515.44	726,521.38	0.10	1.02	23.05	
414.00	0.21	14.79	414.00	1.04 N	0.09 E	504,515.44	726,521.39	0.10	1.03	22.83	
416.00	0.21	15.00	416.00	1.05 N	0.09 E	504,515.45	726,521.39	0.10	1.04	22.62	
418.00	0.21	15.21	418.00	1.06 N	0.09 E	504,515.46	726,521.39	0.10	1.04	22.41	
420.00	0.22	15.41	420.00	1.06 N	0.09 E	504,515.46	726,521.39	0.10	1.05	22.20	
422.00	0.22	15.61	422.00	1.07 N	0.09 E	504,515.47	726,521.39	0.10	1.06	21.99	
424.00	0.22	15.81	424.00	1.08 N	0.10 E	504,515.48	726,521.40	0.10	1.06	21.79	
426.00	0.22	16.00	426.00	1.09 N	0.10 E	504,515.49	726,521.40	0.10	1.07	21.60	
428.00	0.22	16.20	428.00	1.09 N	0.10 E	504,515.49	726,521.40	0.10	1.08	21.40	
430.00	0.23	16.38	430.00	1.10 N	0.10 E	504,515.50	726,521.40	0.10	1.08	21.21	
432.00	0.23	16.57	432.00	1.11 N	0.10 E	504,515.51	726,521.40	0.10	1.09	21.02	
434.00	0.23	16.75	434.00	1.12 N	0.11 E	504,515.52	726,521.41	0.10	1.10	20.84	
436.00	0.23	16.93	436.00	1.12 N	0.11 E	504,515.52	726,521.41	0.10	1.11	20.66	

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Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
438.00	0.23	17.10	438.00	1.13 N	0.11 E	504,515.53	726,521.41	0.10	1.11	20.48	
440.00	0.24	17.27	440.00	1.14 N	0.11 E	504,515.54	726,521.41	0.10	1.12	20.31	
442.00	0.24	17.44	442.00	1.15 N	0.12 E	504,515.55	726,521.42	0.10	1.13	20.13	
444.00	0.24	17.61	444.00	1.16 N	0.12 E	504,515.56	726,521.42	0.10	1.14	19.96	
446.00	0.24	17.77	446.00	1.16 N	0.12 E	504,515.56	726,521.42	0.10	1.14	19.80	
448.00	0.24	17.94	448.00	1.17 N	0.12 E	504,515.57	726,521.42	0.10	1.15	19.63	
450.00	0.24	18.10	450.00	1.18 N	0.13 E	504,515.58	726,521.43	0.10	1.16	19.47	
452.00	0.25	18.25	452.00	1.19 N	0.13 E	504,515.59	726,521.43	0.10	1.17	19.31	
454.00	0.25	18.41	454.00	1.20 N	0.13 E	504,515.60	726,521.43	0.10	1.18	19.16	
456.00	0.25	18.56	456.00	1.20 N	0.13 E	504,515.60	726,521.43	0.10	1.18	19.00	
458.00	0.25	18.71	458.00	1.21 N	0.14 E	504,515.61	726,521.44	0.10	1.19	18.85	
460.00	0.25	18.85	460.00	1.22 N	0.14 E	504,515.62	726,521.44	0.10	1.20	18.70	
462.00	0.26	19.00	462.00	1.23 N	0.14 E	504,515.63	726,521.44	0.10	1.21	18.55	
464.00	0.26	19.14	464.00	1.24 N	0.15 E	504,515.64	726,521.45	0.10	1.22	18.41	
466.00	0.26	19.28	466.00	1.25 N	0.15 E	504,515.65	726,521.45	0.10	1.22	18.26	
468.00	0.26	19.42	468.00	1.25 N	0.15 E	504,515.65	726,521.45	0.10	1.23	18.12	
470.00	0.26	19.56	470.00	1.26 N	0.16 E	504,515.66	726,521.46	0.10	1.24	17.99	
472.00	0.27	19.69	472.00	1.27 N	0.16 E	504,515.67	726,521.46	0.10	1.25	17.85	
474.00	0.27	19.83	474.00	1.28 N	0.16 E	504,515.68	726,521.46	0.10	1.26	17.71	
476.00	0.27	19.96	476.00	1.29 N	0.16 E	504,515.69	726,521.46	0.10	1.27	17.58	
478.00	0.27	20.09	478.00	1.30 N	0.17 E	504,515.70	726,521.47	0.10	1.27	17.45	
480.00	0.27	20.21	480.00	1.31 N	0.17 E	504,515.71	726,521.47	0.10	1.28	17.32	
482.00	0.28	20.34	482.00	1.32 N	0.17 E	504,515.72	726,521.47	0.10	1.29	17.20	
484.00	0.28	20.46	484.00	1.33 N	0.18 E	504,515.73	726,521.48	0.10	1.30	17.07	
486.00	0.28	20.58	486.00	1.33 N	0.18 E	504,515.73	726,521.48	0.10	1.31	16.95	
488.00	0.28	20.59	488.00	1.34 N	0.18 E	504,515.74	726,521.48	0.01	1.32	16.82	
490.00	0.28	20.59	490.00	1.35 N	0.19 E	504,515.75	726,521.49	0.00	1.33	0.00	
492.00	0.28	21.30	492.00	1.36 N	0.19 E	504,515.76	726,521.49	0.27	1.34	40.75	
494.00	0.29	21.54	494.00	1.37 N	0.20 E	504,515.77	726,521.50	0.09	1.34	40.04	
496.00	0.29	21.77	496.00	1.38 N	0.20 E	504,515.78	726,521.50	0.09	1.35	39.81	
498.00	0.29	22.00	498.00	1.39 N	0.20 E	504,515.79	726,521.50	0.09	1.36	39.57	
500.00	0.29	22.23	500.00	1.40 N	0.21 E	504,515.80	726,521.51	0.09	1.37	39.34	
502.00	0.29	22.46	502.00	1.41 N	0.21 E	504,515.81	726,521.51	0.09	1.38	39.11	
504.00	0.29	22.68	504.00	1.42 N	0.21 E	504,515.82	726,521.51	0.09	1.39	38.88	
506.00	0.29	22.91	506.00	1.43 N	0.22 E	504,515.83	726,521.52	0.09	1.40	38.66	
508.00	0.30	23.13	508.00	1.44 N	0.22 E	504,515.84	726,521.52	0.09	1.41	38.43	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
510.00	0.30	23.35	510.00	1.45 N	0.23 E	504,515.85	726,521.53	0.09	1.42	38.21	
512.00	0.30	23.56	512.00	1.46 N	0.23 E	504,515.86	726,521.53	0.09	1.43	37.99	
514.00	0.30	23.78	514.00	1.47 N	0.24 E	504,515.87	726,521.54	0.09	1.43	37.78	
516.00	0.30	23.99	516.00	1.48 N	0.24 E	504,515.88	726,521.54	0.09	1.44	37.56	
518.00	0.30	24.20	518.00	1.49 N	0.24 E	504,515.89	726,521.54	0.09	1.45	37.35	
520.00	0.30	24.41	520.00	1.49 N	0.25 E	504,515.89	726,521.55	0.09	1.46	37.14	
522.00	0.31	24.62	522.00	1.50 N	0.25 E	504,515.90	726,521.55	0.09	1.47	36.93	
524.00	0.31	24.82	524.00	1.51 N	0.26 E	504,515.91	726,521.56	0.09	1.48	36.73	
526.00	0.31	25.02	526.00	1.52 N	0.26 E	504,515.92	726,521.56	0.09	1.49	36.52	
528.00	0.31	25.22	528.00	1.53 N	0.27 E	504,515.93	726,521.57	0.09	1.50	36.32	
530.00	0.31	25.42	530.00	1.54 N	0.27 E	504,515.94	726,521.57	0.09	1.51	36.12	
532.00	0.31	25.62	532.00	1.55 N	0.28 E	504,515.95	726,521.58	0.09	1.52	35.92	
534.00	0.31	25.81	534.00	1.56 N	0.28 E	504,515.96	726,521.58	0.09	1.53	35.72	
536.00	0.32	26.01	536.00	1.57 N	0.28 E	504,515.97	726,521.58	0.09	1.54	35.53	
538.00	0.32	26.20	538.00	1.58 N	0.29 E	504,515.98	726,521.59	0.09	1.55	35.34	
540.00	0.32	26.39	540.00	1.59 N	0.29 E	504,515.99	726,521.59	0.09	1.55	35.14	
542.00	0.32	26.57	542.00	1.60 N	0.30 E	504,516.00	726,521.60	0.09	1.56	34.95	
544.00	0.32	26.76	544.00	1.61 N	0.30 E	504,516.01	726,521.60	0.09	1.57	34.77	
546.00	0.32	26.94	546.00	1.62 N	0.31 E	504,516.02	726,521.61	0.09	1.58	34.58	
548.00	0.33	27.13	548.00	1.63 N	0.31 E	504,516.03	726,521.61	0.09	1.59	34.40	
550.00	0.33	27.31	550.00	1.64 N	0.32 E	504,516.04	726,521.62	0.09	1.60	34.21	
552.00	0.33	27.49	552.00	1.65 N	0.33 E	504,516.05	726,521.63	0.09	1.61	34.03	
554.00	0.33	27.66	554.00	1.66 N	0.33 E	504,516.06	726,521.63	0.09	1.62	33.85	
556.00	0.33	27.84	556.00	1.67 N	0.34 E	504,516.07	726,521.64	0.09	1.63	33.68	
558.00	0.33	28.01	558.00	1.68 N	0.34 E	504,516.08	726,521.64	0.09	1.64	33.50	
560.00	0.33	28.19	560.00	1.69 N	0.35 E	504,516.09	726,521.65	0.09	1.65	33.33	
562.00	0.34	28.36	562.00	1.70 N	0.35 E	504,516.10	726,521.65	0.09	1.66	33.15	
564.00	0.34	28.53	564.00	1.71 N	0.36 E	504,516.11	726,521.66	0.09	1.67	32.98	
566.00	0.34	28.69	566.00	1.73 N	0.36 E	504,516.13	726,521.66	0.09	1.68	32.81	
568.00	0.34	28.86	568.00	1.74 N	0.37 E	504,516.14	726,521.67	0.09	1.69	32.65	
570.00	0.34	29.03	570.00	1.75 N	0.38 E	504,516.15	726,521.68	0.09	1.70	32.48	
572.00	0.34	29.19	572.00	1.76 N	0.38 E	504,516.16	726,521.68	0.09	1.71	32.32	
574.00	0.35	29.35	574.00	1.77 N	0.39 E	504,516.17	726,521.69	0.09	1.72	32.15	
576.00	0.35	29.51	576.00	1.78 N	0.39 E	504,516.18	726,521.69	0.09	1.73	31.99	
578.00	0.35	29.67	578.00	1.79 N	0.40 E	504,516.19	726,521.70	0.09	1.74	31.83	
580.00	0.35	29.83	580.00	1.80 N	0.40 E	504,516.20	726,521.70	0.09	1.75	31.67	
582.00	0.35	28.31	582.00	1.81 N	0.41 E	504,516.21	726,521.71	0.47	1.76	-80.55	

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Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
584.00	0.35	26.40	584.00	1.82 N	0.42 E	504,516.22	726,521.72	0.60	1.77	-81.07	
586.00	0.36	24.51	586.00	1.83 N	0.42 E	504,516.23	726,521.72	0.60	1.78	-79.16	
588.00	0.36	22.65	588.00	1.84 N	0.43 E	504,516.24	726,521.73	0.60	1.79	-77.27	
590.00	0.36	20.82	590.00	1.85 N	0.43 E	504,516.25	726,521.73	0.60	1.80	-75.41	
592.00	0.37	19.03	592.00	1.87 N	0.44 E	504,516.27	726,521.74	0.60	1.81	-73.58	
594.00	0.37	17.27	594.00	1.88 N	0.44 E	504,516.28	726,521.74	0.60	1.82	-71.78	
596.00	0.37	15.54	596.00	1.89 N	0.44 E	504,516.29	726,521.74	0.60	1.84	-70.02	
598.00	0.38	13.86	598.00	1.90 N	0.45 E	504,516.30	726,521.75	0.60	1.85	-68.30	
600.00	0.38	12.22	600.00	1.92 N	0.45 E	504,516.32	726,521.75	0.60	1.86	-66.62	
602.00	0.39	10.63	602.00	1.93 N	0.45 E	504,516.33	726,521.75	0.60	1.87	-64.98	
604.00	0.39	9.07	604.00	1.94 N	0.45 E	504,516.34	726,521.75	0.60	1.89	-63.38	
606.00	0.40	7.56	606.00	1.96 N	0.46 E	504,516.36	726,521.76	0.60	1.90	-61.83	
608.00	0.41	6.10	608.00	1.97 N	0.46 E	504,516.37	726,521.76	0.60	1.91	-60.32	
610.00	0.41	4.68	610.00	1.99 N	0.46 E	504,516.39	726,521.76	0.60	1.93	-58.85	
612.00	0.42	3.30	612.00	2.00 N	0.46 E	504,516.40	726,521.76	0.60	1.94	-57.43	
614.00	0.43	1.96	614.00	2.01 N	0.46 E	504,516.41	726,521.76	0.60	1.96	-56.05	
616.00	0.43	0.67	616.00	2.03 N	0.46 E	504,516.43	726,521.76	0.60	1.97	-54.72	
618.00	0.44	359.42	618.00	2.04 N	0.46 E	504,516.44	726,521.76	0.60	1.99	-53.43	
620.00	0.45	358.21	620.00	2.06 N	0.46 E	504,516.46	726,521.76	0.60	2.00	-52.18	
622.00	0.45	357.04	622.00	2.08 N	0.46 E	504,516.48	726,521.76	0.60	2.02	-50.97	
624.00	0.46	355.91	624.00	2.09 N	0.46 E	504,516.49	726,521.76	0.60	2.03	-49.80	
626.00	0.47	354.82	625.99	2.11 N	0.46 E	504,516.51	726,521.76	0.60	2.05	-48.67	
628.00	0.48	353.76	627.99	2.12 N	0.46 E	504,516.52	726,521.76	0.60	2.07	-47.57	
630.00	0.49	352.74	629.99	2.14 N	0.45 E	504,516.54	726,521.75	0.60	2.08	-46.52	
632.00	0.50	351.76	631.99	2.16 N	0.45 E	504,516.56	726,521.75	0.60	2.10	-45.50	
634.00	0.50	350.80	633.99	2.18 N	0.45 E	504,516.58	726,521.75	0.60	2.12	-44.51	
636.00	0.51	349.88	635.99	2.19 N	0.45 E	504,516.59	726,521.75	0.60	2.14	-43.56	
638.00	0.52	348.99	637.99	2.21 N	0.44 E	504,516.61	726,521.74	0.60	2.15	-42.64	
640.00	0.53	348.14	639.99	2.23 N	0.44 E	504,516.63	726,521.74	0.60	2.17	-41.75	
642.00	0.54	347.30	641.99	2.25 N	0.44 E	504,516.65	726,521.74	0.60	2.19	-40.89	
644.00	0.55	346.50	643.99	2.27 N	0.43 E	504,516.67	726,521.73	0.60	2.21	-40.06	
646.00	0.56	345.73	645.99	2.28 N	0.43 E	504,516.68	726,521.73	0.60	2.23	-39.26	
648.00	0.57	344.98	647.99	2.30 N	0.42 E	504,516.70	726,521.72	0.60	2.25	-38.48	
650.00	0.58	344.25	649.99	2.32 N	0.42 E	504,516.72	726,521.72	0.60	2.27	-37.73	
652.00	0.59	343.55	651.99	2.34 N	0.41 E	504,516.74	726,521.71	0.60	2.29	-37.01	
654.00	0.60	342.87	653.99	2.36 N	0.41 E	504,516.76	726,521.71	0.60	2.31	-36.30	
656.00	0.61	342.21	655.99	2.38 N	0.40 E	504,516.78	726,521.70	0.60	2.33	-35.62	

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Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
658.00	0.62	341.57	657.99	2.40 N	0.39 E	504,516.80	726,521.69	0.60	2.35	-34.97	
660.00	0.63	340.95	659.99	2.42 N	0.39 E	504,516.82	726,521.69	0.60	2.37	-34.33	
662.00	0.64	340.36	661.99	2.44 N	0.38 E	504,516.84	726,521.68	0.60	2.39	-33.71	
664.00	0.65	339.78	663.99	2.46 N	0.37 E	504,516.86	726,521.67	0.60	2.41	-33.11	
666.00	0.66	339.22	665.99	2.49 N	0.36 E	504,516.89	726,521.66	0.60	2.44	-32.53	
668.00	0.67	338.67	667.99	2.51 N	0.35 E	504,516.91	726,521.65	0.60	2.46	-31.97	
670.00	0.68	338.14	669.99	2.53 N	0.35 E	504,516.93	726,521.65	0.60	2.48	-31.43	
672.00	0.69	337.63	671.99	2.55 N	0.34 E	504,516.95	726,521.64	0.60	2.50	-30.90	
674.00	0.70	337.14	673.99	2.57 N	0.33 E	504,516.97	726,521.63	0.60	2.53	-30.39	
676.00	0.71	336.17	675.99	2.60 N	0.32 E	504,517.00	726,521.62	0.74	2.55	-53.11	
678.00	0.71	334.99	677.99	2.62 N	0.31 E	504,517.02	726,521.61	0.85	2.57	-60.38	
680.00	0.72	333.84	679.99	2.64 N	0.30 E	504,517.04	726,521.60	0.85	2.60	-59.20	
682.00	0.73	332.72	681.99	2.66 N	0.29 E	504,517.06	726,521.59	0.85	2.62	-58.04	
684.00	0.74	331.62	683.99	2.69 N	0.27 E	504,517.09	726,521.57	0.85	2.64	-56.92	
686.00	0.75	330.55	685.99	2.71 N	0.26 E	504,517.11	726,521.56	0.85	2.67	-55.82	
688.00	0.76	329.51	687.99	2.73 N	0.25 E	504,517.13	726,521.55	0.85	2.69	-54.75	
690.00	0.77	328.49	689.99	2.75 N	0.23 E	504,517.15	726,521.53	0.85	2.72	-53.71	
692.00	0.78	327.51	691.99	2.78 N	0.22 E	504,517.18	726,521.52	0.85	2.74	-52.70	
694.00	0.79	326.54	693.99	2.80 N	0.20 E	504,517.20	726,521.50	0.85	2.77	-51.71	
696.00	0.80	325.61	695.99	2.82 N	0.19 E	504,517.22	726,521.49	0.85	2.79	-50.75	
698.00	0.81	324.70	697.99	2.85 N	0.17 E	504,517.25	726,521.47	0.85	2.81	-49.81	
700.00	0.83	323.81	699.99	2.87 N	0.16 E	504,517.27	726,521.46	0.85	2.84	-48.90	
702.00	0.84	322.95	701.99	2.89 N	0.14 E	504,517.29	726,521.44	0.85	2.86	-48.01	
704.00	0.85	322.11	703.99	2.92 N	0.12 E	504,517.32	726,521.42	0.85	2.89	-47.15	
706.00	0.86	321.29	705.99	2.94 N	0.10 E	504,517.34	726,521.40	0.85	2.91	-46.31	
708.00	0.87	320.50	707.99	2.96 N	0.08 E	504,517.36	726,521.38	0.85	2.94	-45.50	
710.00	0.88	319.73	709.99	2.99 N	0.06 E	504,517.39	726,521.36	0.85	2.97	-44.70	
712.00	0.90	318.98	711.99	3.01 N	0.04 E	504,517.41	726,521.34	0.85	2.99	-43.93	
714.00	0.91	318.25	713.99	3.03 N	0.02 E	504,517.43	726,521.32	0.85	3.02	-43.18	
716.00	0.92	317.54	715.99	3.06 N	0.00 E	504,517.46	726,521.30	0.85	3.04	-42.45	
718.00	0.93	316.84	717.99	3.08 N	0.02 W	504,517.48	726,521.28	0.85	3.07	-41.74	
720.00	0.95	316.17	719.99	3.11 N	0.04 W	504,517.51	726,521.26	0.85	3.09	-41.05	
722.00	0.96	315.52	721.99	3.13 N	0.07 W	504,517.53	726,521.23	0.85	3.12	-40.37	
724.00	0.97	314.88	723.99	3.15 N	0.09 W	504,517.55	726,521.21	0.85	3.15	-39.72	
726.00	0.99	314.26	725.99	3.18 N	0.11 W	504,517.58	726,521.19	0.85	3.17	-39.08	
728.00	1.00	313.65	727.99	3.20 N	0.14 W	504,517.60	726,521.16	0.85	3.20	-38.46	

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				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
730.00	1.01	313.07	729.99	3.23 N	0.17 W	504,517.63	726,521.13	0.85	3.23	-37.86	
732.00	1.03	312.49	731.99	3.25 N	0.19 W	504,517.65	726,521.11	0.85	3.25	-37.27	
734.00	1.04	311.94	733.99	3.27 N	0.22 W	504,517.67	726,521.08	0.85	3.28	-36.70	
736.00	1.05	311.39	735.99	3.30 N	0.25 W	504,517.70	726,521.05	0.85	3.31	-36.14	
738.00	1.07	310.86	737.99	3.32 N	0.27 W	504,517.72	726,521.03	0.85	3.33	-35.60	
740.00	1.08	310.35	739.98	3.35 N	0.30 W	504,517.75	726,521.00	0.85	3.36	-35.07	
742.00	1.10	309.85	741.98	3.37 N	0.33 W	504,517.77	726,520.97	0.85	3.39	-34.55	
744.00	1.11	309.36	743.98	3.40 N	0.36 W	504,517.80	726,520.94	0.85	3.41	-34.05	
746.00	1.12	308.88	745.98	3.42 N	0.39 W	504,517.82	726,520.91	0.85	3.44	-33.56	
748.00	1.14	308.41	747.98	3.44 N	0.42 W	504,517.84	726,520.88	0.85	3.47	-33.08	
750.00	1.15	307.96	749.98	3.47 N	0.45 W	504,517.87	726,520.85	0.85	3.50	-32.62	
752.00	1.17	307.52	751.98	3.49 N	0.48 W	504,517.89	726,520.82	0.85	3.53	-32.16	
754.00	1.18	307.08	753.98	3.52 N	0.52 W	504,517.92	726,520.78	0.85	3.55	-31.72	
756.00	1.20	306.66	755.98	3.54 N	0.55 W	504,517.94	726,520.75	0.85	3.58	-31.29	
758.00	1.21	306.25	757.98	3.57 N	0.58 W	504,517.97	726,520.72	0.85	3.61	-30.87	
760.00	1.22	305.85	759.98	3.59 N	0.62 W	504,517.99	726,520.68	0.85	3.64	-30.46	
762.00	1.24	305.46	761.98	3.62 N	0.65 W	504,518.02	726,520.65	0.85	3.67	-30.06	
764.00	1.25	305.07	763.98	3.64 N	0.69 W	504,518.04	726,520.61	0.85	3.70	-29.66	
766.00	1.27	304.70	765.98	3.67 N	0.73 W	504,518.07	726,520.57	0.85	3.72	-29.28	
768.00	1.28	304.33	767.98	3.69 N	0.76 W	504,518.09	726,520.54	0.85	3.75	-28.91	
770.00	1.29	304.18	769.98	3.72 N	0.80 W	504,518.12	726,520.50	0.36	3.78	-28.54	
772.00	1.30	304.43	771.98	3.75 N	0.84 W	504,518.15	726,520.46	0.60	3.81	27.60	
774.00	1.31	304.58	773.98	3.77 N	0.87 W	504,518.17	726,520.43	0.38	3.84	27.35	
776.00	1.31	304.73	775.98	3.80 N	0.91 W	504,518.20	726,520.39	0.38	3.87	27.19	
778.00	1.32	304.89	777.98	3.82 N	0.95 W	504,518.22	726,520.35	0.38	3.90	27.04	
780.00	1.33	305.04	779.98	3.85 N	0.99 W	504,518.25	726,520.31	0.38	3.93	26.89	
782.00	1.33	305.18	781.98	3.88 N	1.03 W	504,518.28	726,520.27	0.38	3.96	26.74	
784.00	1.34	305.33	783.97	3.90 N	1.06 W	504,518.30	726,520.24	0.38	3.99	26.59	
786.00	1.35	305.48	785.97	3.93 N	1.10 W	504,518.33	726,520.20	0.38	4.02	26.44	
788.00	1.36	305.62	787.97	3.96 N	1.14 W	504,518.36	726,520.16	0.38	4.05	26.30	
790.00	1.36	305.76	789.97	3.99 N	1.18 W	504,518.39	726,520.12	0.38	4.08	26.16	
792.00	1.37	305.90	791.97	4.01 N	1.22 W	504,518.41	726,520.08	0.38	4.12	26.01	
794.00	1.38	306.04	793.97	4.04 N	1.26 W	504,518.44	726,520.04	0.38	4.15	25.87	
796.00	1.38	306.18	795.97	4.07 N	1.30 W	504,518.47	726,520.00	0.38	4.18	25.73	
798.00	1.39	306.32	797.97	4.10 N	1.33 W	504,518.50	726,519.97	0.38	4.21	25.59	
800.00	1.40	306.45	799.97	4.13 N	1.37 W	504,518.53	726,519.93	0.38	4.25	25.46	
802.00	1.40	306.59	801.97	4.16 N	1.41 W	504,518.56	726,519.89	0.38	4.28	25.32	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
804.00	1.41	306.72	803.97	4.19 N	1.45 W	504,518.59	726,519.85	0.38	4.31	25.19	
806.00	1.42	306.85	805.97	4.22 N	1.49 W	504,518.62	726,519.81	0.38	4.35	25.05	
808.00	1.43	306.98	807.97	4.25 N	1.53 W	504,518.65	726,519.77	0.38	4.38	24.92	
810.00	1.43	307.11	809.97	4.28 N	1.57 W	504,518.68	726,519.73	0.38	4.41	24.79	
812.00	1.44	307.24	811.97	4.31 N	1.61 W	504,518.71	726,519.69	0.38	4.45	24.66	
814.00	1.45	307.37	813.97	4.34 N	1.65 W	504,518.74	726,519.65	0.38	4.48	24.54	
816.00	1.45	307.49	815.96	4.37 N	1.69 W	504,518.77	726,519.61	0.38	4.52	24.41	
818.00	1.46	307.62	817.96	4.40 N	1.73 W	504,518.80	726,519.57	0.38	4.55	24.28	
820.00	1.47	307.74	819.96	4.43 N	1.77 W	504,518.83	726,519.53	0.38	4.59	24.16	
822.00	1.47	307.86	821.96	4.46 N	1.81 W	504,518.86	726,519.49	0.38	4.62	24.04	
824.00	1.48	307.98	823.96	4.49 N	1.85 W	504,518.89	726,519.45	0.38	4.66	23.92	
826.00	1.49	308.10	825.96	4.52 N	1.89 W	504,518.92	726,519.41	0.38	4.69	23.80	
828.00	1.50	308.22	827.96	4.56 N	1.93 W	504,518.96	726,519.37	0.38	4.73	23.68	
830.00	1.50	308.34	829.96	4.59 N	1.98 W	504,518.99	726,519.32	0.38	4.77	23.56	
832.00	1.51	308.45	831.96	4.62 N	2.02 W	504,519.02	726,519.28	0.38	4.80	23.44	
834.00	1.52	308.57	833.96	4.65 N	2.06 W	504,519.05	726,519.24	0.38	4.84	23.32	
836.00	1.52	308.68	835.96	4.69 N	2.10 W	504,519.09	726,519.20	0.38	4.88	23.21	
838.00	1.53	308.79	837.96	4.72 N	2.14 W	504,519.12	726,519.16	0.38	4.91	23.10	
840.00	1.54	308.91	839.96	4.75 N	2.18 W	504,519.15	726,519.12	0.38	4.95	22.98	
842.00	1.54	309.02	841.96	4.79 N	2.22 W	504,519.19	726,519.08	0.38	4.99	22.87	
844.00	1.55	309.13	843.96	4.82 N	2.27 W	504,519.22	726,519.03	0.38	5.03	22.76	
846.00	1.56	309.24	845.95	4.86 N	2.31 W	504,519.26	726,518.99	0.38	5.07	22.65	
848.00	1.57	309.34	847.95	4.89 N	2.35 W	504,519.29	726,518.95	0.38	5.10	22.54	
850.00	1.57	309.45	849.95	4.93 N	2.39 W	504,519.33	726,518.91	0.38	5.14	22.43	
852.00	1.58	309.56	851.95	4.96 N	2.44 W	504,519.36	726,518.86	0.38	5.18	22.33	
854.00	1.59	309.66	853.95	5.00 N	2.48 W	504,519.40	726,518.82	0.38	5.22	22.22	
856.00	1.59	309.76	855.95	5.03 N	2.52 W	504,519.43	726,518.78	0.38	5.26	22.12	
858.00	1.60	309.87	857.95	5.07 N	2.56 W	504,519.47	726,518.74	0.38	5.30	22.01	
860.00	1.61	309.97	859.95	5.10 N	2.61 W	504,519.50	726,518.69	0.38	5.34	21.91	
862.00	1.62	310.07	861.95	5.14 N	2.65 W	504,519.54	726,518.65	0.38	5.38	21.81	
864.00	1.62	310.17	863.95	5.18 N	2.69 W	504,519.58	726,518.61	0.38	5.42	21.71	
865.98	1.63	310.27	865.93	5.21 N	2.74 W	504,519.61	726,518.56	0.38	5.46	21.61	Last Gyro @ 865.98'MD
866.00	1.63	310.27	865.95	5.21 N	2.74 W	504,519.61	726,518.56	0.00	5.46	0.00	
868.00	1.63	310.50	867.95	5.25 N	2.78 W	504,519.65	726,518.52	0.34	5.50	73.68	
870.00	1.63	310.73	869.95	5.29 N	2.82 W	504,519.69	726,518.48	0.34	5.55	73.45	
872.00	1.64	310.95	871.94	5.32 N	2.87 W	504,519.72	726,518.43	0.34	5.59	73.22	
874.00	1.64	311.18	873.94	5.36 N	2.91 W	504,519.76	726,518.39	0.34	5.63	73.00	



Eddy County, NM (NAD83)

Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
876.00	1.64	311.40	875.94	5.40 N	2.95 W	504,519.80	726,518.35	0.34	5.67	72.77	
878.00	1.64	311.63	877.94	5.44 N	3.00 W	504,519.84	726,518.30	0.34	5.71	72.55	
880.00	1.64	311.85	879.94	5.48 N	3.04 W	504,519.88	726,518.26	0.34	5.76	72.32	
882.00	1.65	312.08	881.94	5.51 N	3.08 W	504,519.91	726,518.22	0.34	5.80	72.10	
884.00	1.65	312.30	883.94	5.55 N	3.12 W	504,519.95	726,518.18	0.34	5.84	71.87	
886.00	1.65	312.52	885.94	5.59 N	3.17 W	504,519.99	726,518.13	0.34	5.88	71.65	
888.00	1.65	312.74	887.94	5.63 N	3.21 W	504,520.03	726,518.09	0.34	5.93	71.43	
890.00	1.65	312.96	889.94	5.67 N	3.25 W	504,520.07	726,518.05	0.34	5.97	71.21	
892.00	1.66	313.18	891.94	5.71 N	3.29 W	504,520.11	726,518.01	0.34	6.01	70.99	
894.00	1.66	313.40	893.94	5.75 N	3.34 W	504,520.15	726,517.96	0.34	6.06	70.77	
896.00	1.66	313.62	895.93	5.79 N	3.38 W	504,520.19	726,517.92	0.34	6.10	70.55	
898.00	1.66	313.84	897.93	5.83 N	3.42 W	504,520.23	726,517.88	0.34	6.15	70.33	
900.00	1.67	314.06	899.93	5.87 N	3.46 W	504,520.27	726,517.84	0.34	6.19	70.11	
902.00	1.67	314.28	901.93	5.91 N	3.50 W	504,520.31	726,517.80	0.34	6.23	69.89	
904.00	1.67	314.49	903.93	5.95 N	3.54 W	504,520.35	726,517.76	0.34	6.28	69.67	
906.00	1.67	314.71	905.93	5.99 N	3.59 W	504,520.39	726,517.71	0.34	6.32	69.46	
908.00	1.68	314.93	907.93	6.03 N	3.63 W	504,520.43	726,517.67	0.34	6.37	69.24	
910.00	1.68	315.14	909.93	6.07 N	3.67 W	504,520.47	726,517.63	0.34	6.41	69.02	
912.00	1.68	315.36	911.93	6.12 N	3.71 W	504,520.52	726,517.59	0.34	6.46	68.81	
914.00	1.68	315.57	913.93	6.16 N	3.75 W	504,520.56	726,517.55	0.34	6.51	68.59	
916.00	1.69	315.78	915.93	6.20 N	3.79 W	504,520.60	726,517.51	0.34	6.55	68.38	
918.00	1.69	316.00	917.93	6.24 N	3.83 W	504,520.64	726,517.47	0.34	6.60	68.17	
920.00	1.69	316.21	919.92	6.28 N	3.87 W	504,520.68	726,517.43	0.34	6.64	67.95	
922.00	1.69	316.42	921.92	6.33 N	3.91 W	504,520.73	726,517.39	0.34	6.69	67.74	
924.00	1.70	316.63	923.92	6.37 N	3.96 W	504,520.77	726,517.34	0.34	6.74	67.53	
926.00	1.70	316.84	925.92	6.41 N	4.00 W	504,520.81	726,517.30	0.34	6.78	67.32	
928.00	1.70	317.05	927.92	6.46 N	4.04 W	504,520.86	726,517.26	0.34	6.83	67.11	
930.00	1.70	317.26	929.92	6.50 N	4.08 W	504,520.90	726,517.22	0.34	6.88	66.90	
932.00	1.71	317.47	931.92	6.54 N	4.12 W	504,520.94	726,517.18	0.34	6.93	66.69	
934.00	1.71	317.67	933.92	6.59 N	4.16 W	504,520.99	726,517.14	0.34	6.97	66.49	
936.00	1.71	317.88	935.92	6.63 N	4.20 W	504,521.03	726,517.10	0.34	7.02	66.28	
938.00	1.71	318.09	937.92	6.68 N	4.24 W	504,521.08	726,517.06	0.34	7.07	66.07	
940.00	1.72	318.29	939.92	6.72 N	4.28 W	504,521.12	726,517.02	0.34	7.12	65.87	
942.00	1.72	318.50	941.91	6.77 N	4.32 W	504,521.17	726,516.98	0.34	7.17	65.66	
944.00	1.72	318.70	943.91	6.81 N	4.36 W	504,521.21	726,516.94	0.34	7.22	65.46	
946.00	1.73	318.90	945.91	6.86 N	4.40 W	504,521.26	726,516.90	0.34	7.27	65.25	



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				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
948.00	1.73	319.11	947.91	6.90 N	4.44 W	504,521.30	726,516.86	0.34	7.32	65.05	
950.00	1.73	319.31	949.91	6.95 N	4.48 W	504,521.35	726,516.82	0.34	7.36	64.85	
952.00	1.73	319.51	951.91	6.99 N	4.51 W	504,521.39	726,516.79	0.34	7.41	64.64	
954.00	1.74	319.71	953.91	7.04 N	4.55 W	504,521.44	726,516.75	0.34	7.46	64.44	
956.00	1.74	319.91	955.91	7.09 N	4.59 W	504,521.49	726,516.71	0.34	7.51	64.24	
958.00	1.74	320.11	957.91	7.13 N	4.63 W	504,521.53	726,516.67	0.34	7.56	64.04	
960.00	1.75	320.31	959.91	7.18 N	4.67 W	504,521.58	726,516.63	0.34	7.62	63.84	
962.00	1.75	320.51	961.91	7.23 N	4.71 W	504,521.63	726,516.59	0.34	7.67	63.64	
964.00	1.75	320.70	963.90	7.27 N	4.75 W	504,521.67	726,516.55	0.34	7.72	63.45	
966.00	1.75	320.90	965.90	7.32 N	4.79 W	504,521.72	726,516.51	0.34	7.77	63.25	
968.00	1.76	321.10	967.90	7.37 N	4.83 W	504,521.77	726,516.47	0.34	7.82	63.05	
970.00	1.76	321.29	969.90	7.42 N	4.86 W	504,521.82	726,516.44	0.34	7.87	62.86	
972.00	1.76	321.49	971.90	7.46 N	4.90 W	504,521.86	726,516.40	0.34	7.92	62.66	
974.00	1.77	321.68	973.90	7.51 N	4.94 W	504,521.91	726,516.36	0.34	7.97	62.47	
976.00	1.77	321.87	975.90	7.56 N	4.98 W	504,521.96	726,516.32	0.34	8.03	62.27	
978.00	1.77	322.07	977.90	7.61 N	5.02 W	504,522.01	726,516.28	0.34	8.08	62.08	
980.00	1.78	322.26	979.90	7.66 N	5.06 W	504,522.06	726,516.24	0.34	8.13	61.89	
982.00	1.78	322.45	981.90	7.71 N	5.09 W	504,522.11	726,516.21	0.34	8.18	61.69	
984.00	1.77	322.50	983.89	7.76 N	5.13 W	504,522.16	726,516.17	0.58	8.24	172.28	
986.00	1.76	322.55	985.89	7.81 N	5.17 W	504,522.21	726,516.13	0.58	8.29	172.23	
988.00	1.75	322.60	987.89	7.85 N	5.21 W	504,522.25	726,516.09	0.58	8.34	172.17	
990.00	1.73	322.66	989.89	7.90 N	5.24 W	504,522.30	726,516.06	0.58	8.39	172.12	
992.00	1.72	322.71	991.89	7.95 N	5.28 W	504,522.35	726,516.02	0.58	8.44	172.07	
994.00	1.71	322.76	993.89	8.00 N	5.32 W	504,522.40	726,515.98	0.58	8.50	172.02	
996.00	1.70	322.82	995.89	8.05 N	5.35 W	504,522.45	726,515.95	0.58	8.55	171.96	
998.00	1.69	322.87	997.89	8.09 N	5.39 W	504,522.49	726,515.91	0.58	8.60	171.91	
1,000.00	1.68	322.93	999.89	8.14 N	5.42 W	504,522.54	726,515.88	0.58	8.65	171.85	
1,002.00	1.66	322.99	1,001.89	8.19 N	5.46 W	504,522.59	726,515.84	0.58	8.70	171.80	
1,004.00	1.65	323.05	1,003.89	8.23 N	5.49 W	504,522.63	726,515.81	0.58	8.75	171.74	
1,006.00	1.64	323.11	1,005.89	8.28 N	5.53 W	504,522.68	726,515.77	0.58	8.80	171.68	
1,008.00	1.63	323.16	1,007.88	8.32 N	5.56 W	504,522.72	726,515.74	0.58	8.84	171.62	
1,010.00	1.62	323.23	1,009.88	8.37 N	5.60 W	504,522.77	726,515.70	0.58	8.89	171.56	
1,012.00	1.61	323.29	1,011.88	8.41 N	5.63 W	504,522.81	726,515.67	0.58	8.94	171.50	
1,014.00	1.60	323.35	1,013.88	8.46 N	5.66 W	504,522.86	726,515.64	0.58	8.99	171.44	
1,016.00	1.58	323.41	1,015.88	8.50 N	5.70 W	504,522.90	726,515.60	0.58	9.04	171.38	
1,018.00	1.57	323.48	1,017.88	8.55 N	5.73 W	504,522.95	726,515.57	0.58	9.08	171.31	
1,020.00	1.56	323.54	1,019.88	8.59 N	5.76 W	504,522.99	726,515.54	0.58	9.13	171.25	

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				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
1,022.00	1.55	323.61	1,021.88	8.64 N	5.79 W	504,523.04	726,515.51	0.58	9.18	171.19	
1,024.00	1.54	323.67	1,023.88	8.68 N	5.82 W	504,523.08	726,515.48	0.58	9.22	171.12	
1,026.00	1.53	323.74	1,025.88	8.72 N	5.86 W	504,523.12	726,515.44	0.58	9.27	171.05	
1,028.00	1.52	323.81	1,027.88	8.76 N	5.89 W	504,523.16	726,515.41	0.58	9.32	170.98	
1,030.00	1.50	323.88	1,029.88	8.81 N	5.92 W	504,523.21	726,515.38	0.58	9.36	170.92	
1,032.00	1.49	323.95	1,031.88	8.85 N	5.95 W	504,523.25	726,515.35	0.58	9.41	170.85	
1,034.00	1.48	324.02	1,033.87	8.89 N	5.98 W	504,523.29	726,515.32	0.58	9.45	170.77	
1,036.00	1.47	324.10	1,035.87	8.93 N	6.01 W	504,523.33	726,515.29	0.58	9.50	170.70	
1,038.00	1.46	324.17	1,037.87	8.97 N	6.04 W	504,523.37	726,515.26	0.58	9.54	170.63	
1,040.00	1.45	324.25	1,039.87	9.02 N	6.07 W	504,523.42	726,515.23	0.58	9.58	170.55	
1,042.00	1.43	324.33	1,041.87	9.06 N	6.10 W	504,523.46	726,515.20	0.58	9.63	170.48	
1,044.00	1.42	324.40	1,043.87	9.10 N	6.13 W	504,523.50	726,515.17	0.58	9.67	170.40	
1,046.00	1.41	324.48	1,045.87	9.14 N	6.16 W	504,523.54	726,515.14	0.58	9.71	170.32	
1,048.00	1.40	324.56	1,047.87	9.18 N	6.19 W	504,523.58	726,515.11	0.58	9.76	170.24	
1,050.00	1.39	324.65	1,049.87	9.22 N	6.21 W	504,523.62	726,515.09	0.58	9.80	170.16	
1,052.00	1.38	324.73	1,051.87	9.26 N	6.24 W	504,523.66	726,515.06	0.58	9.84	170.08	
1,054.00	1.37	324.81	1,053.87	9.30 N	6.27 W	504,523.70	726,515.03	0.58	9.88	170.00	
1,056.00	1.35	324.90	1,055.87	9.33 N	6.30 W	504,523.73	726,515.00	0.58	9.92	169.91	
1,058.00	1.34	324.99	1,057.87	9.37 N	6.32 W	504,523.77	726,514.98	0.58	9.97	169.83	
1,060.00	1.33	325.08	1,059.87	9.41 N	6.35 W	504,523.81	726,514.95	0.58	10.01	169.74	
1,062.00	1.32	325.17	1,061.87	9.45 N	6.38 W	504,523.85	726,514.92	0.58	10.05	169.65	
1,064.00	1.31	325.26	1,063.87	9.49 N	6.40 W	504,523.89	726,514.90	0.58	10.09	169.56	
1,066.00	1.30	325.35	1,065.87	9.52 N	6.43 W	504,523.92	726,514.87	0.58	10.13	169.47	
1,068.00	1.29	325.45	1,067.86	9.56 N	6.45 W	504,523.96	726,514.85	0.58	10.17	169.37	
1,070.00	1.27	325.55	1,069.86	9.60 N	6.48 W	504,524.00	726,514.82	0.58	10.21	169.28	
1,072.00	1.26	325.65	1,071.86	9.63 N	6.51 W	504,524.03	726,514.79	0.58	10.24	169.18	
1,074.00	1.25	325.75	1,073.86	9.67 N	6.53 W	504,524.07	726,514.77	0.58	10.28	169.08	
1,076.00	1.24	325.85	1,075.86	9.71 N	6.55 W	504,524.11	726,514.75	0.58	10.32	168.98	
1,078.00	1.21	326.06	1,077.86	9.74 N	6.58 W	504,524.14	726,514.72	1.46	10.36	171.03	
1,080.00	1.18	326.29	1,079.86	9.78 N	6.60 W	504,524.18	726,514.70	1.46	10.40	170.82	
1,082.00	1.15	326.53	1,081.86	9.81 N	6.62 W	504,524.21	726,514.68	1.46	10.43	170.59	
1,084.00	1.13	326.77	1,083.86	9.84 N	6.65 W	504,524.24	726,514.65	1.46	10.47	170.36	
1,086.00	1.10	327.04	1,085.86	9.88 N	6.67 W	504,524.28	726,514.63	1.46	10.50	170.11	
1,088.00	1.07	327.31	1,087.86	9.91 N	6.69 W	504,524.31	726,514.61	1.46	10.53	169.85	
1,090.00	1.04	327.60	1,089.86	9.94 N	6.71 W	504,524.34	726,514.59	1.46	10.57	169.57	
1,092.00	1.01	327.91	1,091.86	9.97 N	6.73 W	504,524.37	726,514.57	1.46	10.60	169.28	
1,094.00	0.98	328.23	1,093.86	10.00 N	6.74 W	504,524.40	726,514.56	1.46	10.63	168.97	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
1,096.00	0.95	328.58	1,095.86	10.03 N	6.76 W	504,524.43	726,514.54	1.46	10.66	168.65	
1,098.00	0.92	328.95	1,097.86	10.06 N	6.78 W	504,524.46	726,514.52	1.46	10.69	168.30	
1,100.00	0.90	329.33	1,099.86	10.08 N	6.80 W	504,524.48	726,514.50	1.46	10.72	167.94	
1,102.00	0.87	329.75	1,101.86	10.11 N	6.81 W	504,524.51	726,514.49	1.46	10.75	167.55	
1,104.00	0.84	330.19	1,103.86	10.14 N	6.83 W	504,524.54	726,514.47	1.46	10.77	167.14	
1,106.00	0.81	330.66	1,105.86	10.16 N	6.84 W	504,524.56	726,514.46	1.46	10.80	166.69	
1,108.00	0.78	331.17	1,107.86	10.19 N	6.85 W	504,524.59	726,514.45	1.46	10.83	166.22	
1,110.00	0.75	331.72	1,109.86	10.21 N	6.87 W	504,524.61	726,514.43	1.46	10.85	165.71	
1,112.00	0.73	332.31	1,111.86	10.23 N	6.88 W	504,524.63	726,514.42	1.46	10.88	165.17	
1,114.00	0.70	332.94	1,113.86	10.25 N	6.89 W	504,524.65	726,514.41	1.46	10.90	164.58	
1,116.00	0.67	333.63	1,115.86	10.27 N	6.90 W	504,524.67	726,514.40	1.46	10.92	163.94	
1,118.00	0.64	334.38	1,117.86	10.30 N	6.91 W	504,524.70	726,514.39	1.46	10.94	163.26	
1,120.00	0.62	335.19	1,119.86	10.32 N	6.92 W	504,524.72	726,514.38	1.46	10.96	162.51	
1,122.00	0.59	336.08	1,121.86	10.33 N	6.93 W	504,524.73	726,514.37	1.46	10.98	161.69	
1,124.00	0.56	337.06	1,123.86	10.35 N	6.94 W	504,524.75	726,514.36	1.46	11.00	160.80	
1,126.00	0.53	338.14	1,125.86	10.37 N	6.94 W	504,524.77	726,514.36	1.46	11.02	159.82	
1,128.00	0.51	339.34	1,127.86	10.39 N	6.95 W	504,524.79	726,514.35	1.46	11.04	158.74	
1,130.00	0.48	340.67	1,129.86	10.40 N	6.96 W	504,524.80	726,514.34	1.46	11.05	157.54	
1,132.00	0.45	342.16	1,131.86	10.42 N	6.96 W	504,524.82	726,514.34	1.46	11.07	156.21	
1,134.00	0.43	343.83	1,133.86	10.43 N	6.97 W	504,524.83	726,514.33	1.46	11.09	154.73	
1,136.00	0.40	345.71	1,135.86	10.45 N	6.97 W	504,524.85	726,514.33	1.46	11.10	153.06	
1,138.00	0.38	347.86	1,137.86	10.46 N	6.97 W	504,524.86	726,514.33	1.46	11.11	151.17	
1,140.00	0.35	350.31	1,139.86	10.47 N	6.98 W	504,524.87	726,514.32	1.46	11.13	149.03	
1,142.00	0.33	353.12	1,141.86	10.48 N	6.98 W	504,524.88	726,514.32	1.46	11.14	146.58	
1,144.00	0.30	356.37	1,143.86	10.50 N	6.98 W	504,524.90	726,514.32	1.46	11.15	143.77	
1,146.00	0.28	0.13	1,145.86	10.51 N	6.98 W	504,524.91	726,514.32	1.46	11.16	140.52	
1,148.00	0.26	4.50	1,147.86	10.52 N	6.98 W	504,524.92	726,514.32	1.46	11.17	136.75	
1,150.00	0.24	9.59	1,149.86	10.52 N	6.98 W	504,524.92	726,514.32	1.46	11.18	132.38	
1,152.00	0.23	15.46	1,151.86	10.53 N	6.98 W	504,524.93	726,514.32	1.46	11.18	127.30	
1,154.00	0.21	22.17	1,153.86	10.54 N	6.97 W	504,524.94	726,514.33	1.46	11.19	121.43	
1,156.00	0.20	29.68	1,155.86	10.55 N	6.97 W	504,524.95	726,514.33	1.46	11.20	114.72	
1,158.00	0.20	37.85	1,157.86	10.55 N	6.97 W	504,524.95	726,514.33	1.46	11.20	107.21	
1,160.00	0.19	46.41	1,159.86	10.56 N	6.96 W	504,524.96	726,514.34	1.46	11.21	99.03	
1,162.00	0.20	54.99	1,161.86	10.56 N	6.96 W	504,524.96	726,514.34	1.46	11.21	90.47	
1,164.00	0.20	63.23	1,163.86	10.56 N	6.95 W	504,524.96	726,514.35	1.46	11.21	81.89	
1,166.00	0.21	70.82	1,165.86	10.57 N	6.94 W	504,524.97	726,514.36	1.46	11.22	73.66	



Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
1,168.00	0.22	77.62	1,167.86	10.57 N	6.94 W	504,524.97	726,514.36	1.46	11.22	66.06	
1,170.00	0.24	83.58	1,169.86	10.57 N	6.93 W	504,524.97	726,514.37	1.46	11.22	59.26	
1,172.00	0.25	87.85	1,171.86	10.57 N	6.92 W	504,524.97	726,514.38	1.12	11.22	57.76	
1,174.00	0.26	90.90	1,173.86	10.57 N	6.91 W	504,524.97	726,514.39	0.79	11.22	61.73	
1,176.00	0.27	93.76	1,175.86	10.57 N	6.90 W	504,524.97	726,514.40	0.79	11.22	58.69	
1,178.00	0.28	96.44	1,177.86	10.57 N	6.89 W	504,524.97	726,514.41	0.79	11.21	55.83	
1,180.00	0.29	98.94	1,179.86	10.57 N	6.88 W	504,524.97	726,514.42	0.79	11.21	53.15	
1,182.00	0.30	101.28	1,181.86	10.57 N	6.87 W	504,524.97	726,514.43	0.79	11.21	50.64	
1,184.00	0.31	103.46	1,183.86	10.56 N	6.86 W	504,524.96	726,514.44	0.79	11.21	48.31	
1,186.00	0.32	105.49	1,185.86	10.56 N	6.85 W	504,524.96	726,514.45	0.79	11.20	46.13	
1,188.00	0.33	107.38	1,187.86	10.56 N	6.84 W	504,524.96	726,514.46	0.79	11.20	44.10	
1,190.00	0.34	109.14	1,189.86	10.56 N	6.83 W	504,524.96	726,514.47	0.79	11.19	42.21	
1,192.00	0.36	110.79	1,191.86	10.55 N	6.82 W	504,524.95	726,514.48	0.79	11.19	40.44	
1,194.00	0.37	112.32	1,193.86	10.55 N	6.81 W	504,524.95	726,514.49	0.79	11.18	38.80	
1,196.00	0.38	113.76	1,195.86	10.54 N	6.79 W	504,524.94	726,514.51	0.79	11.17	37.26	
1,198.00	0.39	115.10	1,197.86	10.54 N	6.78 W	504,524.94	726,514.52	0.79	11.17	35.83	
1,200.00	0.41	116.35	1,199.86	10.53 N	6.77 W	504,524.93	726,514.53	0.79	11.16	34.49	
1,202.00	0.42	117.53	1,201.86	10.52 N	6.76 W	504,524.92	726,514.54	0.79	11.15	33.23	
1,204.00	0.43	118.63	1,203.86	10.52 N	6.74 W	504,524.92	726,514.56	0.79	11.14	32.06	
1,206.00	0.45	119.67	1,205.86	10.51 N	6.73 W	504,524.91	726,514.57	0.79	11.14	30.95	
1,208.00	0.46	120.65	1,207.86	10.50 N	6.72 W	504,524.90	726,514.58	0.79	11.13	29.91	
1,210.00	0.48	121.57	1,209.86	10.49 N	6.70 W	504,524.89	726,514.60	0.79	11.12	28.94	
1,212.00	0.49	122.44	1,211.86	10.48 N	6.69 W	504,524.88	726,514.61	0.79	11.11	28.02	
1,214.00	0.50	123.25	1,213.86	10.47 N	6.67 W	504,524.87	726,514.63	0.79	11.10	27.15	
1,216.00	0.52	124.03	1,215.85	10.46 N	6.66 W	504,524.86	726,514.64	0.79	11.08	26.33	
1,218.00	0.53	124.76	1,217.85	10.45 N	6.64 W	504,524.85	726,514.66	0.79	11.07	25.56	
1,220.00	0.55	125.46	1,219.85	10.44 N	6.63 W	504,524.84	726,514.67	0.79	11.06	24.82	
1,222.00	0.56	126.12	1,221.85	10.43 N	6.61 W	504,524.83	726,514.69	0.79	11.05	24.13	
1,224.00	0.58	126.74	1,223.85	10.42 N	6.60 W	504,524.82	726,514.70	0.79	11.03	23.47	
1,226.00	0.59	127.34	1,225.85	10.41 N	6.58 W	504,524.81	726,514.72	0.79	11.02	22.85	
1,228.00	0.60	127.90	1,227.85	10.39 N	6.56 W	504,524.79	726,514.74	0.79	11.01	22.25	
1,230.00	0.62	128.44	1,229.85	10.38 N	6.55 W	504,524.78	726,514.75	0.79	10.99	21.69	
1,232.00	0.63	128.96	1,231.85	10.37 N	6.53 W	504,524.77	726,514.77	0.79	10.98	21.15	
1,234.00	0.65	129.45	1,233.85	10.35 N	6.51 W	504,524.75	726,514.79	0.79	10.96	20.63	
1,236.00	0.66	129.92	1,235.85	10.34 N	6.49 W	504,524.74	726,514.81	0.79	10.94	20.14	
1,238.00	0.68	130.36	1,237.85	10.32 N	6.48 W	504,524.72	726,514.82	0.79	10.93	19.67	
1,240.00	0.69	130.79	1,239.85	10.31 N	6.46 W	504,524.71	726,514.84	0.79	10.91	19.22	



Eddy County, NM (NAD83)

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Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
1,242.00	0.71	131.20	1,241.85	10.29 N	6.44 W	504,524.69	726,514.86	0.79	10.89	18.79	
1,244.00	0.72	131.60	1,243.85	10.28 N	6.42 W	504,524.68	726,514.88	0.79	10.87	18.38	
1,246.00	0.74	131.98	1,245.85	10.26 N	6.40 W	504,524.66	726,514.90	0.79	10.85	17.99	
1,248.00	0.75	132.34	1,247.85	10.24 N	6.38 W	504,524.64	726,514.92	0.79	10.83	17.61	
1,250.00	0.77	132.69	1,249.85	10.22 N	6.36 W	504,524.62	726,514.94	0.79	10.82	17.25	
1,252.00	0.78	133.02	1,251.85	10.20 N	6.34 W	504,524.60	726,514.96	0.79	10.79	16.90	
1,254.00	0.80	133.35	1,253.85	10.19 N	6.32 W	504,524.59	726,514.98	0.79	10.77	16.56	
1,256.00	0.81	133.66	1,255.85	10.17 N	6.30 W	504,524.57	726,515.00	0.79	10.75	16.24	
1,258.00	0.83	133.96	1,257.85	10.15 N	6.28 W	504,524.55	726,515.02	0.79	10.73	15.93	
1,260.00	0.84	134.24	1,259.85	10.13 N	6.26 W	504,524.53	726,515.04	0.79	10.71	15.63	
1,262.00	0.86	134.52	1,261.85	10.11 N	6.24 W	504,524.51	726,515.06	0.79	10.69	15.34	
1,264.00	0.87	134.79	1,263.85	10.08 N	6.22 W	504,524.48	726,515.08	0.79	10.66	15.07	
1,266.00	0.89	135.05	1,265.85	10.06 N	6.20 W	504,524.46	726,515.10	0.79	10.64	14.80	
1,268.00	0.89	135.05	1,267.85	10.04 N	6.17 W	504,524.44	726,515.13	0.00	10.61	10.98	
1,270.00	0.90	134.92	1,269.85	10.02 N	6.15 W	504,524.42	726,515.15	0.47	10.59	-12.23	
1,272.00	0.90	134.86	1,271.85	10.00 N	6.13 W	504,524.40	726,515.17	0.24	10.57	-12.10	
1,274.00	0.91	134.80	1,273.85	9.97 N	6.11 W	504,524.37	726,515.19	0.24	10.54	-12.04	
1,276.00	0.91	134.74	1,275.85	9.95 N	6.08 W	504,524.35	726,515.22	0.24	10.52	-11.97	
1,278.00	0.92	134.68	1,277.85	9.93 N	6.06 W	504,524.33	726,515.24	0.24	10.49	-11.91	
1,280.00	0.92	134.62	1,279.85	9.91 N	6.04 W	504,524.31	726,515.26	0.24	10.47	-11.85	
1,282.00	0.93	134.56	1,281.85	9.88 N	6.02 W	504,524.28	726,515.28	0.24	10.44	-11.79	
1,284.00	0.93	134.50	1,283.85	9.86 N	5.99 W	504,524.26	726,515.31	0.24	10.42	-11.73	
1,286.00	0.94	134.44	1,285.85	9.84 N	5.97 W	504,524.24	726,515.33	0.24	10.39	-11.67	
1,288.00	0.94	134.38	1,287.85	9.82 N	5.95 W	504,524.22	726,515.35	0.24	10.37	-11.61	
1,290.00	0.95	134.32	1,289.85	9.79 N	5.92 W	504,524.19	726,515.38	0.24	10.34	-11.56	
1,292.00	0.95	134.27	1,291.85	9.77 N	5.90 W	504,524.17	726,515.40	0.24	10.32	-11.50	
1,294.00	0.95	134.21	1,293.85	9.75 N	5.88 W	504,524.15	726,515.42	0.24	10.29	-11.44	
1,296.00	0.96	134.15	1,295.85	9.72 N	5.85 W	504,524.12	726,515.45	0.24	10.27	-11.39	
1,298.00	0.96	134.10	1,297.85	9.70 N	5.83 W	504,524.10	726,515.47	0.24	10.24	-11.33	
1,300.00	0.97	134.05	1,299.85	9.68 N	5.80 W	504,524.08	726,515.50	0.24	10.21	-11.28	
1,302.00	0.97	133.99	1,301.85	9.65 N	5.78 W	504,524.05	726,515.52	0.24	10.19	-11.22	
1,304.00	0.98	133.94	1,303.85	9.63 N	5.75 W	504,524.03	726,515.55	0.24	10.16	-11.17	
1,306.00	0.98	133.88	1,305.85	9.60 N	5.73 W	504,524.00	726,515.57	0.24	10.14	-11.11	
1,308.00	0.99	133.83	1,307.85	9.58 N	5.70 W	504,523.98	726,515.60	0.24	10.11	-11.06	
1,310.00	0.99	133.78	1,309.85	9.56 N	5.68 W	504,523.96	726,515.62	0.24	10.08	-11.01	
1,312.00	1.00	133.73	1,311.84	9.53 N	5.65 W	504,523.93	726,515.65	0.24	10.06	-10.96	
1,314.00	1.00	133.68	1,313.84	9.51 N	5.63 W	504,523.91	726,515.67	0.24	10.03	-10.90	



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Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
1,316.00	1.01	133.63	1,315.84	9.48 N	5.60 W	504,523.88	726,515.70	0.24	10.00	-10.85	
1,318.00	1.01	133.58	1,317.84	9.46 N	5.58 W	504,523.86	726,515.72	0.24	9.98	-10.80	
1,320.00	1.01	133.53	1,319.84	9.44 N	5.55 W	504,523.84	726,515.75	0.24	9.95	-10.75	
1,322.00	1.02	133.48	1,321.84	9.41 N	5.53 W	504,523.81	726,515.77	0.24	9.92	-10.70	
1,324.00	1.02	133.43	1,323.84	9.39 N	5.50 W	504,523.79	726,515.80	0.24	9.90	-10.65	
1,326.00	1.03	133.38	1,325.84	9.36 N	5.48 W	504,523.76	726,515.82	0.24	9.87	-10.60	
1,328.00	1.03	133.33	1,327.84	9.34 N	5.45 W	504,523.74	726,515.85	0.24	9.84	-10.56	
1,330.00	1.04	133.29	1,329.84	9.31 N	5.42 W	504,523.71	726,515.88	0.24	9.81	-10.51	
1,332.00	1.04	133.24	1,331.84	9.29 N	5.40 W	504,523.69	726,515.90	0.24	9.79	-10.46	
1,334.00	1.05	133.19	1,333.84	9.26 N	5.37 W	504,523.66	726,515.93	0.24	9.76	-10.41	
1,336.00	1.05	133.15	1,335.84	9.24 N	5.34 W	504,523.64	726,515.96	0.24	9.73	-10.37	
1,338.00	1.06	133.10	1,337.84	9.21 N	5.32 W	504,523.61	726,515.98	0.24	9.70	-10.32	
1,340.00	1.06	133.05	1,339.84	9.19 N	5.29 W	504,523.59	726,516.01	0.24	9.68	-10.27	
1,342.00	1.07	133.01	1,341.84	9.16 N	5.26 W	504,523.56	726,516.04	0.24	9.65	-10.23	
1,344.00	1.07	132.96	1,343.84	9.14 N	5.24 W	504,523.54	726,516.06	0.24	9.62	-10.18	
1,346.00	1.08	132.92	1,345.84	9.11 N	5.21 W	504,523.51	726,516.09	0.24	9.59	-10.14	
1,348.00	1.08	132.88	1,347.84	9.09 N	5.18 W	504,523.49	726,516.12	0.24	9.56	-10.10	
1,350.00	1.08	132.83	1,349.84	9.06 N	5.15 W	504,523.46	726,516.15	0.24	9.54	-10.05	
1,352.00	1.09	132.79	1,351.84	9.03 N	5.12 W	504,523.43	726,516.18	0.24	9.51	-10.01	
1,354.00	1.09	132.75	1,353.84	9.01 N	5.10 W	504,523.41	726,516.20	0.24	9.48	-9.97	
1,356.00	1.10	132.70	1,355.84	8.98 N	5.07 W	504,523.38	726,516.23	0.24	9.45	-9.92	
1,358.00	1.10	132.66	1,357.84	8.96 N	5.04 W	504,523.36	726,516.26	0.24	9.42	-9.88	
1,360.00	1.11	132.62	1,359.84	8.93 N	5.01 W	504,523.33	726,516.29	0.24	9.39	-9.84	
1,362.00	1.11	132.60	1,361.84	8.90 N	4.98 W	504,523.30	726,516.32	0.12	9.36	-9.80	
1,364.00	1.11	132.60	1,363.84	8.88 N	4.96 W	504,523.28	726,516.34	0.00	9.33	0.00	
1,366.00	1.10	132.69	1,365.84	8.85 N	4.93 W	504,523.25	726,516.37	0.41	9.31	167.76	
1,368.00	1.10	132.73	1,367.84	8.83 N	4.90 W	504,523.23	726,516.40	0.16	9.28	167.67	
1,370.00	1.10	132.76	1,369.83	8.80 N	4.87 W	504,523.20	726,516.43	0.16	9.25	167.63	
1,372.00	1.09	132.80	1,371.83	8.77 N	4.84 W	504,523.17	726,516.46	0.16	9.22	167.60	
1,374.00	1.09	132.84	1,373.83	8.75 N	4.81 W	504,523.15	726,516.49	0.16	9.19	167.56	
1,376.00	1.09	132.88	1,375.83	8.72 N	4.79 W	504,523.12	726,516.51	0.16	9.16	167.52	
1,378.00	1.08	132.91	1,377.83	8.70 N	4.76 W	504,523.10	726,516.54	0.16	9.13	167.48	
1,380.00	1.08	132.95	1,379.83	8.67 N	4.73 W	504,523.07	726,516.57	0.16	9.11	167.45	
1,382.00	1.08	132.99	1,381.83	8.65 N	4.70 W	504,523.05	726,516.60	0.16	9.08	167.41	
1,384.00	1.07	133.03	1,383.83	8.62 N	4.68 W	504,523.02	726,516.62	0.16	9.05	167.37	
1,386.00	1.07	133.07	1,385.83	8.59 N	4.65 W	504,522.99	726,516.65	0.16	9.02	167.33	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
1,388.00	1.07	133.10	1,387.83	8.57 N	4.62 W	504,522.97	726,516.68	0.16	8.99	167.29	
1,390.00	1.06	133.14	1,389.83	8.54 N	4.59 W	504,522.94	726,516.71	0.16	8.96	167.25	
1,392.00	1.06	133.18	1,391.83	8.52 N	4.57 W	504,522.92	726,516.73	0.16	8.94	167.22	
1,394.00	1.06	133.22	1,393.83	8.49 N	4.54 W	504,522.89	726,516.76	0.16	8.91	167.18	
1,396.00	1.05	133.26	1,395.83	8.47 N	4.51 W	504,522.87	726,516.79	0.16	8.88	167.14	
1,398.00	1.05	133.30	1,397.83	8.44 N	4.49 W	504,522.84	726,516.81	0.16	8.85	167.10	
1,400.00	1.05	133.34	1,399.83	8.42 N	4.46 W	504,522.82	726,516.84	0.16	8.83	167.06	
1,402.00	1.04	133.38	1,401.83	8.39 N	4.43 W	504,522.79	726,516.87	0.16	8.80	167.02	
1,404.00	1.04	133.42	1,403.83	8.37 N	4.41 W	504,522.77	726,516.89	0.16	8.77	166.98	
1,406.00	1.04	133.46	1,405.83	8.34 N	4.38 W	504,522.74	726,516.92	0.16	8.74	166.94	
1,408.00	1.03	133.50	1,407.83	8.32 N	4.35 W	504,522.72	726,516.95	0.16	8.72	166.90	
1,410.00	1.03	133.55	1,409.83	8.29 N	4.33 W	504,522.69	726,516.97	0.16	8.69	166.85	
1,412.00	1.03	133.59	1,411.83	8.27 N	4.30 W	504,522.67	726,517.00	0.16	8.66	166.81	
1,414.00	1.03	133.63	1,413.83	8.24 N	4.28 W	504,522.64	726,517.02	0.16	8.63	166.77	
1,416.00	1.02	133.67	1,415.83	8.22 N	4.25 W	504,522.62	726,517.05	0.16	8.61	166.73	
1,418.00	1.02	133.71	1,417.83	8.19 N	4.23 W	504,522.59	726,517.07	0.16	8.58	166.69	
1,420.00	1.02	133.76	1,419.83	8.17 N	4.20 W	504,522.57	726,517.10	0.16	8.55	166.64	
1,422.00	1.01	133.80	1,421.83	8.14 N	4.17 W	504,522.54	726,517.13	0.16	8.53	166.60	
1,424.00	1.01	133.84	1,423.83	8.12 N	4.15 W	504,522.52	726,517.15	0.16	8.50	166.56	
1,426.00	1.01	133.89	1,425.83	8.10 N	4.12 W	504,522.50	726,517.18	0.16	8.47	166.52	
1,428.00	1.00	133.93	1,427.83	8.07 N	4.10 W	504,522.47	726,517.20	0.16	8.44	166.47	
1,430.00	1.00	133.97	1,429.82	8.05 N	4.07 W	504,522.45	726,517.23	0.16	8.42	166.43	
1,432.00	1.00	134.02	1,431.82	8.02 N	4.05 W	504,522.42	726,517.25	0.16	8.39	166.38	
1,434.00	0.99	134.06	1,433.82	8.00 N	4.02 W	504,522.40	726,517.28	0.16	8.37	166.34	
1,436.00	0.99	134.11	1,435.82	7.97 N	4.00 W	504,522.37	726,517.30	0.16	8.34	166.30	
1,438.00	0.99	134.15	1,437.82	7.95 N	3.97 W	504,522.35	726,517.33	0.16	8.31	166.25	
1,440.00	0.98	134.20	1,439.82	7.93 N	3.95 W	504,522.33	726,517.35	0.16	8.29	166.21	
1,442.00	0.98	134.24	1,441.82	7.90 N	3.92 W	504,522.30	726,517.38	0.16	8.26	166.16	
1,444.00	0.98	134.29	1,443.82	7.88 N	3.90 W	504,522.28	726,517.40	0.16	8.23	166.11	
1,446.00	0.97	134.34	1,445.82	7.86 N	3.87 W	504,522.26	726,517.43	0.16	8.21	166.07	
1,448.00	0.97	134.38	1,447.82	7.83 N	3.85 W	504,522.23	726,517.45	0.16	8.18	166.02	
1,450.00	0.97	134.43	1,449.82	7.81 N	3.83 W	504,522.21	726,517.47	0.16	8.16	165.97	
1,452.00	0.96	134.48	1,451.82	7.78 N	3.80 W	504,522.18	726,517.50	0.16	8.13	165.93	
1,454.00	0.96	134.53	1,453.82	7.76 N	3.78 W	504,522.16	726,517.52	0.16	8.10	165.88	
1,456.00	0.96	134.55	1,455.82	7.74 N	3.75 W	504,522.14	726,517.55	0.08	8.08	165.83	
1,458.00	0.97	134.03	1,457.82	7.71 N	3.73 W	504,522.11	726,517.57	0.55	8.05	-51.61	
1,460.00	0.97	133.69	1,459.82	7.69 N	3.71 W	504,522.09	726,517.59	0.37	8.03	-51.10	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
1,462.00	0.98	133.36	1,461.82	7.67 N	3.68 W	504,522.07	726,517.62	0.37	8.00	-50.76	
1,464.00	0.98	133.03	1,463.82	7.64 N	3.66 W	504,522.04	726,517.64	0.37	7.97	-50.42	
1,466.00	0.99	132.70	1,465.82	7.62 N	3.63 W	504,522.02	726,517.67	0.37	7.95	-50.09	
1,468.00	0.99	132.37	1,467.82	7.60 N	3.61 W	504,522.00	726,517.69	0.37	7.92	-49.76	
1,470.00	1.00	132.05	1,469.82	7.57 N	3.58 W	504,521.97	726,517.72	0.37	7.90	-49.43	
1,472.00	1.00	131.73	1,471.82	7.55 N	3.55 W	504,521.95	726,517.75	0.37	7.87	-49.11	
1,474.00	1.01	131.41	1,473.82	7.53 N	3.53 W	504,521.93	726,517.77	0.37	7.85	-48.79	
1,476.00	1.01	131.09	1,475.82	7.50 N	3.50 W	504,521.90	726,517.80	0.37	7.82	-48.47	
1,478.00	1.02	130.78	1,477.82	7.48 N	3.47 W	504,521.88	726,517.83	0.37	7.79	-48.16	
1,480.00	1.02	130.47	1,479.82	7.46 N	3.45 W	504,521.86	726,517.85	0.37	7.77	-47.85	
1,482.00	1.03	130.17	1,481.82	7.43 N	3.42 W	504,521.83	726,517.88	0.37	7.74	-47.54	
1,484.00	1.03	129.87	1,483.82	7.41 N	3.39 W	504,521.81	726,517.91	0.37	7.72	-47.23	
1,486.00	1.04	129.57	1,485.82	7.39 N	3.37 W	504,521.79	726,517.93	0.37	7.69	-46.93	
1,488.00	1.04	129.27	1,487.82	7.37 N	3.34 W	504,521.77	726,517.96	0.37	7.67	-46.63	
1,490.00	1.05	128.98	1,489.82	7.34 N	3.31 W	504,521.74	726,517.99	0.37	7.64	-46.34	
1,492.00	1.05	128.69	1,491.82	7.32 N	3.28 W	504,521.72	726,518.02	0.37	7.61	-46.04	
1,494.00	1.06	128.40	1,493.82	7.30 N	3.25 W	504,521.70	726,518.05	0.37	7.59	-45.75	
1,496.00	1.06	128.12	1,495.81	7.27 N	3.22 W	504,521.67	726,518.08	0.37	7.56	-45.46	
1,498.00	1.07	127.83	1,497.81	7.25 N	3.19 W	504,521.65	726,518.11	0.37	7.54	-45.18	
1,500.00	1.07	127.55	1,499.81	7.23 N	3.16 W	504,521.63	726,518.14	0.37	7.51	-44.90	
1,502.00	1.08	127.28	1,501.81	7.21 N	3.13 W	504,521.61	726,518.17	0.37	7.49	-44.62	
1,504.00	1.08	127.00	1,503.81	7.18 N	3.10 W	504,521.58	726,518.20	0.37	7.46	-44.34	
1,506.00	1.09	126.73	1,505.81	7.16 N	3.07 W	504,521.56	726,518.23	0.37	7.43	-44.07	
1,508.00	1.09	126.46	1,507.81	7.14 N	3.04 W	504,521.54	726,518.26	0.37	7.41	-43.80	
1,510.00	1.10	126.20	1,509.81	7.11 N	3.01 W	504,521.51	726,518.29	0.37	7.38	-43.53	
1,512.00	1.10	125.93	1,511.81	7.09 N	2.98 W	504,521.49	726,518.32	0.37	7.36	-43.26	
1,514.00	1.11	125.67	1,513.81	7.07 N	2.95 W	504,521.47	726,518.35	0.37	7.33	-43.00	
1,516.00	1.11	125.42	1,515.81	7.05 N	2.92 W	504,521.45	726,518.38	0.37	7.31	-42.74	
1,518.00	1.12	125.16	1,517.81	7.02 N	2.89 W	504,521.42	726,518.41	0.37	7.28	-42.48	
1,520.00	1.13	124.91	1,519.81	7.00 N	2.85 W	504,521.40	726,518.45	0.37	7.25	-42.22	
1,522.00	1.13	124.66	1,521.81	6.98 N	2.82 W	504,521.38	726,518.48	0.37	7.23	-41.97	
1,524.00	1.14	124.41	1,523.81	6.96 N	2.79 W	504,521.36	726,518.51	0.37	7.20	-41.72	
1,526.00	1.14	124.16	1,525.81	6.93 N	2.76 W	504,521.33	726,518.54	0.37	7.18	-41.47	
1,528.00	1.15	123.92	1,527.81	6.91 N	2.72 W	504,521.31	726,518.58	0.37	7.15	-41.23	
1,530.00	1.15	123.68	1,529.81	6.89 N	2.69 W	504,521.29	726,518.61	0.37	7.13	-40.98	
1,532.00	1.16	123.44	1,531.81	6.87 N	2.66 W	504,521.27	726,518.64	0.37	7.10	-40.74	
1,534.00	1.16	123.20	1,533.81	6.85 N	2.62 W	504,521.25	726,518.68	0.37	7.08	-40.50	



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Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
1,536.00	1.17	122.97	1,535.81	6.82 N	2.59 W	504,521.22	726,518.71	0.37	7.05	-40.27	
1,538.00	1.18	122.74	1,537.81	6.80 N	2.55 W	504,521.20	726,518.75	0.37	7.02	-40.03	
1,540.00	1.18	122.51	1,539.81	6.78 N	2.52 W	504,521.18	726,518.78	0.37	7.00	-39.80	
1,542.00	1.19	122.28	1,541.81	6.76 N	2.49 W	504,521.16	726,518.81	0.37	6.97	-39.57	
1,544.00	1.19	122.05	1,543.81	6.73 N	2.45 W	504,521.13	726,518.85	0.37	6.95	-39.34	
1,546.00	1.20	121.83	1,545.81	6.71 N	2.41 W	504,521.11	726,518.89	0.37	6.92	-39.12	
1,548.00	1.20	121.61	1,547.80	6.69 N	2.38 W	504,521.09	726,518.92	0.37	6.90	-38.89	
1,550.00	1.21	121.39	1,549.80	6.67 N	2.34 W	504,521.07	726,518.96	0.37	6.87	-38.67	
1,552.00	1.19	121.65	1,551.80	6.65 N	2.31 W	504,521.05	726,518.99	0.95	6.85	163.73	
1,554.00	1.17	121.91	1,553.80	6.62 N	2.27 W	504,521.02	726,519.03	0.95	6.82	163.48	
1,556.00	1.16	122.18	1,555.80	6.60 N	2.24 W	504,521.00	726,519.06	0.95	6.80	163.21	
1,558.00	1.14	122.46	1,557.80	6.58 N	2.20 W	504,520.98	726,519.10	0.95	6.77	162.94	
1,560.00	1.12	122.75	1,559.80	6.56 N	2.17 W	504,520.96	726,519.13	0.95	6.75	162.66	
1,562.00	1.10	123.05	1,561.80	6.54 N	2.14 W	504,520.94	726,519.16	0.95	6.72	162.37	
1,564.00	1.08	123.36	1,563.80	6.52 N	2.11 W	504,520.92	726,519.19	0.95	6.70	162.07	
1,566.00	1.06	123.68	1,565.80	6.50 N	2.08 W	504,520.90	726,519.22	0.95	6.67	161.76	
1,568.00	1.05	124.01	1,567.80	6.48 N	2.04 W	504,520.88	726,519.26	0.95	6.65	161.44	
1,570.00	1.03	124.36	1,569.80	6.46 N	2.01 W	504,520.86	726,519.29	0.95	6.63	161.11	
1,572.00	1.01	124.71	1,571.80	6.44 N	1.99 W	504,520.84	726,519.31	0.95	6.60	160.77	
1,574.00	0.99	125.08	1,573.80	6.42 N	1.96 W	504,520.82	726,519.34	0.95	6.58	160.41	
1,576.00	0.98	125.46	1,575.80	6.40 N	1.93 W	504,520.80	726,519.37	0.95	6.56	160.04	
1,578.00	0.96	125.86	1,577.80	6.38 N	1.90 W	504,520.78	726,519.40	0.95	6.54	159.66	
1,580.00	0.94	126.27	1,579.80	6.36 N	1.87 W	504,520.76	726,519.43	0.95	6.51	159.27	
1,582.00	0.92	126.69	1,581.80	6.34 N	1.85 W	504,520.74	726,519.45	0.95	6.49	158.86	
1,584.00	0.90	127.14	1,583.80	6.32 N	1.82 W	504,520.72	726,519.48	0.95	6.47	158.43	
1,586.00	0.89	127.60	1,585.80	6.30 N	1.80 W	504,520.70	726,519.50	0.95	6.45	157.99	
1,588.00	0.87	128.08	1,587.80	6.28 N	1.77 W	504,520.68	726,519.53	0.95	6.43	157.53	
1,590.00	0.85	128.58	1,589.80	6.26 N	1.75 W	504,520.66	726,519.55	0.95	6.41	157.05	
1,592.00	0.83	129.09	1,591.80	6.24 N	1.73 W	504,520.64	726,519.57	0.95	6.39	156.55	
1,594.00	0.82	129.64	1,593.80	6.23 N	1.70 W	504,520.63	726,519.60	0.95	6.37	156.03	
1,596.00	0.80	130.20	1,595.80	6.21 N	1.68 W	504,520.61	726,519.62	0.95	6.35	155.49	
1,598.00	0.78	130.79	1,597.80	6.19 N	1.66 W	504,520.59	726,519.64	0.95	6.33	154.92	
1,600.00	0.77	131.41	1,599.80	6.17 N	1.64 W	504,520.57	726,519.66	0.95	6.31	154.33	
1,602.00	0.75	132.05	1,601.80	6.15 N	1.62 W	504,520.55	726,519.68	0.95	6.29	153.72	
1,604.00	0.73	132.73	1,603.80	6.14 N	1.60 W	504,520.54	726,519.70	0.95	6.27	153.07	
1,606.00	0.71	133.43	1,605.80	6.12 N	1.58 W	504,520.52	726,519.72	0.95	6.25	152.40	

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Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
1,608.00	0.70	134.17	1,607.80	6.10 N	1.57 W	504,520.50	726,519.73	0.95	6.23	151.69	
1,610.00	0.68	134.95	1,609.80	6.09 N	1.55 W	504,520.49	726,519.75	0.95	6.21	150.95	
1,612.00	0.66	135.77	1,611.80	6.07 N	1.53 W	504,520.47	726,519.77	0.95	6.19	150.17	
1,614.00	0.65	136.62	1,613.80	6.05 N	1.52 W	504,520.45	726,519.78	0.95	6.18	149.36	
1,616.00	0.63	137.52	1,615.80	6.04 N	1.50 W	504,520.44	726,519.80	0.95	6.16	148.50	
1,618.00	0.62	138.47	1,617.80	6.02 N	1.49 W	504,520.42	726,519.81	0.95	6.14	147.60	
1,620.00	0.60	139.47	1,619.80	6.00 N	1.47 W	504,520.40	726,519.83	0.95	6.12	146.66	
1,622.00	0.59	140.52	1,621.80	5.99 N	1.46 W	504,520.39	726,519.84	0.95	6.11	145.66	
1,624.00	0.57	141.62	1,623.80	5.97 N	1.45 W	504,520.37	726,519.85	0.95	6.09	144.61	
1,626.00	0.55	142.79	1,625.80	5.96 N	1.44 W	504,520.36	726,519.86	0.95	6.07	143.50	
1,628.00	0.54	144.02	1,627.79	5.94 N	1.42 W	504,520.34	726,519.88	0.95	6.06	142.34	
1,630.00	0.53	145.33	1,629.79	5.93 N	1.41 W	504,520.33	726,519.89	0.95	6.04	141.10	
1,632.00	0.51	146.71	1,631.79	5.91 N	1.40 W	504,520.31	726,519.90	0.95	6.02	139.80	
1,634.00	0.50	148.16	1,633.79	5.90 N	1.39 W	504,520.30	726,519.91	0.95	6.01	138.42	
1,636.00	0.48	149.70	1,635.79	5.88 N	1.39 W	504,520.28	726,519.91	0.95	5.99	136.97	
1,638.00	0.47	151.33	1,637.79	5.87 N	1.38 W	504,520.27	726,519.92	0.95	5.98	135.43	
1,640.00	0.46	153.05	1,639.79	5.85 N	1.37 W	504,520.25	726,519.93	0.95	5.96	133.80	
1,642.00	0.44	154.87	1,641.79	5.84 N	1.36 W	504,520.24	726,519.94	0.95	5.95	132.07	
1,644.00	0.43	156.80	1,643.79	5.83 N	1.36 W	504,520.23	726,519.94	0.95	5.93	130.25	
1,646.00	0.42	158.83	1,645.79	5.81 N	1.35 W	504,520.21	726,519.95	0.95	5.92	128.33	
1,648.00	0.41	160.98	1,647.79	5.80 N	1.35 W	504,520.20	726,519.95	0.95	5.90	126.29	
1,650.00	0.40	163.24	1,649.79	5.78 N	1.34 W	504,520.18	726,519.96	0.95	5.89	124.15	
1,652.00	0.39	165.61	1,651.79	5.77 N	1.34 W	504,520.17	726,519.96	0.95	5.88	121.89	
1,654.00	0.38	168.10	1,653.79	5.76 N	1.33 W	504,520.16	726,519.97	0.95	5.86	119.52	
1,656.00	0.37	170.71	1,655.79	5.75 N	1.33 W	504,520.15	726,519.97	0.95	5.85	117.02	
1,658.00	0.36	173.43	1,657.79	5.73 N	1.33 W	504,520.13	726,519.97	0.95	5.84	114.41	
1,660.00	0.36	176.26	1,659.79	5.72 N	1.33 W	504,520.12	726,519.97	0.95	5.83	111.69	
1,662.00	0.35	179.19	1,661.79	5.71 N	1.33 W	504,520.11	726,519.97	0.95	5.81	108.87	
1,664.00	0.35	182.20	1,663.79	5.70 N	1.33 W	504,520.10	726,519.97	0.95	5.80	105.94	
1,666.00	0.34	185.29	1,665.79	5.68 N	1.33 W	504,520.08	726,519.97	0.95	5.79	102.92	
1,668.00	0.34	188.44	1,667.79	5.67 N	1.33 W	504,520.07	726,519.97	0.95	5.78	99.84	
1,670.00	0.34	191.63	1,669.79	5.66 N	1.33 W	504,520.06	726,519.97	0.95	5.77	96.69	
1,672.00	0.34	194.84	1,671.79	5.65 N	1.34 W	504,520.05	726,519.96	0.95	5.75	93.50	
1,674.00	0.34	198.05	1,673.79	5.64 N	1.34 W	504,520.04	726,519.96	0.95	5.74	90.29	
1,676.00	0.34	201.24	1,675.79	5.63 N	1.34 W	504,520.03	726,519.96	0.95	5.73	87.08	
1,678.00	0.34	204.40	1,677.79	5.61 N	1.35 W	504,520.01	726,519.95	0.95	5.72	83.88	
1,680.00	0.35	207.50	1,679.79	5.60 N	1.35 W	504,520.00	726,519.95	0.95	5.71	80.73	



Eddy County, NM (NAD83)

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Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
1,682.00	0.35	210.53	1,681.79	5.59 N	1.36 W	504,519.99	726,519.94	0.95	5.70	77.63	
1,684.00	0.36	213.47	1,683.79	5.58 N	1.37 W	504,519.98	726,519.93	0.95	5.69	74.60	
1,686.00	0.36	216.32	1,685.79	5.57 N	1.37 W	504,519.97	726,519.93	0.95	5.68	71.66	
1,688.00	0.37	219.06	1,687.79	5.56 N	1.38 W	504,519.96	726,519.92	0.95	5.67	68.81	
1,690.00	0.38	221.69	1,689.79	5.55 N	1.39 W	504,519.95	726,519.91	0.95	5.66	66.07	
1,692.00	0.39	224.20	1,691.79	5.54 N	1.40 W	504,519.94	726,519.90	0.95	5.66	63.44	
1,694.00	0.40	226.60	1,693.79	5.53 N	1.41 W	504,519.93	726,519.89	0.95	5.65	60.93	
1,696.00	0.41	228.88	1,695.79	5.52 N	1.42 W	504,519.92	726,519.88	0.95	5.64	58.53	
1,698.00	0.42	231.04	1,697.79	5.51 N	1.43 W	504,519.91	726,519.87	0.95	5.63	56.25	
1,700.00	0.43	233.10	1,699.79	5.51 N	1.44 W	504,519.91	726,519.86	0.95	5.62	54.08	
1,702.00	0.44	235.04	1,701.79	5.50 N	1.45 W	504,519.90	726,519.85	0.95	5.62	52.03	
1,704.00	0.45	236.88	1,703.79	5.49 N	1.47 W	504,519.89	726,519.83	0.95	5.61	50.09	
1,706.00	0.47	238.62	1,705.79	5.48 N	1.48 W	504,519.88	726,519.82	0.95	5.60	48.25	
1,708.00	0.48	240.27	1,707.79	5.47 N	1.49 W	504,519.87	726,519.81	0.95	5.59	46.51	
1,710.00	0.49	241.82	1,709.79	5.46 N	1.51 W	504,519.86	726,519.79	0.95	5.59	44.86	
1,712.00	0.51	243.29	1,711.79	5.45 N	1.52 W	504,519.85	726,519.78	0.95	5.58	43.31	
1,714.00	0.52	244.68	1,713.79	5.45 N	1.54 W	504,519.85	726,519.76	0.95	5.57	41.84	
1,716.00	0.54	246.00	1,715.79	5.44 N	1.56 W	504,519.84	726,519.74	0.95	5.57	40.44	
1,718.00	0.55	247.25	1,717.79	5.43 N	1.57 W	504,519.83	726,519.73	0.95	5.56	39.13	
1,720.00	0.57	248.43	1,719.79	5.42 N	1.59 W	504,519.82	726,519.71	0.95	5.56	37.88	
1,722.00	0.58	249.54	1,721.79	5.42 N	1.61 W	504,519.82	726,519.69	0.95	5.55	36.70	
1,724.00	0.60	250.60	1,723.79	5.41 N	1.63 W	504,519.81	726,519.67	0.95	5.55	35.58	
1,726.00	0.61	251.61	1,725.79	5.40 N	1.65 W	504,519.80	726,519.65	0.95	5.54	34.52	
1,728.00	0.63	252.57	1,727.79	5.40 N	1.67 W	504,519.80	726,519.63	0.95	5.54	33.52	
1,730.00	0.65	253.47	1,729.79	5.39 N	1.69 W	504,519.79	726,519.61	0.95	5.53	32.56	
1,732.00	0.66	254.34	1,731.79	5.38 N	1.71 W	504,519.78	726,519.59	0.95	5.53	31.65	
1,734.00	0.68	255.16	1,733.79	5.38 N	1.74 W	504,519.78	726,519.56	0.95	5.53	30.79	
1,736.00	0.69	255.94	1,735.79	5.37 N	1.76 W	504,519.77	726,519.54	0.95	5.52	29.97	
1,738.00	0.71	256.69	1,737.79	5.37 N	1.78 W	504,519.77	726,519.52	0.95	5.52	29.19	
1,740.00	0.72	257.05	1,739.79	5.36 N	1.81 W	504,519.76	726,519.49	0.48	5.52	28.44	
1,742.00	0.72	257.05	1,741.79	5.35 N	1.83 W	504,519.75	726,519.47	0.00	5.51	0.00	
1,744.00	0.72	257.05	1,743.79	5.35 N	1.86 W	504,519.75	726,519.44	0.00	5.51	0.00	
1,746.00	0.72	257.43	1,745.79	5.34 N	1.88 W	504,519.74	726,519.42	0.27	5.51	119.54	
1,748.00	0.72	257.53	1,747.79	5.34 N	1.91 W	504,519.74	726,519.39	0.08	5.50	119.17	
1,750.00	0.72	257.64	1,749.79	5.33 N	1.93 W	504,519.73	726,519.37	0.08	5.50	119.06	
1,752.00	0.72	257.75	1,751.79	5.33 N	1.96 W	504,519.73	726,519.34	0.08	5.50	118.95	
1,754.00	0.71	257.86	1,753.79	5.32 N	1.98 W	504,519.72	726,519.32	0.08	5.49	118.84	



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Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
1,756.00	0.71	257.97	1,755.79	5.32 N	2.00 W	504,519.72	726,519.30	0.08	5.49	118.73	
1,758.00	0.71	258.08	1,757.79	5.31 N	2.03 W	504,519.71	726,519.27	0.08	5.49	118.62	
1,760.00	0.71	258.19	1,759.79	5.31 N	2.05 W	504,519.71	726,519.25	0.08	5.49	118.51	
1,762.00	0.71	258.30	1,761.79	5.30 N	2.08 W	504,519.70	726,519.22	0.08	5.48	118.40	
1,764.00	0.71	258.41	1,763.79	5.30 N	2.10 W	504,519.70	726,519.20	0.08	5.48	118.29	
1,766.00	0.71	258.52	1,765.79	5.29 N	2.13 W	504,519.69	726,519.17	0.08	5.48	118.18	
1,768.00	0.71	258.63	1,767.79	5.29 N	2.15 W	504,519.69	726,519.15	0.08	5.48	118.07	
1,770.00	0.71	258.74	1,769.79	5.28 N	2.17 W	504,519.68	726,519.13	0.08	5.47	117.96	
1,772.00	0.71	258.85	1,771.79	5.28 N	2.20 W	504,519.68	726,519.10	0.08	5.47	117.85	
1,774.00	0.71	258.96	1,773.79	5.27 N	2.22 W	504,519.67	726,519.08	0.08	5.47	117.74	
1,776.00	0.71	259.07	1,775.79	5.27 N	2.25 W	504,519.67	726,519.05	0.08	5.47	117.63	
1,778.00	0.71	259.18	1,777.79	5.26 N	2.27 W	504,519.66	726,519.03	0.08	5.47	117.52	
1,780.00	0.70	259.30	1,779.79	5.26 N	2.30 W	504,519.66	726,519.00	0.08	5.46	117.41	
1,782.00	0.70	259.41	1,781.79	5.25 N	2.32 W	504,519.65	726,518.98	0.08	5.46	117.30	
1,784.00	0.70	259.52	1,783.79	5.25 N	2.34 W	504,519.65	726,518.96	0.08	5.46	117.19	
1,786.00	0.70	259.63	1,785.79	5.24 N	2.37 W	504,519.64	726,518.93	0.08	5.46	117.07	
1,788.00	0.70	259.74	1,787.79	5.24 N	2.39 W	504,519.64	726,518.91	0.08	5.46	116.96	
1,790.00	0.70	259.86	1,789.79	5.24 N	2.42 W	504,519.64	726,518.88	0.08	5.45	116.85	
1,792.00	0.70	259.97	1,791.79	5.23 N	2.44 W	504,519.63	726,518.86	0.08	5.45	116.74	
1,794.00	0.70	260.08	1,793.79	5.23 N	2.46 W	504,519.63	726,518.84	0.08	5.45	116.62	
1,796.00	0.70	260.20	1,795.79	5.22 N	2.49 W	504,519.62	726,518.81	0.08	5.45	116.51	
1,798.00	0.70	260.31	1,797.79	5.22 N	2.51 W	504,519.62	726,518.79	0.08	5.45	116.40	
1,800.00	0.70	260.42	1,799.79	5.21 N	2.54 W	504,519.61	726,518.76	0.08	5.44	116.28	
1,802.00	0.70	260.54	1,801.79	5.21 N	2.56 W	504,519.61	726,518.74	0.08	5.44	116.17	
1,804.00	0.70	260.65	1,803.79	5.21 N	2.58 W	504,519.61	726,518.72	0.08	5.44	116.05	
1,806.00	0.70	260.77	1,805.79	5.20 N	2.61 W	504,519.60	726,518.69	0.08	5.44	115.94	
1,808.00	0.70	260.88	1,807.79	5.20 N	2.63 W	504,519.60	726,518.67	0.08	5.44	115.82	
1,810.00	0.69	261.00	1,809.79	5.20 N	2.66 W	504,519.60	726,518.64	0.08	5.44	115.71	
1,812.00	0.69	261.11	1,811.79	5.19 N	2.68 W	504,519.59	726,518.62	0.08	5.44	115.59	
1,814.00	0.69	261.23	1,813.79	5.19 N	2.70 W	504,519.59	726,518.60	0.08	5.43	115.48	
1,816.00	0.69	261.34	1,815.79	5.18 N	2.73 W	504,519.58	726,518.57	0.08	5.43	115.36	
1,818.00	0.69	261.46	1,817.79	5.18 N	2.75 W	504,519.58	726,518.55	0.08	5.43	115.25	
1,820.00	0.69	261.58	1,819.79	5.18 N	2.78 W	504,519.58	726,518.52	0.08	5.43	115.13	
1,822.00	0.69	261.69	1,821.78	5.17 N	2.80 W	504,519.57	726,518.50	0.08	5.43	115.02	
1,824.00	0.69	261.81	1,823.78	5.17 N	2.82 W	504,519.57	726,518.48	0.08	5.43	114.90	
1,826.00	0.69	261.93	1,825.78	5.17 N	2.85 W	504,519.57	726,518.45	0.08	5.43	114.78	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
1,828.00	0.69	262.04	1,827.78	5.16 N	2.87 W	504,519.56	726,518.43	0.08	5.43	114.67	
1,830.00	0.69	262.16	1,829.78	5.16 N	2.90 W	504,519.56	726,518.40	0.08	5.43	114.55	
1,832.00	0.69	262.28	1,831.78	5.16 N	2.92 W	504,519.56	726,518.38	0.08	5.43	114.43	
1,834.00	0.69	262.40	1,833.78	5.15 N	2.94 W	504,519.55	726,518.36	0.08	5.42	114.31	
1,836.00	0.69	262.51	1,835.78	5.15 N	2.97 W	504,519.55	726,518.33	0.08	5.42	114.20	
1,838.00	0.69	262.63	1,837.78	5.15 N	2.99 W	504,519.55	726,518.31	0.08	5.42	114.08	
1,840.00	0.68	262.75	1,839.78	5.14 N	3.01 W	504,519.54	726,518.29	0.08	5.42	113.96	
1,842.00	0.68	262.87	1,841.78	5.14 N	3.04 W	504,519.54	726,518.26	0.08	5.42	113.84	
1,844.00	0.68	262.99	1,843.78	5.14 N	3.06 W	504,519.54	726,518.24	0.08	5.42	113.72	
1,846.00	0.68	263.11	1,845.78	5.14 N	3.09 W	504,519.54	726,518.21	0.08	5.42	113.60	
1,848.00	0.68	263.23	1,847.78	5.13 N	3.11 W	504,519.53	726,518.19	0.08	5.42	113.49	
1,850.00	0.68	263.35	1,849.78	5.13 N	3.13 W	504,519.53	726,518.17	0.08	5.42	113.37	
1,852.00	0.68	263.47	1,851.78	5.13 N	3.16 W	504,519.53	726,518.14	0.08	5.42	113.25	
1,854.00	0.68	263.59	1,853.78	5.12 N	3.18 W	504,519.52	726,518.12	0.08	5.42	113.13	
1,856.00	0.68	263.71	1,855.78	5.12 N	3.20 W	504,519.52	726,518.10	0.08	5.42	113.01	
1,858.00	0.68	263.83	1,857.78	5.12 N	3.23 W	504,519.52	726,518.07	0.08	5.42	112.89	
1,860.00	0.68	263.95	1,859.78	5.12 N	3.25 W	504,519.52	726,518.05	0.08	5.42	112.77	
1,862.00	0.68	264.07	1,861.78	5.11 N	3.27 W	504,519.51	726,518.03	0.08	5.42	112.65	
1,864.00	0.68	264.19	1,863.78	5.11 N	3.30 W	504,519.51	726,518.00	0.08	5.42	112.53	
1,866.00	0.68	264.31	1,865.78	5.11 N	3.32 W	504,519.51	726,517.98	0.08	5.42	112.40	
1,868.00	0.68	264.43	1,867.78	5.11 N	3.34 W	504,519.51	726,517.96	0.08	5.42	112.28	
1,870.00	0.68	264.55	1,869.78	5.10 N	3.37 W	504,519.50	726,517.93	0.08	5.42	112.16	
1,872.00	0.68	264.67	1,871.78	5.10 N	3.39 W	504,519.50	726,517.91	0.08	5.42	112.04	
1,874.00	0.67	264.80	1,873.78	5.10 N	3.41 W	504,519.50	726,517.89	0.08	5.42	111.92	
1,876.00	0.67	264.92	1,875.78	5.10 N	3.44 W	504,519.50	726,517.86	0.08	5.42	111.80	
1,878.00	0.67	265.04	1,877.78	5.10 N	3.46 W	504,519.50	726,517.84	0.08	5.42	111.67	
1,880.00	0.67	265.16	1,879.78	5.09 N	3.49 W	504,519.49	726,517.81	0.08	5.42	111.55	
1,882.00	0.67	265.29	1,881.78	5.09 N	3.51 W	504,519.49	726,517.79	0.08	5.42	111.43	
1,884.00	0.67	265.41	1,883.78	5.09 N	3.53 W	504,519.49	726,517.77	0.08	5.42	111.31	
1,886.00	0.67	265.53	1,885.78	5.09 N	3.56 W	504,519.49	726,517.74	0.08	5.42	111.18	
1,888.00	0.67	265.66	1,887.78	5.09 N	3.58 W	504,519.49	726,517.72	0.08	5.42	111.06	
1,890.00	0.67	265.78	1,889.78	5.08 N	3.60 W	504,519.48	726,517.70	0.08	5.42	110.94	
1,892.00	0.67	265.90	1,891.78	5.08 N	3.63 W	504,519.48	726,517.67	0.08	5.42	110.81	
1,894.00	0.67	266.03	1,893.78	5.08 N	3.65 W	504,519.48	726,517.65	0.08	5.42	110.69	
1,896.00	0.67	266.15	1,895.78	5.08 N	3.67 W	504,519.48	726,517.63	0.08	5.43	110.57	
1,898.00	0.67	266.28	1,897.78	5.08 N	3.70 W	504,519.48	726,517.60	0.08	5.43	110.44	
1,900.00	0.67	266.40	1,899.78	5.08 N	3.72 W	504,519.48	726,517.58	0.08	5.43	110.32	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
1,902.00	0.67	266.53	1,901.78	5.08 N	3.74 W	504,519.48	726,517.56	0.08	5.43	110.19	
1,904.00	0.67	266.65	1,903.78	5.07 N	3.76 W	504,519.47	726,517.54	0.08	5.43	110.07	
1,906.00	0.67	266.78	1,905.78	5.07 N	3.79 W	504,519.47	726,517.51	0.08	5.43	109.94	
1,908.00	0.67	266.90	1,907.78	5.07 N	3.81 W	504,519.47	726,517.49	0.08	5.43	109.82	
1,910.00	0.66	267.03	1,909.78	5.07 N	3.83 W	504,519.47	726,517.47	0.08	5.43	109.69	
1,912.00	0.66	267.15	1,911.78	5.07 N	3.86 W	504,519.47	726,517.44	0.08	5.43	109.57	
1,914.00	0.66	267.28	1,913.78	5.07 N	3.88 W	504,519.47	726,517.42	0.08	5.43	109.44	
1,916.00	0.66	267.40	1,915.78	5.07 N	3.90 W	504,519.47	726,517.40	0.08	5.44	109.31	
1,918.00	0.66	267.53	1,917.78	5.07 N	3.93 W	504,519.47	726,517.37	0.08	5.44	109.19	
1,920.00	0.66	267.66	1,919.78	5.06 N	3.95 W	504,519.46	726,517.35	0.08	5.44	109.06	
1,922.00	0.66	267.78	1,921.78	5.06 N	3.97 W	504,519.46	726,517.33	0.08	5.44	108.93	
1,924.00	0.66	267.91	1,923.78	5.06 N	4.00 W	504,519.46	726,517.30	0.08	5.44	108.81	
1,926.00	0.66	268.04	1,925.78	5.06 N	4.02 W	504,519.46	726,517.28	0.08	5.44	108.68	
1,928.00	0.66	268.17	1,927.78	5.06 N	4.04 W	504,519.46	726,517.26	0.08	5.44	108.55	
1,930.00	0.66	268.23	1,929.78	5.06 N	4.07 W	504,519.46	726,517.23	0.04	5.45	108.43	
1,932.00	0.66	268.23	1,931.78	5.06 N	4.09 W	504,519.46	726,517.21	0.00	5.45	0.00	
1,934.00	0.66	268.79	1,933.78	5.06 N	4.11 W	504,519.46	726,517.19	0.33	5.45	95.37	
1,936.00	0.66	269.02	1,935.78	5.06 N	4.13 W	504,519.46	726,517.17	0.13	5.45	94.81	
1,938.00	0.66	269.24	1,937.78	5.06 N	4.16 W	504,519.46	726,517.14	0.13	5.45	94.59	
1,940.00	0.66	269.47	1,939.78	5.06 N	4.18 W	504,519.46	726,517.12	0.13	5.46	94.36	
1,942.00	0.66	269.70	1,941.78	5.06 N	4.20 W	504,519.46	726,517.10	0.13	5.46	94.13	
1,944.00	0.66	269.92	1,943.78	5.06 N	4.23 W	504,519.46	726,517.07	0.13	5.46	93.91	
1,946.00	0.66	270.15	1,945.78	5.06 N	4.25 W	504,519.46	726,517.05	0.13	5.46	93.68	
1,948.00	0.66	270.37	1,947.78	5.06 N	4.27 W	504,519.46	726,517.03	0.13	5.47	93.46	
1,950.00	0.66	270.60	1,949.78	5.06 N	4.30 W	504,519.46	726,517.00	0.13	5.47	93.23	
1,952.00	0.66	270.83	1,951.78	5.06 N	4.32 W	504,519.46	726,516.98	0.13	5.47	93.00	
1,954.00	0.66	271.05	1,953.78	5.06 N	4.34 W	504,519.46	726,516.96	0.13	5.47	92.78	
1,956.00	0.66	271.28	1,955.78	5.06 N	4.36 W	504,519.46	726,516.94	0.13	5.48	92.55	
1,958.00	0.66	271.51	1,957.78	5.06 N	4.39 W	504,519.46	726,516.91	0.13	5.48	92.33	
1,960.00	0.66	271.73	1,959.78	5.06 N	4.41 W	504,519.46	726,516.89	0.13	5.48	92.10	
1,962.00	0.66	271.96	1,961.78	5.06 N	4.43 W	504,519.46	726,516.87	0.13	5.48	91.87	
1,964.00	0.66	272.19	1,963.78	5.06 N	4.46 W	504,519.46	726,516.84	0.13	5.49	91.65	
1,966.00	0.66	272.41	1,965.78	5.06 N	4.48 W	504,519.46	726,516.82	0.13	5.49	91.42	
1,968.00	0.66	272.64	1,967.77	5.06 N	4.50 W	504,519.46	726,516.80	0.13	5.49	91.19	
1,970.00	0.66	272.87	1,969.77	5.07 N	4.52 W	504,519.47	726,516.78	0.13	5.50	90.96	
1,972.00	0.66	273.09	1,971.77	5.07 N	4.55 W	504,519.47	726,516.75	0.13	5.50	90.74	
1,974.00	0.66	273.32	1,973.77	5.07 N	4.57 W	504,519.47	726,516.73	0.13	5.50	90.51	



Eddy County, NM (NAD83)

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Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
1,976.00	0.66	273.55	1,975.77	5.07 N	4.59 W	504,519.47	726,516.71	0.13	5.51	90.28	
1,978.00	0.66	273.78	1,977.77	5.07 N	4.62 W	504,519.47	726,516.68	0.13	5.51	90.06	
1,980.00	0.66	274.00	1,979.77	5.07 N	4.64 W	504,519.47	726,516.66	0.13	5.52	89.83	
1,982.00	0.66	274.23	1,981.77	5.07 N	4.66 W	504,519.47	726,516.64	0.13	5.52	89.60	
1,984.00	0.66	274.46	1,983.77	5.08 N	4.69 W	504,519.48	726,516.61	0.13	5.52	89.38	
1,986.00	0.66	274.68	1,985.77	5.08 N	4.71 W	504,519.48	726,516.59	0.13	5.53	89.15	
1,988.00	0.66	274.91	1,987.77	5.08 N	4.73 W	504,519.48	726,516.57	0.13	5.53	88.92	
1,990.00	0.66	275.14	1,989.77	5.08 N	4.75 W	504,519.48	726,516.55	0.13	5.54	88.70	
1,992.00	0.66	275.36	1,991.77	5.08 N	4.78 W	504,519.48	726,516.52	0.13	5.54	88.47	
1,994.00	0.66	275.59	1,993.77	5.09 N	4.80 W	504,519.49	726,516.50	0.13	5.55	88.24	
1,996.00	0.66	275.82	1,995.77	5.09 N	4.82 W	504,519.49	726,516.48	0.13	5.55	88.01	
1,998.00	0.66	276.04	1,997.77	5.09 N	4.84 W	504,519.49	726,516.46	0.13	5.55	87.79	
2,000.00	0.66	276.27	1,999.77	5.09 N	4.87 W	504,519.49	726,516.43	0.13	5.56	87.56	
2,002.00	0.66	276.50	2,001.77	5.10 N	4.89 W	504,519.50	726,516.41	0.13	5.56	87.34	
2,004.00	0.66	276.72	2,003.77	5.10 N	4.91 W	504,519.50	726,516.39	0.13	5.57	87.11	
2,006.00	0.66	276.95	2,005.77	5.10 N	4.94 W	504,519.50	726,516.36	0.13	5.57	86.88	
2,008.00	0.66	277.18	2,007.77	5.10 N	4.96 W	504,519.50	726,516.34	0.13	5.58	86.66	
2,010.00	0.66	277.40	2,009.77	5.11 N	4.98 W	504,519.51	726,516.32	0.13	5.58	86.43	
2,012.00	0.66	277.63	2,011.77	5.11 N	5.00 W	504,519.51	726,516.30	0.13	5.59	86.20	
2,014.00	0.66	277.85	2,013.77	5.11 N	5.03 W	504,519.51	726,516.27	0.13	5.60	85.98	
2,016.00	0.66	278.08	2,015.77	5.12 N	5.05 W	504,519.52	726,516.25	0.13	5.60	85.75	
2,018.00	0.66	278.30	2,017.77	5.12 N	5.07 W	504,519.52	726,516.23	0.13	5.61	85.53	
2,020.00	0.66	278.53	2,019.77	5.12 N	5.10 W	504,519.52	726,516.20	0.13	5.61	85.30	
2,022.00	0.66	278.75	2,021.77	5.13 N	5.12 W	504,519.53	726,516.18	0.13	5.62	85.08	
2,024.00	0.66	278.98	2,023.77	5.13 N	5.14 W	504,519.53	726,516.16	0.13	5.62	84.85	
2,026.00	0.67	278.55	2,025.77	5.13 N	5.16 W	504,519.53	726,516.14	0.40	5.63	-38.38	
2,028.00	0.67	278.13	2,027.77	5.14 N	5.19 W	504,519.54	726,516.11	0.40	5.64	-37.95	
2,030.00	0.68	277.71	2,029.77	5.14 N	5.21 W	504,519.54	726,516.09	0.40	5.64	-37.53	
2,032.00	0.69	277.30	2,031.77	5.14 N	5.23 W	504,519.54	726,516.07	0.40	5.65	-37.11	
2,034.00	0.69	276.90	2,033.77	5.15 N	5.26 W	504,519.55	726,516.04	0.40	5.65	-36.70	
2,036.00	0.70	276.51	2,035.77	5.15 N	5.28 W	504,519.55	726,516.02	0.40	5.66	-36.30	
2,038.00	0.71	276.13	2,037.77	5.15 N	5.31 W	504,519.55	726,515.99	0.40	5.66	-35.91	
2,040.00	0.71	275.75	2,039.77	5.15 N	5.33 W	504,519.55	726,515.97	0.40	5.67	-35.53	
2,042.00	0.72	275.38	2,041.77	5.16 N	5.36 W	504,519.56	726,515.94	0.40	5.67	-35.15	
2,044.00	0.73	275.01	2,043.77	5.16 N	5.38 W	504,519.56	726,515.92	0.40	5.68	-34.78	
2,046.00	0.73	274.65	2,045.77	5.16 N	5.41 W	504,519.56	726,515.89	0.40	5.68	-34.41	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

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				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
2,048.00	0.74	274.30	2,047.77	5.16 N	5.43 W	504,519.56	726,515.87	0.40	5.69	-34.06	
2,050.00	0.75	273.96	2,049.77	5.16 N	5.46 W	504,519.56	726,515.84	0.40	5.69	-33.70	
2,052.00	0.75	273.62	2,051.77	5.17 N	5.48 W	504,519.57	726,515.82	0.40	5.70	-33.36	
2,054.00	0.76	273.29	2,053.77	5.17 N	5.51 W	504,519.57	726,515.79	0.40	5.70	-33.02	
2,056.00	0.77	272.96	2,055.77	5.17 N	5.54 W	504,519.57	726,515.76	0.40	5.70	-32.69	
2,058.00	0.77	272.64	2,057.77	5.17 N	5.56 W	504,519.57	726,515.74	0.40	5.71	-32.36	
2,060.00	0.78	272.32	2,059.77	5.17 N	5.59 W	504,519.57	726,515.71	0.40	5.71	-32.04	
2,062.00	0.79	272.02	2,061.77	5.17 N	5.62 W	504,519.57	726,515.68	0.40	5.72	-31.73	
2,064.00	0.79	271.71	2,063.77	5.17 N	5.65 W	504,519.57	726,515.65	0.40	5.72	-31.42	
2,066.00	0.80	271.41	2,065.77	5.17 N	5.67 W	504,519.57	726,515.63	0.40	5.72	-31.11	
2,068.00	0.81	271.12	2,067.77	5.18 N	5.70 W	504,519.58	726,515.60	0.40	5.73	-30.81	
2,070.00	0.81	270.83	2,069.77	5.18 N	5.73 W	504,519.58	726,515.57	0.40	5.73	-30.52	
2,072.00	0.82	270.54	2,071.77	5.18 N	5.76 W	504,519.58	726,515.54	0.40	5.73	-30.23	
2,074.00	0.83	270.27	2,073.77	5.18 N	5.79 W	504,519.58	726,515.51	0.40	5.74	-29.95	
2,076.00	0.83	269.99	2,075.77	5.18 N	5.82 W	504,519.58	726,515.48	0.40	5.74	-29.67	
2,078.00	0.84	269.72	2,077.77	5.18 N	5.85 W	504,519.58	726,515.45	0.40	5.74	-29.39	
2,080.00	0.85	269.46	2,079.77	5.18 N	5.87 W	504,519.58	726,515.43	0.40	5.74	-29.12	
2,082.00	0.86	269.19	2,081.77	5.18 N	5.90 W	504,519.58	726,515.40	0.40	5.75	-28.86	
2,084.00	0.86	268.94	2,083.77	5.18 N	5.93 W	504,519.58	726,515.37	0.40	5.75	-28.60	
2,086.00	0.87	268.69	2,085.77	5.17 N	5.96 W	504,519.57	726,515.34	0.40	5.75	-28.34	
2,088.00	0.88	268.44	2,087.77	5.17 N	6.00 W	504,519.57	726,515.30	0.40	5.75	-28.09	
2,090.00	0.88	268.19	2,089.77	5.17 N	6.03 W	504,519.57	726,515.27	0.40	5.76	-27.84	
2,092.00	0.89	267.95	2,091.77	5.17 N	6.06 W	504,519.57	726,515.24	0.40	5.76	-27.59	
2,094.00	0.90	267.72	2,093.76	5.17 N	6.09 W	504,519.57	726,515.21	0.40	5.76	-27.35	
2,096.00	0.91	267.48	2,095.76	5.17 N	6.12 W	504,519.57	726,515.18	0.40	5.76	-27.12	
2,098.00	0.91	267.25	2,097.76	5.17 N	6.15 W	504,519.57	726,515.15	0.40	5.76	-26.88	
2,100.00	0.92	267.03	2,099.76	5.17 N	6.18 W	504,519.57	726,515.12	0.40	5.77	-26.66	
2,102.00	0.93	266.81	2,101.76	5.16 N	6.22 W	504,519.56	726,515.08	0.40	5.77	-26.43	
2,104.00	0.94	266.59	2,103.76	5.16 N	6.25 W	504,519.56	726,515.05	0.40	5.77	-26.21	
2,106.00	0.94	266.37	2,105.76	5.16 N	6.28 W	504,519.56	726,515.02	0.40	5.77	-25.99	
2,108.00	0.95	266.16	2,107.76	5.16 N	6.31 W	504,519.56	726,514.99	0.40	5.77	-25.77	
2,110.00	0.96	265.95	2,109.76	5.16 N	6.35 W	504,519.56	726,514.95	0.40	5.77	-25.56	
2,112.00	0.96	265.75	2,111.76	5.15 N	6.38 W	504,519.55	726,514.92	0.40	5.77	-25.35	
2,114.00	0.97	265.54	2,113.76	5.15 N	6.41 W	504,519.55	726,514.89	0.40	5.77	-25.15	
2,116.00	0.98	265.34	2,115.76	5.15 N	6.45 W	504,519.55	726,514.85	0.40	5.78	-24.95	
2,118.00	0.99	265.15	2,117.76	5.15 N	6.48 W	504,519.55	726,514.82	0.40	5.78	-24.75	
2,120.00	0.99	265.05	2,119.76	5.14 N	6.52 W	504,519.54	726,514.78	0.20	5.78	-24.55	

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				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
2,122.00	0.99	265.05	2,121.76	5.14 N	6.55 W	504,519.54	726,514.75	0.00	5.78	0.00	
2,124.00	0.99	265.05	2,123.76	5.14 N	6.59 W	504,519.54	726,514.71	0.00	5.78	0.00	
2,126.00	0.99	264.72	2,125.76	5.13 N	6.62 W	504,519.53	726,514.68	0.30	5.78	-70.57	
2,128.00	0.99	264.63	2,127.76	5.13 N	6.65 W	504,519.53	726,514.65	0.09	5.78	-70.24	
2,130.00	0.99	264.54	2,129.76	5.13 N	6.69 W	504,519.53	726,514.61	0.09	5.78	-70.15	
2,132.00	0.99	264.44	2,131.76	5.12 N	6.72 W	504,519.52	726,514.58	0.09	5.78	-70.06	
2,134.00	0.99	264.35	2,133.76	5.12 N	6.76 W	504,519.52	726,514.54	0.09	5.78	-69.96	
2,136.00	0.99	264.26	2,135.76	5.12 N	6.79 W	504,519.52	726,514.51	0.09	5.78	-69.87	
2,138.00	1.00	264.17	2,137.76	5.11 N	6.83 W	504,519.51	726,514.47	0.09	5.78	-69.78	
2,140.00	1.00	264.07	2,139.76	5.11 N	6.86 W	504,519.51	726,514.44	0.09	5.78	-69.68	
2,142.00	1.00	263.98	2,141.76	5.11 N	6.90 W	504,519.51	726,514.40	0.09	5.78	-69.59	
2,144.00	1.00	263.89	2,143.76	5.10 N	6.93 W	504,519.50	726,514.37	0.09	5.78	-69.50	
2,146.00	1.00	263.80	2,145.76	5.10 N	6.97 W	504,519.50	726,514.33	0.09	5.78	-69.41	
2,148.00	1.00	263.70	2,147.76	5.09 N	7.00 W	504,519.49	726,514.30	0.09	5.78	-69.32	
2,150.00	1.00	263.61	2,149.76	5.09 N	7.03 W	504,519.49	726,514.27	0.09	5.78	-69.22	
2,152.00	1.00	263.52	2,151.76	5.09 N	7.07 W	504,519.49	726,514.23	0.09	5.78	-69.13	
2,154.00	1.00	263.43	2,153.76	5.08 N	7.10 W	504,519.48	726,514.20	0.09	5.78	-69.04	
2,156.00	1.00	263.34	2,155.76	5.08 N	7.14 W	504,519.48	726,514.16	0.09	5.78	-68.95	
2,158.00	1.00	263.25	2,157.76	5.08 N	7.17 W	504,519.48	726,514.13	0.09	5.78	-68.86	
2,160.00	1.00	263.15	2,159.76	5.07 N	7.21 W	504,519.47	726,514.09	0.09	5.77	-68.76	
2,162.00	1.00	263.06	2,161.75	5.07 N	7.24 W	504,519.47	726,514.06	0.09	5.77	-68.67	
2,164.00	1.00	262.97	2,163.75	5.06 N	7.28 W	504,519.46	726,514.02	0.09	5.77	-68.58	
2,166.00	1.00	262.88	2,165.75	5.06 N	7.31 W	504,519.46	726,513.99	0.09	5.77	-68.49	
2,168.00	1.00	262.79	2,167.75	5.05 N	7.35 W	504,519.45	726,513.95	0.09	5.77	-68.40	
2,170.00	1.01	262.70	2,169.75	5.05 N	7.38 W	504,519.45	726,513.92	0.09	5.77	-68.31	
2,172.00	1.01	262.61	2,171.75	5.04 N	7.42 W	504,519.44	726,513.88	0.09	5.77	-68.22	
2,174.00	1.01	262.52	2,173.75	5.04 N	7.45 W	504,519.44	726,513.85	0.09	5.77	-68.13	
2,176.00	1.01	262.43	2,175.75	5.04 N	7.49 W	504,519.44	726,513.81	0.09	5.77	-68.04	
2,178.00	1.01	262.34	2,177.75	5.03 N	7.52 W	504,519.43	726,513.78	0.09	5.77	-67.95	
2,180.00	1.01	262.25	2,179.75	5.03 N	7.56 W	504,519.43	726,513.74	0.09	5.77	-67.86	
2,182.00	1.01	262.16	2,181.75	5.02 N	7.59 W	504,519.42	726,513.71	0.09	5.76	-67.77	
2,184.00	1.01	262.07	2,183.75	5.02 N	7.63 W	504,519.42	726,513.67	0.09	5.76	-67.68	
2,186.00	1.01	261.98	2,185.75	5.01 N	7.66 W	504,519.41	726,513.64	0.09	5.76	-67.59	
2,188.00	1.01	261.89	2,187.75	5.01 N	7.70 W	504,519.41	726,513.60	0.09	5.76	-67.50	
2,190.00	1.01	261.80	2,189.75	5.00 N	7.73 W	504,519.40	726,513.57	0.09	5.76	-67.41	
2,192.00	1.01	261.71	2,191.75	5.00 N	7.77 W	504,519.40	726,513.53	0.09	5.76	-67.32	
2,194.00	1.01	261.62	2,193.75	4.99 N	7.80 W	504,519.39	726,513.50	0.09	5.76	-67.23	



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				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
2,196.00	1.01	261.53	2,195.75	4.99 N	7.84 W	504,519.39	726,513.46	0.09	5.75	-67.14	
2,198.00	1.01	261.44	2,197.75	4.98 N	7.87 W	504,519.38	726,513.43	0.09	5.75	-67.05	
2,200.00	1.02	261.35	2,199.75	4.98 N	7.91 W	504,519.38	726,513.39	0.09	5.75	-66.96	
2,202.00	1.02	261.26	2,201.75	4.97 N	7.94 W	504,519.37	726,513.36	0.09	5.75	-66.87	
2,204.00	1.02	261.17	2,203.75	4.97 N	7.98 W	504,519.37	726,513.32	0.09	5.75	-66.78	
2,206.00	1.02	261.08	2,205.75	4.96 N	8.01 W	504,519.36	726,513.29	0.09	5.75	-66.69	
2,208.00	1.02	261.00	2,207.75	4.95 N	8.05 W	504,519.35	726,513.25	0.09	5.74	-66.60	
2,210.00	1.02	260.91	2,209.75	4.95 N	8.08 W	504,519.35	726,513.22	0.09	5.74	-66.51	
2,212.00	1.02	260.82	2,211.75	4.94 N	8.12 W	504,519.34	726,513.18	0.09	5.74	-66.43	
2,214.00	1.02	260.73	2,213.75	4.94 N	8.15 W	504,519.34	726,513.15	0.09	5.74	-66.34	
2,216.00	1.01	260.93	2,215.75	4.93 N	8.19 W	504,519.33	726,513.11	0.35	5.74	149.55	
2,218.00	1.01	261.14	2,217.75	4.93 N	8.22 W	504,519.33	726,513.08	0.35	5.73	149.35	
2,220.00	1.00	261.34	2,219.75	4.92 N	8.26 W	504,519.32	726,513.04	0.35	5.73	149.14	
2,222.00	1.00	261.55	2,221.75	4.92 N	8.29 W	504,519.32	726,513.01	0.35	5.73	148.93	
2,224.00	0.99	261.77	2,223.75	4.91 N	8.32 W	504,519.31	726,512.98	0.35	5.73	148.72	
2,226.00	0.98	261.98	2,225.74	4.91 N	8.36 W	504,519.31	726,512.94	0.35	5.73	148.51	
2,228.00	0.98	262.20	2,227.74	4.90 N	8.39 W	504,519.30	726,512.91	0.35	5.73	148.30	
2,230.00	0.97	262.42	2,229.74	4.90 N	8.43 W	504,519.30	726,512.87	0.35	5.72	148.08	
2,232.00	0.97	262.64	2,231.74	4.89 N	8.46 W	504,519.29	726,512.84	0.35	5.72	147.86	
2,234.00	0.96	262.87	2,233.74	4.89 N	8.49 W	504,519.29	726,512.81	0.35	5.72	147.63	
2,236.00	0.95	263.10	2,235.74	4.88 N	8.53 W	504,519.28	726,512.77	0.35	5.72	147.41	
2,238.00	0.95	263.33	2,237.74	4.88 N	8.56 W	504,519.28	726,512.74	0.35	5.72	147.18	
2,240.00	0.94	263.57	2,239.74	4.88 N	8.59 W	504,519.28	726,512.71	0.35	5.72	146.95	
2,242.00	0.94	263.80	2,241.74	4.87 N	8.62 W	504,519.27	726,512.68	0.35	5.72	146.71	
2,244.00	0.93	264.04	2,243.74	4.87 N	8.66 W	504,519.27	726,512.64	0.35	5.72	146.48	
2,246.00	0.92	264.29	2,245.74	4.87 N	8.69 W	504,519.27	726,512.61	0.35	5.72	146.24	
2,248.00	0.92	264.53	2,247.74	4.86 N	8.72 W	504,519.26	726,512.58	0.35	5.72	145.99	
2,250.00	0.91	264.78	2,249.74	4.86 N	8.75 W	504,519.26	726,512.55	0.35	5.72	145.75	
2,252.00	0.91	265.04	2,251.74	4.86 N	8.78 W	504,519.26	726,512.52	0.35	5.72	145.50	
2,254.00	0.90	265.29	2,253.74	4.85 N	8.82 W	504,519.25	726,512.48	0.35	5.72	145.24	
2,256.00	0.90	265.55	2,255.74	4.85 N	8.85 W	504,519.25	726,512.45	0.35	5.72	144.99	
2,258.00	0.89	265.82	2,257.74	4.85 N	8.88 W	504,519.25	726,512.42	0.35	5.72	144.73	
2,260.00	0.88	266.08	2,259.74	4.85 N	8.91 W	504,519.25	726,512.39	0.35	5.72	144.46	
2,262.00	0.88	266.35	2,261.74	4.84 N	8.94 W	504,519.24	726,512.36	0.35	5.73	144.20	
2,264.00	0.87	266.63	2,263.74	4.84 N	8.97 W	504,519.24	726,512.33	0.35	5.73	143.93	
2,266.00	0.87	266.90	2,265.74	4.84 N	9.00 W	504,519.24	726,512.30	0.35	5.73	143.65	



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				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
2,268.00	0.86	267.18	2,267.74	4.84 N	9.03 W	504,519.24	726,512.27	0.35	5.73	143.38	
2,270.00	0.86	267.47	2,269.74	4.84 N	9.06 W	504,519.24	726,512.24	0.35	5.73	143.10	
2,272.00	0.85	267.76	2,271.74	4.84 N	9.09 W	504,519.24	726,512.21	0.35	5.73	142.81	
2,274.00	0.84	268.05	2,273.74	4.84 N	9.12 W	504,519.24	726,512.18	0.35	5.73	142.52	
2,276.00	0.84	268.35	2,275.74	4.84 N	9.15 W	504,519.24	726,512.15	0.35	5.74	142.23	
2,278.00	0.83	268.65	2,277.74	4.83 N	9.18 W	504,519.23	726,512.12	0.35	5.74	141.93	
2,280.00	0.83	268.95	2,279.74	4.83 N	9.21 W	504,519.23	726,512.09	0.35	5.74	141.63	
2,282.00	0.82	269.26	2,281.74	4.83 N	9.24 W	504,519.23	726,512.06	0.35	5.74	141.33	
2,284.00	0.82	269.57	2,283.74	4.83 N	9.27 W	504,519.23	726,512.03	0.35	5.75	141.02	
2,286.00	0.81	269.89	2,285.74	4.83 N	9.29 W	504,519.23	726,512.01	0.35	5.75	140.71	
2,288.00	0.81	270.21	2,287.74	4.83 N	9.32 W	504,519.23	726,511.98	0.35	5.75	140.39	
2,290.00	0.80	270.53	2,289.74	4.83 N	9.35 W	504,519.23	726,511.95	0.35	5.76	140.07	
2,292.00	0.79	270.86	2,291.74	4.83 N	9.38 W	504,519.23	726,511.92	0.35	5.76	139.75	
2,294.00	0.79	271.20	2,293.74	4.83 N	9.41 W	504,519.23	726,511.89	0.35	5.76	139.42	
2,296.00	0.78	271.53	2,295.74	4.83 N	9.43 W	504,519.23	726,511.87	0.35	5.76	139.08	
2,298.00	0.78	271.88	2,297.74	4.84 N	9.46 W	504,519.24	726,511.84	0.35	5.77	138.75	
2,300.00	0.77	272.22	2,299.74	4.84 N	9.49 W	504,519.24	726,511.81	0.35	5.77	138.40	
2,302.00	0.77	272.58	2,301.74	4.84 N	9.51 W	504,519.24	726,511.79	0.35	5.78	138.06	
2,304.00	0.76	272.93	2,303.74	4.84 N	9.54 W	504,519.24	726,511.76	0.35	5.78	137.70	
2,306.00	0.76	273.30	2,305.74	4.84 N	9.57 W	504,519.24	726,511.73	0.35	5.78	137.35	
2,308.00	0.75	273.66	2,307.74	4.84 N	9.59 W	504,519.24	726,511.71	0.35	5.79	136.98	
2,310.00	0.75	273.85	2,309.74	4.84 N	9.62 W	504,519.24	726,511.68	0.18	5.79	136.62	
2,312.00	0.75	273.85	2,311.74	4.85 N	9.65 W	504,519.25	726,511.65	0.00	5.80	0.00	
2,314.00	0.75	273.85	2,313.74	4.85 N	9.67 W	504,519.25	726,511.63	0.00	5.80	0.00	
2,316.00	0.75	273.85	2,315.73	4.85 N	9.70 W	504,519.25	726,511.60	0.00	5.81	0.00	
2,318.00	0.75	273.85	2,317.73	4.85 N	9.72 W	504,519.25	726,511.58	0.00	5.81	0.00	
2,320.00	0.75	273.69	2,319.73	4.85 N	9.75 W	504,519.25	726,511.55	0.26	5.81	-155.76	
2,322.00	0.74	273.66	2,321.73	4.85 N	9.78 W	504,519.25	726,511.52	0.05	5.82	-155.60	
2,324.00	0.74	273.63	2,323.73	4.86 N	9.80 W	504,519.26	726,511.50	0.05	5.82	-155.57	
2,326.00	0.74	273.60	2,325.73	4.86 N	9.83 W	504,519.26	726,511.47	0.05	5.83	-155.54	
2,328.00	0.74	273.57	2,327.73	4.86 N	9.85 W	504,519.26	726,511.45	0.05	5.83	-155.51	
2,330.00	0.74	273.54	2,329.73	4.86 N	9.88 W	504,519.26	726,511.42	0.05	5.84	-155.48	
2,332.00	0.74	273.51	2,331.73	4.86 N	9.90 W	504,519.26	726,511.40	0.05	5.84	-155.45	
2,334.00	0.74	273.48	2,333.73	4.86 N	9.93 W	504,519.26	726,511.37	0.05	5.84	-155.42	
2,336.00	0.74	273.45	2,335.73	4.87 N	9.96 W	504,519.27	726,511.34	0.05	5.85	-155.39	
2,338.00	0.74	273.42	2,337.73	4.87 N	9.98 W	504,519.27	726,511.32	0.05	5.85	-155.36	
2,340.00	0.74	273.38	2,339.73	4.87 N	10.01 W	504,519.27	726,511.29	0.05	5.86	-155.33	



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				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
2,342.00	0.74	273.35	2,341.73	4.87 N	10.03 W	504,519.27	726,511.27	0.05	5.86	-155.30	
2,344.00	0.74	273.32	2,343.73	4.87 N	10.06 W	504,519.27	726,511.24	0.05	5.86	-155.27	
2,346.00	0.73	273.29	2,345.73	4.87 N	10.08 W	504,519.27	726,511.22	0.05	5.87	-155.23	
2,348.00	0.73	273.26	2,347.73	4.87 N	10.11 W	504,519.27	726,511.19	0.05	5.87	-155.20	
2,350.00	0.73	273.23	2,349.73	4.88 N	10.14 W	504,519.28	726,511.16	0.05	5.88	-155.17	
2,352.00	0.73	273.20	2,351.73	4.88 N	10.16 W	504,519.28	726,511.14	0.05	5.88	-155.14	
2,354.00	0.73	273.17	2,353.73	4.88 N	10.19 W	504,519.28	726,511.11	0.05	5.88	-155.11	
2,356.00	0.73	273.14	2,355.73	4.88 N	10.21 W	504,519.28	726,511.09	0.05	5.89	-155.08	
2,358.00	0.73	273.11	2,357.73	4.88 N	10.24 W	504,519.28	726,511.06	0.05	5.89	-155.05	
2,360.00	0.73	273.08	2,359.73	4.88 N	10.26 W	504,519.28	726,511.04	0.05	5.90	-155.02	
2,362.00	0.73	273.04	2,361.73	4.88 N	10.29 W	504,519.28	726,511.01	0.05	5.90	-154.99	
2,364.00	0.73	273.01	2,363.73	4.89 N	10.31 W	504,519.29	726,510.99	0.05	5.90	-154.96	
2,366.00	0.73	272.98	2,365.73	4.89 N	10.34 W	504,519.29	726,510.96	0.05	5.91	-154.92	
2,368.00	0.72	272.95	2,367.73	4.89 N	10.36 W	504,519.29	726,510.94	0.05	5.91	-154.89	
2,370.00	0.72	272.92	2,369.73	4.89 N	10.39 W	504,519.29	726,510.91	0.05	5.92	-154.86	
2,372.00	0.72	272.89	2,371.73	4.89 N	10.41 W	504,519.29	726,510.89	0.05	5.92	-154.83	
2,374.00	0.72	272.86	2,373.73	4.89 N	10.44 W	504,519.29	726,510.86	0.05	5.92	-154.80	
2,376.00	0.72	272.82	2,375.73	4.89 N	10.47 W	504,519.29	726,510.83	0.05	5.93	-154.77	
2,378.00	0.72	272.79	2,377.73	4.89 N	10.49 W	504,519.29	726,510.81	0.05	5.93	-154.73	
2,380.00	0.72	272.76	2,379.73	4.90 N	10.52 W	504,519.30	726,510.78	0.05	5.94	-154.70	
2,382.00	0.72	272.73	2,381.73	4.90 N	10.54 W	504,519.30	726,510.76	0.05	5.94	-154.67	
2,384.00	0.72	272.70	2,383.73	4.90 N	10.57 W	504,519.30	726,510.73	0.05	5.94	-154.64	
2,386.00	0.72	272.66	2,385.73	4.90 N	10.59 W	504,519.30	726,510.71	0.05	5.95	-154.61	
2,388.00	0.72	272.63	2,387.73	4.90 N	10.62 W	504,519.30	726,510.68	0.05	5.95	-154.57	
2,390.00	0.72	272.60	2,389.73	4.90 N	10.64 W	504,519.30	726,510.66	0.05	5.95	-154.54	
2,392.00	0.71	272.57	2,391.73	4.90 N	10.67 W	504,519.30	726,510.63	0.05	5.96	-154.51	
2,394.00	0.71	272.53	2,393.73	4.90 N	10.69 W	504,519.30	726,510.61	0.05	5.96	-154.48	
2,396.00	0.71	272.50	2,395.73	4.90 N	10.72 W	504,519.30	726,510.58	0.05	5.96	-154.44	
2,398.00	0.71	272.47	2,397.73	4.91 N	10.74 W	504,519.31	726,510.56	0.05	5.97	-154.41	
2,400.00	0.71	272.44	2,399.73	4.91 N	10.76 W	504,519.31	726,510.54	0.05	5.97	-154.38	
2,402.00	0.71	272.40	2,401.73	4.91 N	10.79 W	504,519.31	726,510.51	0.05	5.98	-154.35	
2,404.00	0.71	272.37	2,403.73	4.91 N	10.81 W	504,519.31	726,510.49	0.05	5.98	-154.31	
2,406.00	0.71	272.34	2,405.73	4.91 N	10.84 W	504,519.31	726,510.46	0.05	5.98	-154.28	
2,408.00	0.71	272.30	2,407.73	4.91 N	10.86 W	504,519.31	726,510.44	0.05	5.99	-154.25	
2,410.00	0.71	272.27	2,409.73	4.91 N	10.89 W	504,519.31	726,510.41	0.05	5.99	-154.22	
2,412.00	0.71	272.24	2,411.73	4.91 N	10.91 W	504,519.31	726,510.39	0.05	5.99	-154.18	
2,414.00	0.71	272.20	2,413.73	4.91 N	10.94 W	504,519.31	726,510.36	0.05	6.00	-154.15	

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Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
2,416.00	0.70	272.17	2,415.73	4.91 N	10.96 W	504,519.31	726,510.34	0.05	6.00	-154.12	
2,418.00	0.70	272.14	2,417.73	4.92 N	10.99 W	504,519.32	726,510.31	0.05	6.00	-154.08	
2,420.00	0.70	272.10	2,419.73	4.92 N	11.01 W	504,519.32	726,510.29	0.05	6.01	-154.05	
2,422.00	0.70	272.07	2,421.73	4.92 N	11.04 W	504,519.32	726,510.26	0.05	6.01	-154.02	
2,424.00	0.70	272.04	2,423.73	4.92 N	11.06 W	504,519.32	726,510.24	0.05	6.01	-153.98	
2,426.00	0.70	272.00	2,425.73	4.92 N	11.08 W	504,519.32	726,510.22	0.05	6.02	-153.95	
2,428.00	0.70	271.97	2,427.73	4.92 N	11.11 W	504,519.32	726,510.19	0.05	6.02	-153.91	
2,430.00	0.70	271.93	2,429.73	4.92 N	11.13 W	504,519.32	726,510.17	0.05	6.02	-153.88	
2,432.00	0.70	271.90	2,431.73	4.92 N	11.16 W	504,519.32	726,510.14	0.05	6.03	-153.85	
2,434.00	0.70	271.87	2,433.73	4.92 N	11.18 W	504,519.32	726,510.12	0.05	6.03	-153.81	
2,436.00	0.70	271.83	2,435.73	4.92 N	11.21 W	504,519.32	726,510.09	0.05	6.03	-153.78	
2,438.00	0.70	271.80	2,437.73	4.92 N	11.23 W	504,519.32	726,510.07	0.05	6.04	-153.74	
2,440.00	0.69	271.76	2,439.73	4.92 N	11.26 W	504,519.32	726,510.04	0.05	6.04	-153.71	
2,442.00	0.69	271.73	2,441.72	4.93 N	11.28 W	504,519.33	726,510.02	0.05	6.04	-153.68	
2,444.00	0.69	271.69	2,443.72	4.93 N	11.30 W	504,519.33	726,510.00	0.05	6.05	-153.64	
2,446.00	0.69	271.66	2,445.72	4.93 N	11.33 W	504,519.33	726,509.97	0.05	6.05	-153.61	
2,448.00	0.69	271.63	2,447.72	4.93 N	11.35 W	504,519.33	726,509.95	0.05	6.05	-153.57	
2,450.00	0.69	271.59	2,449.72	4.93 N	11.38 W	504,519.33	726,509.92	0.05	6.05	-153.54	
2,452.00	0.69	271.56	2,451.72	4.93 N	11.40 W	504,519.33	726,509.90	0.05	6.06	-153.50	
2,454.00	0.69	271.52	2,453.72	4.93 N	11.42 W	504,519.33	726,509.88	0.05	6.06	-153.47	
2,456.00	0.69	271.49	2,455.72	4.93 N	11.45 W	504,519.33	726,509.85	0.05	6.06	-153.43	
2,458.00	0.69	271.45	2,457.72	4.93 N	11.47 W	504,519.33	726,509.83	0.05	6.07	-153.40	
2,460.00	0.69	271.42	2,459.72	4.93 N	11.50 W	504,519.33	726,509.80	0.05	6.07	-153.36	
2,462.00	0.69	271.38	2,461.72	4.93 N	11.52 W	504,519.33	726,509.78	0.05	6.07	-153.33	
2,464.00	0.68	271.34	2,463.72	4.93 N	11.54 W	504,519.33	726,509.76	0.05	6.08	-153.29	
2,466.00	0.68	271.31	2,465.72	4.93 N	11.57 W	504,519.33	726,509.73	0.05	6.08	-153.26	
2,468.00	0.68	271.27	2,467.72	4.93 N	11.59 W	504,519.33	726,509.71	0.05	6.08	-153.22	
2,470.00	0.68	271.24	2,469.72	4.93 N	11.62 W	504,519.33	726,509.68	0.05	6.09	-153.19	
2,472.00	0.68	271.20	2,471.72	4.93 N	11.64 W	504,519.33	726,509.66	0.05	6.09	-153.15	
2,474.00	0.68	271.17	2,473.72	4.94 N	11.66 W	504,519.34	726,509.64	0.05	6.09	-153.11	
2,476.00	0.68	271.13	2,475.72	4.94 N	11.69 W	504,519.34	726,509.61	0.05	6.09	-153.08	
2,478.00	0.68	271.09	2,477.72	4.94 N	11.71 W	504,519.34	726,509.59	0.05	6.10	-153.04	
2,480.00	0.68	271.06	2,479.72	4.94 N	11.73 W	504,519.34	726,509.57	0.05	6.10	-153.01	
2,482.00	0.68	271.02	2,481.72	4.94 N	11.76 W	504,519.34	726,509.54	0.05	6.10	-152.97	
2,484.00	0.68	270.99	2,483.72	4.94 N	11.78 W	504,519.34	726,509.52	0.05	6.11	-152.93	
2,486.00	0.68	270.95	2,485.72	4.94 N	11.80 W	504,519.34	726,509.50	0.05	6.11	-152.90	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
2,488.00	0.67	270.91	2,487.72	4.94 N	11.83 W	504,519.34	726,509.47	0.05	6.11	-152.86	
2,490.00	0.67	270.88	2,489.72	4.94 N	11.85 W	504,519.34	726,509.45	0.05	6.11	-152.83	
2,492.00	0.67	270.84	2,491.72	4.94 N	11.88 W	504,519.34	726,509.42	0.05	6.12	-152.79	
2,494.00	0.67	270.80	2,493.72	4.94 N	11.90 W	504,519.34	726,509.40	0.05	6.12	-152.75	
2,496.00	0.67	270.77	2,495.72	4.94 N	11.92 W	504,519.34	726,509.38	0.05	6.12	-152.72	
2,498.00	0.67	270.73	2,497.72	4.94 N	11.95 W	504,519.34	726,509.35	0.05	6.12	-152.68	
2,500.00	0.66	271.06	2,499.72	4.94 N	11.97 W	504,519.34	726,509.33	0.41	6.13	152.63	
2,502.00	0.66	271.39	2,501.72	4.94 N	11.99 W	504,519.34	726,509.31	0.41	6.13	152.31	
2,504.00	0.65	271.73	2,503.72	4.94 N	12.01 W	504,519.34	726,509.29	0.41	6.13	151.97	
2,506.00	0.64	272.08	2,505.72	4.94 N	12.04 W	504,519.34	726,509.26	0.41	6.14	151.63	
2,508.00	0.63	272.44	2,507.72	4.94 N	12.06 W	504,519.34	726,509.24	0.41	6.14	151.28	
2,510.00	0.63	272.80	2,509.72	4.94 N	12.08 W	504,519.34	726,509.22	0.41	6.14	150.93	
2,512.00	0.62	273.17	2,511.72	4.95 N	12.10 W	504,519.35	726,509.20	0.41	6.15	150.56	
2,514.00	0.61	273.56	2,513.72	4.95 N	12.12 W	504,519.35	726,509.18	0.41	6.15	150.19	
2,516.00	0.61	273.95	2,515.72	4.95 N	12.15 W	504,519.35	726,509.15	0.41	6.15	149.81	
2,518.00	0.60	274.35	2,517.72	4.95 N	12.17 W	504,519.35	726,509.13	0.41	6.16	149.42	
2,520.00	0.59	274.76	2,519.72	4.95 N	12.19 W	504,519.35	726,509.11	0.41	6.16	149.02	
2,522.00	0.58	275.18	2,521.72	4.95 N	12.21 W	504,519.35	726,509.09	0.41	6.16	148.61	
2,524.00	0.58	275.61	2,523.72	4.95 N	12.23 W	504,519.35	726,509.07	0.41	6.17	148.19	
2,526.00	0.57	276.05	2,525.72	4.96 N	12.25 W	504,519.36	726,509.05	0.41	6.17	147.76	
2,528.00	0.56	276.50	2,527.72	4.96 N	12.27 W	504,519.36	726,509.03	0.41	6.18	147.32	
2,530.00	0.56	276.96	2,529.72	4.96 N	12.29 W	504,519.36	726,509.01	0.41	6.18	146.87	
2,532.00	0.55	277.43	2,531.72	4.96 N	12.31 W	504,519.36	726,508.99	0.41	6.18	146.41	
2,534.00	0.54	277.92	2,533.72	4.97 N	12.32 W	504,519.37	726,508.98	0.41	6.19	145.93	
2,536.00	0.54	278.41	2,535.72	4.97 N	12.34 W	504,519.37	726,508.96	0.41	6.19	145.45	
2,538.00	0.53	278.92	2,537.72	4.97 N	12.36 W	504,519.37	726,508.94	0.41	6.20	144.95	
2,540.00	0.52	279.45	2,539.72	4.97 N	12.38 W	504,519.37	726,508.92	0.41	6.20	144.44	
2,542.00	0.52	279.98	2,541.72	4.98 N	12.40 W	504,519.38	726,508.90	0.41	6.21	143.92	
2,544.00	0.51	280.53	2,543.72	4.98 N	12.42 W	504,519.38	726,508.88	0.41	6.21	143.38	
2,546.00	0.50	281.10	2,545.72	4.98 N	12.43 W	504,519.38	726,508.87	0.41	6.22	142.83	
2,548.00	0.50	281.68	2,547.72	4.99 N	12.45 W	504,519.39	726,508.85	0.41	6.22	142.26	
2,550.00	0.49	282.27	2,549.72	4.99 N	12.47 W	504,519.39	726,508.83	0.41	6.23	141.68	
2,552.00	0.48	282.88	2,551.72	4.99 N	12.48 W	504,519.39	726,508.82	0.41	6.23	141.09	
2,554.00	0.48	283.51	2,553.72	5.00 N	12.50 W	504,519.40	726,508.80	0.41	6.24	140.48	
2,556.00	0.47	284.15	2,555.72	5.00 N	12.52 W	504,519.40	726,508.78	0.41	6.24	139.85	
2,558.00	0.47	284.81	2,557.72	5.01 N	12.53 W	504,519.41	726,508.77	0.41	6.25	139.21	
2,560.00	0.46	285.49	2,559.72	5.01 N	12.55 W	504,519.41	726,508.75	0.41	6.26	138.55	



Eddy County, NM (NAD83)

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Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
2,562.00	0.45	286.19	2,561.72	5.02 N	12.56 W	504,519.42	726,508.74	0.41	6.26	137.87	
2,564.00	0.45	286.90	2,563.72	5.02 N	12.58 W	504,519.42	726,508.72	0.41	6.27	137.17	
2,566.00	0.44	287.64	2,565.72	5.02 N	12.59 W	504,519.42	726,508.71	0.41	6.27	136.46	
2,568.00	0.44	288.39	2,567.72	5.03 N	12.61 W	504,519.43	726,508.69	0.41	6.28	135.72	
2,570.00	0.43	289.17	2,569.72	5.03 N	12.62 W	504,519.43	726,508.68	0.41	6.29	134.97	
2,572.00	0.42	289.96	2,571.72	5.04 N	12.64 W	504,519.44	726,508.66	0.41	6.29	134.20	
2,574.00	0.42	290.78	2,573.72	5.04 N	12.65 W	504,519.44	726,508.65	0.41	6.30	133.40	
2,576.00	0.41	291.62	2,575.72	5.05 N	12.66 W	504,519.45	726,508.64	0.41	6.31	132.58	
2,578.00	0.41	292.48	2,577.72	5.05 N	12.68 W	504,519.45	726,508.62	0.41	6.31	131.74	
2,580.00	0.40	293.37	2,579.72	5.06 N	12.69 W	504,519.46	726,508.61	0.41	6.32	130.88	
2,582.00	0.40	294.27	2,581.72	5.07 N	12.70 W	504,519.47	726,508.60	0.41	6.33	130.00	
2,584.00	0.39	295.21	2,583.72	5.07 N	12.71 W	504,519.47	726,508.59	0.41	6.33	129.09	
2,586.00	0.39	296.16	2,585.72	5.08 N	12.73 W	504,519.48	726,508.57	0.41	6.34	128.16	
2,588.00	0.38	297.14	2,587.72	5.08 N	12.74 W	504,519.48	726,508.56	0.41	6.35	127.20	
2,590.00	0.38	298.15	2,589.72	5.09 N	12.75 W	504,519.49	726,508.55	0.41	6.35	126.22	
2,592.00	0.37	299.18	2,591.72	5.10 N	12.76 W	504,519.50	726,508.54	0.41	6.36	125.21	
2,594.00	0.37	300.43	2,593.72	5.10 N	12.77 W	504,519.50	726,508.53	0.46	6.37	119.59	
2,596.00	0.36	301.91	2,595.72	5.11 N	12.78 W	504,519.51	726,508.52	0.51	6.38	114.68	
2,598.00	0.36	303.42	2,597.72	5.12 N	12.79 W	504,519.52	726,508.51	0.51	6.38	113.21	
2,600.00	0.36	304.95	2,599.72	5.12 N	12.80 W	504,519.52	726,508.50	0.51	6.39	111.70	
2,602.00	0.35	306.53	2,601.72	5.13 N	12.81 W	504,519.53	726,508.49	0.51	6.40	110.16	
2,604.00	0.35	308.13	2,603.72	5.14 N	12.82 W	504,519.54	726,508.48	0.51	6.41	108.59	
2,606.00	0.35	309.75	2,605.72	5.14 N	12.83 W	504,519.54	726,508.47	0.51	6.42	106.99	
2,608.00	0.34	311.41	2,607.72	5.15 N	12.84 W	504,519.55	726,508.46	0.51	6.43	105.37	
2,610.00	0.34	313.08	2,609.72	5.16 N	12.85 W	504,519.56	726,508.45	0.51	6.44	103.71	
2,612.00	0.34	314.78	2,611.72	5.17 N	12.86 W	504,519.57	726,508.44	0.51	6.44	102.04	
2,614.00	0.34	316.50	2,613.72	5.18 N	12.87 W	504,519.58	726,508.43	0.51	6.45	100.34	
2,616.00	0.34	318.23	2,615.72	5.19 N	12.88 W	504,519.59	726,508.42	0.51	6.46	98.62	
2,618.00	0.34	319.98	2,617.72	5.20 N	12.88 W	504,519.60	726,508.42	0.51	6.47	96.89	
2,620.00	0.33	321.73	2,619.72	5.20 N	12.89 W	504,519.60	726,508.41	0.51	6.48	95.14	
2,622.00	0.33	323.49	2,621.72	5.21 N	12.90 W	504,519.61	726,508.40	0.51	6.49	93.39	
2,624.00	0.33	325.26	2,623.72	5.22 N	12.91 W	504,519.62	726,508.39	0.51	6.50	91.63	
2,626.00	0.33	327.02	2,625.72	5.23 N	12.91 W	504,519.63	726,508.39	0.51	6.51	89.86	
2,628.00	0.33	328.78	2,627.72	5.24 N	12.92 W	504,519.64	726,508.38	0.51	6.52	88.10	
2,630.00	0.34	330.54	2,629.72	5.25 N	12.92 W	504,519.65	726,508.38	0.51	6.53	86.34	
2,632.00	0.34	332.28	2,631.72	5.26 N	12.93 W	504,519.66	726,508.37	0.51	6.55	84.58	
2,634.00	0.34	334.01	2,633.72	5.27 N	12.94 W	504,519.67	726,508.36	0.51	6.56	82.84	



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Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
2,636.00	0.34	335.72	2,635.72	5.28 N	12.94 W	504,519.68	726,508.36	0.51	6.57	81.11	
2,638.00	0.34	337.42	2,637.72	5.29 N	12.95 W	504,519.69	726,508.35	0.51	6.58	79.40	
2,640.00	0.34	339.09	2,639.72	5.31 N	12.95 W	504,519.71	726,508.35	0.51	6.59	77.70	
2,642.00	0.35	340.74	2,641.72	5.32 N	12.95 W	504,519.72	726,508.35	0.51	6.60	76.03	
2,644.00	0.35	342.37	2,643.72	5.33 N	12.96 W	504,519.73	726,508.34	0.51	6.61	74.38	
2,646.00	0.35	343.96	2,645.72	5.34 N	12.96 W	504,519.74	726,508.34	0.51	6.63	72.75	
2,648.00	0.36	345.53	2,647.72	5.35 N	12.96 W	504,519.75	726,508.34	0.51	6.64	71.16	
2,650.00	0.36	347.06	2,649.72	5.36 N	12.97 W	504,519.76	726,508.33	0.51	6.65	69.59	
2,652.00	0.36	348.56	2,651.72	5.38 N	12.97 W	504,519.78	726,508.33	0.51	6.66	68.06	
2,654.00	0.37	350.03	2,653.72	5.39 N	12.97 W	504,519.79	726,508.33	0.51	6.68	66.56	
2,656.00	0.37	351.47	2,655.72	5.40 N	12.97 W	504,519.80	726,508.33	0.51	6.69	65.09	
2,658.00	0.38	352.87	2,657.72	5.42 N	12.98 W	504,519.82	726,508.32	0.51	6.70	63.65	
2,660.00	0.38	354.23	2,659.72	5.43 N	12.98 W	504,519.83	726,508.32	0.51	6.71	62.25	
2,662.00	0.39	355.56	2,661.72	5.44 N	12.98 W	504,519.84	726,508.32	0.51	6.73	60.89	
2,664.00	0.39	356.85	2,663.72	5.46 N	12.98 W	504,519.86	726,508.32	0.51	6.74	59.56	
2,666.00	0.40	358.11	2,665.72	5.47 N	12.98 W	504,519.87	726,508.32	0.51	6.76	58.27	
2,668.00	0.40	359.34	2,667.72	5.48 N	12.98 W	504,519.88	726,508.32	0.51	6.77	57.01	
2,670.00	0.41	0.53	2,669.72	5.50 N	12.98 W	504,519.90	726,508.32	0.51	6.78	55.78	
2,672.00	0.42	1.68	2,671.72	5.51 N	12.98 W	504,519.91	726,508.32	0.51	6.80	54.59	
2,674.00	0.42	2.80	2,673.72	5.53 N	12.98 W	504,519.93	726,508.32	0.51	6.81	53.44	
2,676.00	0.43	3.89	2,675.72	5.54 N	12.98 W	504,519.94	726,508.32	0.51	6.83	52.32	
2,678.00	0.44	4.95	2,677.72	5.56 N	12.98 W	504,519.96	726,508.32	0.51	6.84	51.23	
2,680.00	0.44	5.98	2,679.72	5.57 N	12.98 W	504,519.97	726,508.32	0.51	6.86	50.17	
2,682.00	0.45	6.97	2,681.72	5.59 N	12.97 W	504,519.99	726,508.33	0.51	6.87	49.14	
2,684.00	0.46	7.93	2,683.72	5.60 N	12.97 W	504,520.00	726,508.33	0.51	6.89	48.15	
2,686.00	0.46	8.87	2,685.72	5.62 N	12.97 W	504,520.02	726,508.33	0.51	6.90	47.19	
2,688.00	0.47	9.78	2,687.72	5.63 N	12.97 W	504,520.03	726,508.33	0.51	6.92	46.25	
2,690.00	0.48	10.66	2,689.71	5.65 N	12.96 W	504,520.05	726,508.34	0.51	6.93	45.34	
2,692.00	0.48	11.51	2,691.71	5.67 N	12.96 W	504,520.07	726,508.34	0.51	6.95	44.46	
2,694.00	0.49	12.34	2,693.71	5.68 N	12.96 W	504,520.08	726,508.34	0.51	6.97	43.61	
2,696.00	0.50	13.14	2,695.71	5.70 N	12.95 W	504,520.10	726,508.35	0.51	6.98	42.78	
2,698.00	0.51	13.91	2,697.71	5.72 N	12.95 W	504,520.12	726,508.35	0.51	7.00	41.98	
2,700.00	0.52	14.67	2,699.71	5.74 N	12.95 W	504,520.14	726,508.35	0.51	7.02	41.21	
2,702.00	0.52	15.40	2,701.71	5.75 N	12.94 W	504,520.15	726,508.36	0.51	7.03	40.45	
2,704.00	0.53	16.11	2,703.71	5.77 N	12.94 W	504,520.17	726,508.36	0.51	7.05	39.72	
2,706.00	0.54	16.80	2,705.71	5.79 N	12.93 W	504,520.19	726,508.37	0.51	7.07	39.01	

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Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
2,708.00	0.55	17.47	2,707.71	5.81 N	12.93 W	504,520.21	726,508.37	0.51	7.09	38.32	
2,710.00	0.56	18.12	2,709.71	5.83 N	12.92 W	504,520.23	726,508.38	0.51	7.10	37.65	
2,712.00	0.56	18.75	2,711.71	5.84 N	12.91 W	504,520.24	726,508.39	0.51	7.12	37.00	
2,714.00	0.57	19.36	2,713.71	5.86 N	12.91 W	504,520.26	726,508.39	0.51	7.14	36.37	
2,716.00	0.58	19.95	2,715.71	5.88 N	12.90 W	504,520.28	726,508.40	0.51	7.16	35.76	
2,718.00	0.59	20.53	2,717.71	5.90 N	12.89 W	504,520.30	726,508.41	0.51	7.18	35.17	
2,720.00	0.60	21.09	2,719.71	5.92 N	12.89 W	504,520.32	726,508.41	0.51	7.19	34.59	
2,722.00	0.61	21.64	2,721.71	5.94 N	12.88 W	504,520.34	726,508.42	0.51	7.21	34.03	
2,724.00	0.61	22.16	2,723.71	5.96 N	12.87 W	504,520.36	726,508.43	0.51	7.23	33.49	
2,726.00	0.62	22.68	2,725.71	5.98 N	12.86 W	504,520.38	726,508.44	0.51	7.25	32.96	
2,728.00	0.63	23.18	2,727.71	6.00 N	12.85 W	504,520.40	726,508.45	0.51	7.27	32.44	
2,730.00	0.64	23.67	2,729.71	6.02 N	12.84 W	504,520.42	726,508.46	0.51	7.29	31.94	
2,732.00	0.65	24.14	2,731.71	6.04 N	12.84 W	504,520.44	726,508.46	0.51	7.31	31.45	
2,734.00	0.66	24.60	2,733.71	6.06 N	12.83 W	504,520.46	726,508.47	0.51	7.33	30.98	
2,736.00	0.67	25.05	2,735.71	6.08 N	12.82 W	504,520.48	726,508.48	0.51	7.35	30.52	
2,738.00	0.68	25.49	2,737.71	6.10 N	12.81 W	504,520.50	726,508.49	0.51	7.37	30.07	
2,740.00	0.68	25.92	2,739.71	6.12 N	12.80 W	504,520.52	726,508.50	0.51	7.39	29.63	
2,742.00	0.69	26.33	2,741.71	6.15 N	12.79 W	504,520.55	726,508.51	0.51	7.41	29.21	
2,744.00	0.70	26.73	2,743.71	6.17 N	12.77 W	504,520.57	726,508.53	0.51	7.43	28.79	
2,746.00	0.71	27.13	2,745.71	6.19 N	12.76 W	504,520.59	726,508.54	0.51	7.45	28.39	
2,748.00	0.72	27.51	2,747.71	6.21 N	12.75 W	504,520.61	726,508.55	0.51	7.47	27.99	
2,750.00	0.73	27.89	2,749.71	6.23 N	12.74 W	504,520.63	726,508.56	0.51	7.49	27.61	
2,752.00	0.74	28.25	2,751.71	6.26 N	12.73 W	504,520.66	726,508.57	0.51	7.51	27.23	
2,754.00	0.75	28.61	2,753.71	6.28 N	12.72 W	504,520.68	726,508.58	0.51	7.54	26.87	
2,756.00	0.76	28.95	2,755.71	6.30 N	12.70 W	504,520.70	726,508.60	0.51	7.56	26.51	
2,758.00	0.77	29.29	2,757.71	6.33 N	12.69 W	504,520.73	726,508.61	0.51	7.58	26.17	
2,760.00	0.78	29.62	2,759.71	6.35 N	12.68 W	504,520.75	726,508.62	0.51	7.60	25.83	
2,762.00	0.79	29.95	2,761.71	6.37 N	12.66 W	504,520.77	726,508.64	0.51	7.62	25.50	
2,764.00	0.80	30.26	2,763.71	6.40 N	12.65 W	504,520.80	726,508.65	0.51	7.65	25.17	
2,766.00	0.80	30.57	2,765.71	6.42 N	12.63 W	504,520.82	726,508.67	0.51	7.67	24.86	
2,768.00	0.81	30.87	2,767.71	6.45 N	12.62 W	504,520.85	726,508.68	0.51	7.69	24.55	
2,770.00	0.82	31.17	2,769.71	6.47 N	12.61 W	504,520.87	726,508.69	0.51	7.71	24.25	
2,772.00	0.83	31.45	2,771.71	6.49 N	12.59 W	504,520.89	726,508.71	0.51	7.74	23.95	
2,774.00	0.84	31.74	2,773.71	6.52 N	12.58 W	504,520.92	726,508.72	0.51	7.76	23.67	
2,776.00	0.85	32.01	2,775.71	6.54 N	12.56 W	504,520.94	726,508.74	0.51	7.78	23.39	
2,778.00	0.86	32.28	2,777.71	6.57 N	12.54 W	504,520.97	726,508.76	0.51	7.81	23.11	
2,780.00	0.87	32.54	2,779.71	6.60 N	12.53 W	504,521.00	726,508.77	0.51	7.83	22.84	

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Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
2,782.00	0.88	32.80	2,781.71	6.62 N	12.51 W	504,521.02	726,508.79	0.51	7.85	22.58	
2,784.00	0.88	33.19	2,783.71	6.65 N	12.49 W	504,521.05	726,508.81	0.33	7.88	114.99	
2,786.00	0.87	33.58	2,785.71	6.67 N	12.48 W	504,521.07	726,508.82	0.33	7.90	114.60	
2,788.00	0.87	33.97	2,787.71	6.70 N	12.46 W	504,521.10	726,508.84	0.33	7.93	114.21	
2,790.00	0.87	34.36	2,789.71	6.72 N	12.44 W	504,521.12	726,508.86	0.33	7.95	113.82	
2,792.00	0.87	34.76	2,791.71	6.75 N	12.43 W	504,521.15	726,508.87	0.33	7.97	113.43	
2,794.00	0.86	35.16	2,793.71	6.77 N	12.41 W	504,521.17	726,508.89	0.33	7.99	113.03	
2,796.00	0.86	35.56	2,795.71	6.80 N	12.39 W	504,521.20	726,508.91	0.33	8.02	112.63	
2,798.00	0.86	35.96	2,797.71	6.82 N	12.37 W	504,521.22	726,508.93	0.33	8.04	112.23	
2,800.00	0.86	36.37	2,799.71	6.85 N	12.36 W	504,521.25	726,508.94	0.33	8.06	111.83	
2,802.00	0.85	36.77	2,801.71	6.87 N	12.34 W	504,521.27	726,508.96	0.33	8.08	111.42	
2,804.00	0.85	37.18	2,803.71	6.89 N	12.32 W	504,521.29	726,508.98	0.33	8.11	111.01	
2,806.00	0.85	37.60	2,805.71	6.92 N	12.30 W	504,521.32	726,509.00	0.33	8.13	110.60	
2,808.00	0.85	38.01	2,807.71	6.94 N	12.28 W	504,521.34	726,509.02	0.33	8.15	110.19	
2,810.00	0.85	38.43	2,809.71	6.96 N	12.27 W	504,521.36	726,509.03	0.33	8.17	109.78	
2,812.00	0.84	38.84	2,811.71	6.99 N	12.25 W	504,521.39	726,509.05	0.33	8.19	109.36	
2,814.00	0.84	39.27	2,813.70	7.01 N	12.23 W	504,521.41	726,509.07	0.33	8.21	108.94	
2,816.00	0.84	39.69	2,815.70	7.03 N	12.21 W	504,521.43	726,509.09	0.33	8.23	108.52	
2,818.00	0.84	40.11	2,817.70	7.05 N	12.19 W	504,521.45	726,509.11	0.33	8.25	108.10	
2,820.00	0.84	40.54	2,819.70	7.08 N	12.17 W	504,521.48	726,509.13	0.33	8.27	107.67	
2,822.00	0.83	40.97	2,821.70	7.10 N	12.15 W	504,521.50	726,509.15	0.33	8.29	107.25	
2,824.00	0.83	41.40	2,823.70	7.12 N	12.13 W	504,521.52	726,509.17	0.33	8.31	106.82	
2,826.00	0.83	41.83	2,825.70	7.14 N	12.12 W	504,521.54	726,509.18	0.33	8.33	106.39	
2,828.00	0.83	42.27	2,827.70	7.16 N	12.10 W	504,521.56	726,509.20	0.33	8.35	105.95	
2,830.00	0.83	42.70	2,829.70	7.19 N	12.08 W	504,521.59	726,509.22	0.33	8.37	105.52	
2,832.00	0.82	43.14	2,831.70	7.21 N	12.06 W	504,521.61	726,509.24	0.33	8.39	105.08	
2,834.00	0.82	43.58	2,833.70	7.23 N	12.04 W	504,521.63	726,509.26	0.33	8.41	104.65	
2,836.00	0.82	44.02	2,835.70	7.25 N	12.02 W	504,521.65	726,509.28	0.33	8.43	104.21	
2,838.00	0.82	44.47	2,837.70	7.27 N	12.00 W	504,521.67	726,509.30	0.33	8.45	103.76	
2,840.00	0.82	44.91	2,839.70	7.29 N	11.98 W	504,521.69	726,509.32	0.33	8.46	103.32	
2,842.00	0.82	45.36	2,841.70	7.31 N	11.96 W	504,521.71	726,509.34	0.33	8.48	102.88	
2,844.00	0.82	45.81	2,843.70	7.33 N	11.94 W	504,521.73	726,509.36	0.33	8.50	102.43	
2,846.00	0.81	46.26	2,845.70	7.35 N	11.92 W	504,521.75	726,509.38	0.33	8.52	101.98	
2,848.00	0.81	46.71	2,847.70	7.37 N	11.90 W	504,521.77	726,509.40	0.33	8.54	101.53	
2,850.00	0.81	47.16	2,849.70	7.39 N	11.88 W	504,521.79	726,509.42	0.33	8.55	101.08	
2,852.00	0.81	47.61	2,851.70	7.41 N	11.85 W	504,521.81	726,509.45	0.33	8.57	100.63	
2,854.00	0.81	48.07	2,853.70	7.43 N	11.83 W	504,521.83	726,509.47	0.33	8.59	100.17	



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Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
2,856.00	0.81	48.53	2,855.70	7.44 N	11.81 W	504,521.84	726,509.49	0.33	8.60	99.72	
2,858.00	0.81	48.98	2,857.70	7.46 N	11.79 W	504,521.86	726,509.51	0.33	8.62	99.26	
2,860.00	0.81	49.44	2,859.70	7.48 N	11.77 W	504,521.88	726,509.53	0.33	8.64	98.80	
2,862.00	0.81	49.90	2,861.70	7.50 N	11.75 W	504,521.90	726,509.55	0.33	8.65	98.35	
2,864.00	0.80	50.36	2,863.70	7.52 N	11.73 W	504,521.92	726,509.57	0.33	8.67	97.89	
2,866.00	0.80	50.83	2,865.70	7.54 N	11.71 W	504,521.94	726,509.59	0.33	8.68	97.42	
2,868.00	0.80	51.29	2,867.70	7.55 N	11.68 W	504,521.95	726,509.62	0.33	8.70	96.96	
2,870.00	0.80	51.75	2,869.70	7.57 N	11.66 W	504,521.97	726,509.64	0.33	8.71	96.50	
2,872.00	0.80	52.22	2,871.70	7.59 N	11.64 W	504,521.99	726,509.66	0.33	8.73	96.04	
2,874.00	0.80	52.68	2,873.70	7.61 N	11.62 W	504,522.01	726,509.68	0.33	8.74	95.57	
2,876.00	0.80	53.15	2,875.70	7.62 N	11.59 W	504,522.02	726,509.71	0.33	8.76	95.11	
2,878.00	0.80	53.38	2,877.70	7.64 N	11.57 W	504,522.04	726,509.73	0.16	8.77	94.64	
2,880.00	0.80	53.38	2,879.70	7.66 N	11.55 W	504,522.06	726,509.75	0.00	8.79	0.00	
2,882.00	0.81	53.28	2,881.70	7.67 N	11.53 W	504,522.07	726,509.77	0.31	8.80	-13.31	
2,884.00	0.81	53.24	2,883.70	7.69 N	11.50 W	504,522.09	726,509.80	0.12	8.81	-13.21	
2,886.00	0.81	53.20	2,885.70	7.71 N	11.48 W	504,522.11	726,509.82	0.12	8.83	-13.17	
2,888.00	0.81	53.16	2,887.70	7.72 N	11.46 W	504,522.12	726,509.84	0.12	8.84	-13.13	
2,890.00	0.82	53.12	2,889.70	7.74 N	11.44 W	504,522.14	726,509.86	0.12	8.86	-13.09	
2,892.00	0.82	53.08	2,891.70	7.76 N	11.41 W	504,522.16	726,509.89	0.12	8.87	-13.05	
2,894.00	0.82	53.04	2,893.70	7.77 N	11.39 W	504,522.17	726,509.91	0.12	8.89	-13.01	
2,896.00	0.82	53.00	2,895.70	7.79 N	11.37 W	504,522.19	726,509.93	0.12	8.90	-12.97	
2,898.00	0.83	52.96	2,897.70	7.81 N	11.35 W	504,522.21	726,509.95	0.12	8.92	-12.93	
2,900.00	0.83	52.92	2,899.70	7.83 N	11.32 W	504,522.23	726,509.98	0.12	8.93	-12.89	
2,902.00	0.83	52.89	2,901.70	7.84 N	11.30 W	504,522.24	726,510.00	0.12	8.95	-12.86	
2,904.00	0.83	52.85	2,903.70	7.86 N	11.28 W	504,522.26	726,510.02	0.12	8.96	-12.82	
2,906.00	0.84	52.81	2,905.70	7.88 N	11.25 W	504,522.28	726,510.05	0.12	8.98	-12.78	
2,908.00	0.84	52.77	2,907.70	7.90 N	11.23 W	504,522.30	726,510.07	0.12	8.99	-12.74	
2,910.00	0.84	52.74	2,909.70	7.91 N	11.21 W	504,522.31	726,510.09	0.12	9.01	-12.70	
2,912.00	0.84	52.70	2,911.69	7.93 N	11.18 W	504,522.33	726,510.12	0.12	9.02	-12.67	
2,914.00	0.84	52.66	2,913.69	7.95 N	11.16 W	504,522.35	726,510.14	0.12	9.04	-12.63	
2,916.00	0.85	52.63	2,915.69	7.97 N	11.14 W	504,522.37	726,510.16	0.12	9.05	-12.59	
2,918.00	0.85	52.59	2,917.69	7.99 N	11.11 W	504,522.39	726,510.19	0.12	9.07	-12.56	
2,920.00	0.85	52.55	2,919.69	8.00 N	11.09 W	504,522.40	726,510.21	0.12	9.09	-12.52	
2,922.00	0.85	52.52	2,921.69	8.02 N	11.07 W	504,522.42	726,510.23	0.12	9.10	-12.48	
2,924.00	0.86	52.48	2,923.69	8.04 N	11.04 W	504,522.44	726,510.26	0.12	9.12	-12.45	
2,926.00	0.86	52.45	2,925.69	8.06 N	11.02 W	504,522.46	726,510.28	0.12	9.13	-12.41	

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				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
2,928.00	0.86	52.41	2,927.69	8.08 N	10.99 W	504,522.48	726,510.31	0.12	9.15	-12.38	
2,930.00	0.86	52.37	2,929.69	8.09 N	10.97 W	504,522.49	726,510.33	0.12	9.16	-12.34	
2,932.00	0.87	52.34	2,931.69	8.11 N	10.95 W	504,522.51	726,510.35	0.12	9.18	-12.31	
2,934.00	0.87	52.30	2,933.69	8.13 N	10.92 W	504,522.53	726,510.38	0.12	9.20	-12.27	
2,936.00	0.87	52.27	2,935.69	8.15 N	10.90 W	504,522.55	726,510.40	0.12	9.21	-12.24	
2,938.00	0.87	52.24	2,937.69	8.17 N	10.87 W	504,522.57	726,510.43	0.12	9.23	-12.20	
2,940.00	0.88	52.20	2,939.69	8.19 N	10.85 W	504,522.59	726,510.45	0.12	9.24	-12.17	
2,942.00	0.88	52.17	2,941.69	8.21 N	10.83 W	504,522.61	726,510.47	0.12	9.26	-12.13	
2,944.00	0.88	52.13	2,943.69	8.23 N	10.80 W	504,522.63	726,510.50	0.12	9.28	-12.10	
2,946.00	0.88	52.10	2,945.69	8.24 N	10.78 W	504,522.64	726,510.52	0.12	9.29	-12.07	
2,948.00	0.89	52.07	2,947.69	8.26 N	10.75 W	504,522.66	726,510.55	0.12	9.31	-12.03	
2,950.00	0.89	52.03	2,949.69	8.28 N	10.73 W	504,522.68	726,510.57	0.12	9.33	-12.00	
2,952.00	0.89	52.00	2,951.69	8.30 N	10.70 W	504,522.70	726,510.60	0.12	9.34	-11.96	
2,954.00	0.89	51.97	2,953.69	8.32 N	10.68 W	504,522.72	726,510.62	0.12	9.36	-11.93	
2,956.00	0.90	51.93	2,955.69	8.34 N	10.65 W	504,522.74	726,510.65	0.12	9.38	-11.90	
2,958.00	0.90	51.90	2,957.69	8.36 N	10.63 W	504,522.76	726,510.67	0.12	9.39	-11.87	
2,960.00	0.90	51.87	2,959.69	8.38 N	10.61 W	504,522.78	726,510.69	0.12	9.41	-11.83	
2,962.00	0.90	51.84	2,961.69	8.40 N	10.58 W	504,522.80	726,510.72	0.12	9.43	-11.80	
2,964.00	0.91	51.80	2,963.69	8.42 N	10.56 W	504,522.82	726,510.74	0.12	9.44	-11.77	
2,966.00	0.91	51.77	2,965.69	8.44 N	10.53 W	504,522.84	726,510.77	0.12	9.46	-11.74	
2,968.00	0.91	51.74	2,967.69	8.46 N	10.51 W	504,522.86	726,510.79	0.12	9.48	-11.70	
2,970.00	0.91	51.71	2,969.69	8.48 N	10.48 W	504,522.88	726,510.82	0.12	9.49	-11.67	
2,972.00	0.92	51.68	2,971.69	8.50 N	10.46 W	504,522.90	726,510.84	0.12	9.51	-11.64	
2,974.00	0.92	51.65	2,973.69	8.52 N	10.43 W	504,522.92	726,510.87	0.12	9.53	-11.61	
2,976.00	0.92	51.62	2,975.69	8.54 N	10.41 W	504,522.94	726,510.89	0.12	9.55	-11.58	
2,978.00	0.92	51.58	2,977.69	8.56 N	10.38 W	504,522.96	726,510.92	0.12	9.56	-11.55	
2,980.00	0.93	51.55	2,979.69	8.58 N	10.36 W	504,522.98	726,510.94	0.12	9.58	-11.52	
2,982.00	0.93	51.52	2,981.69	8.60 N	10.33 W	504,523.00	726,510.97	0.12	9.60	-11.49	
2,984.00	0.93	51.49	2,983.69	8.62 N	10.30 W	504,523.02	726,511.00	0.12	9.62	-11.46	
2,986.00	0.93	51.46	2,985.69	8.64 N	10.28 W	504,523.04	726,511.02	0.12	9.63	-11.42	
2,988.00	0.93	51.43	2,987.69	8.66 N	10.25 W	504,523.06	726,511.05	0.12	9.65	-11.39	
2,990.00	0.94	51.40	2,989.69	8.68 N	10.23 W	504,523.08	726,511.07	0.12	9.67	-11.36	
2,992.00	0.94	51.37	2,991.69	8.70 N	10.20 W	504,523.10	726,511.10	0.12	9.69	-11.33	
2,994.00	0.94	51.34	2,993.68	8.72 N	10.18 W	504,523.12	726,511.12	0.12	9.70	-11.30	
2,996.00	0.94	51.31	2,995.68	8.74 N	10.15 W	504,523.14	726,511.15	0.12	9.72	-11.28	
2,998.00	0.95	51.28	2,997.68	8.76 N	10.13 W	504,523.16	726,511.17	0.12	9.74	-11.25	
3,000.00	0.95	51.26	2,999.68	8.78 N	10.10 W	504,523.18	726,511.20	0.12	9.76	-11.22	



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Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
3,002.00	0.95	51.23	3,001.68	8.80 N	10.07 W	504,523.20	726,511.23	0.12	9.78	-11.19	
3,004.00	0.95	51.20	3,003.68	8.82 N	10.05 W	504,523.22	726,511.25	0.12	9.79	-11.16	
3,006.00	0.96	51.17	3,005.68	8.84 N	10.02 W	504,523.24	726,511.28	0.12	9.81	-11.13	
3,008.00	0.96	51.14	3,007.68	8.86 N	10.00 W	504,523.26	726,511.30	0.12	9.83	-11.10	
3,010.00	0.96	51.11	3,009.68	8.88 N	9.97 W	504,523.28	726,511.33	0.12	9.85	-11.07	
3,012.00	0.96	51.08	3,011.68	8.91 N	9.94 W	504,523.31	726,511.36	0.12	9.87	-11.04	
3,014.00	0.97	51.06	3,013.68	8.93 N	9.92 W	504,523.33	726,511.38	0.12	9.89	-11.02	
3,016.00	0.97	51.03	3,015.68	8.95 N	9.89 W	504,523.35	726,511.41	0.12	9.90	-10.99	
3,018.00	0.97	51.00	3,017.68	8.97 N	9.86 W	504,523.37	726,511.44	0.12	9.92	-10.96	
3,020.00	0.97	50.97	3,019.68	8.99 N	9.84 W	504,523.39	726,511.46	0.12	9.94	-10.93	
3,022.00	0.98	50.94	3,021.68	9.01 N	9.81 W	504,523.41	726,511.49	0.12	9.96	-10.90	
3,024.00	0.98	50.92	3,023.68	9.03 N	9.79 W	504,523.43	726,511.51	0.12	9.98	-10.88	
3,026.00	0.98	50.89	3,025.68	9.06 N	9.76 W	504,523.46	726,511.54	0.12	10.00	-10.85	
3,028.00	0.98	50.86	3,027.68	9.08 N	9.73 W	504,523.48	726,511.57	0.12	10.02	-10.82	
3,030.00	0.99	50.83	3,029.68	9.10 N	9.71 W	504,523.50	726,511.59	0.12	10.03	-10.79	
3,032.00	0.99	50.81	3,031.68	9.12 N	9.68 W	504,523.52	726,511.62	0.12	10.05	-10.77	
3,034.00	0.99	50.78	3,033.68	9.14 N	9.65 W	504,523.54	726,511.65	0.12	10.07	-10.74	
3,036.00	0.99	50.75	3,035.68	9.16 N	9.63 W	504,523.56	726,511.67	0.12	10.09	-10.71	
3,038.00	1.00	50.73	3,037.68	9.19 N	9.60 W	504,523.59	726,511.70	0.12	10.11	-10.69	
3,040.00	1.00	50.70	3,039.68	9.21 N	9.57 W	504,523.61	726,511.73	0.12	10.13	-10.66	
3,042.00	1.00	50.68	3,041.68	9.23 N	9.54 W	504,523.63	726,511.76	0.12	10.15	-10.63	
3,044.00	1.00	50.65	3,043.68	9.25 N	9.52 W	504,523.65	726,511.78	0.12	10.17	-10.61	
3,046.00	1.01	50.62	3,045.68	9.27 N	9.49 W	504,523.67	726,511.81	0.12	10.19	-10.58	
3,048.00	1.01	50.60	3,047.68	9.30 N	9.46 W	504,523.70	726,511.84	0.12	10.21	-10.56	
3,050.00	1.01	50.57	3,049.68	9.32 N	9.44 W	504,523.72	726,511.86	0.12	10.23	-10.53	
3,052.00	1.01	50.55	3,051.68	9.34 N	9.41 W	504,523.74	726,511.89	0.12	10.25	-10.50	
3,054.00	1.02	50.52	3,053.68	9.36 N	9.38 W	504,523.76	726,511.92	0.12	10.27	-10.48	
3,056.00	1.02	50.50	3,055.68	9.39 N	9.35 W	504,523.79	726,511.95	0.12	10.29	-10.45	
3,058.00	1.02	50.47	3,057.68	9.41 N	9.33 W	504,523.81	726,511.97	0.12	10.31	-10.43	
3,060.00	1.02	50.44	3,059.68	9.43 N	9.30 W	504,523.83	726,512.00	0.12	10.33	-10.40	
3,062.00	1.03	50.42	3,061.67	9.46 N	9.27 W	504,523.86	726,512.03	0.12	10.35	-10.38	
3,064.00	1.03	50.39	3,063.67	9.48 N	9.24 W	504,523.88	726,512.06	0.12	10.37	-10.35	
3,066.00	1.03	50.37	3,065.67	9.50 N	9.22 W	504,523.90	726,512.08	0.12	10.39	-10.33	
3,068.00	1.03	50.37	3,067.67	9.52 N	9.19 W	504,523.92	726,512.11	0.00	10.41	-0.04	
3,070.00	1.04	50.15	3,069.67	9.55 N	9.16 W	504,523.95	726,512.14	0.40	10.43	-29.63	
3,072.00	1.04	50.04	3,071.67	9.57 N	9.13 W	504,523.97	726,512.17	0.20	10.45	-29.41	
3,074.00	1.04	49.93	3,073.67	9.59 N	9.11 W	504,523.99	726,512.19	0.20	10.47	-29.30	

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Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
3,076.00	1.05	49.83	3,075.67	9.62 N	9.08 W	504,524.02	726,512.22	0.20	10.49	-29.19	
3,078.00	1.05	49.72	3,077.67	9.64 N	9.05 W	504,524.04	726,512.25	0.20	10.51	-29.08	
3,080.00	1.05	49.61	3,079.67	9.66 N	9.02 W	504,524.06	726,512.28	0.20	10.53	-28.98	
3,082.00	1.06	49.51	3,081.67	9.69 N	8.99 W	504,524.09	726,512.31	0.20	10.55	-28.87	
3,084.00	1.06	49.40	3,083.67	9.71 N	8.97 W	504,524.11	726,512.33	0.20	10.57	-28.77	
3,086.00	1.07	49.30	3,085.67	9.74 N	8.94 W	504,524.14	726,512.36	0.20	10.59	-28.66	
3,088.00	1.07	49.20	3,087.67	9.76 N	8.91 W	504,524.16	726,512.39	0.20	10.61	-28.56	
3,090.00	1.07	49.09	3,089.67	9.79 N	8.88 W	504,524.19	726,512.42	0.20	10.63	-28.45	
3,092.00	1.08	48.99	3,091.67	9.81 N	8.85 W	504,524.21	726,512.45	0.20	10.66	-28.35	
3,094.00	1.08	48.89	3,093.67	9.83 N	8.82 W	504,524.23	726,512.48	0.20	10.68	-28.25	
3,096.00	1.08	48.79	3,095.67	9.86 N	8.80 W	504,524.26	726,512.50	0.20	10.70	-28.15	
3,098.00	1.09	48.69	3,097.67	9.88 N	8.77 W	504,524.28	726,512.53	0.20	10.72	-28.05	
3,100.00	1.09	48.59	3,099.67	9.91 N	8.74 W	504,524.31	726,512.56	0.20	10.74	-27.95	
3,102.00	1.09	48.49	3,101.67	9.93 N	8.71 W	504,524.33	726,512.59	0.20	10.77	-27.85	
3,104.00	1.10	48.39	3,103.67	9.96 N	8.68 W	504,524.36	726,512.62	0.20	10.79	-27.75	
3,106.00	1.10	48.30	3,105.67	9.99 N	8.65 W	504,524.39	726,512.65	0.20	10.81	-27.65	
3,108.00	1.10	48.20	3,107.67	10.01 N	8.62 W	504,524.41	726,512.68	0.20	10.83	-27.56	
3,110.00	1.11	48.10	3,109.67	10.04 N	8.60 W	504,524.44	726,512.70	0.20	10.86	-27.46	
3,112.00	1.11	48.01	3,111.67	10.06 N	8.57 W	504,524.46	726,512.73	0.20	10.88	-27.36	
3,114.00	1.12	47.91	3,113.67	10.09 N	8.54 W	504,524.49	726,512.76	0.20	10.90	-27.27	
3,116.00	1.12	47.82	3,115.67	10.12 N	8.51 W	504,524.52	726,512.79	0.20	10.92	-27.17	
3,118.00	1.12	47.73	3,117.67	10.14 N	8.48 W	504,524.54	726,512.82	0.20	10.95	-27.08	
3,120.00	1.13	47.63	3,119.66	10.17 N	8.45 W	504,524.57	726,512.85	0.20	10.97	-26.98	
3,122.00	1.13	47.54	3,121.66	10.19 N	8.42 W	504,524.59	726,512.88	0.20	10.99	-26.89	
3,124.00	1.13	47.45	3,123.66	10.22 N	8.39 W	504,524.62	726,512.91	0.20	11.02	-26.80	
3,126.00	1.14	47.36	3,125.66	10.25 N	8.36 W	504,524.65	726,512.94	0.20	11.04	-26.71	
3,128.00	1.14	47.27	3,127.66	10.27 N	8.33 W	504,524.67	726,512.97	0.20	11.07	-26.62	
3,130.00	1.14	47.18	3,129.66	10.30 N	8.30 W	504,524.70	726,513.00	0.20	11.09	-26.53	
3,132.00	1.15	47.09	3,131.66	10.33 N	8.28 W	504,524.73	726,513.02	0.20	11.11	-26.44	
3,134.00	1.15	47.00	3,133.66	10.36 N	8.25 W	504,524.76	726,513.05	0.20	11.14	-26.35	
3,136.00	1.15	46.91	3,135.66	10.38 N	8.22 W	504,524.78	726,513.08	0.20	11.16	-26.26	
3,138.00	1.16	46.82	3,137.66	10.41 N	8.19 W	504,524.81	726,513.11	0.20	11.19	-26.17	
3,140.00	1.16	46.73	3,139.66	10.44 N	8.16 W	504,524.84	726,513.14	0.20	11.21	-26.08	
3,142.00	1.17	46.65	3,141.66	10.47 N	8.13 W	504,524.87	726,513.17	0.20	11.24	-25.99	
3,144.00	1.17	46.56	3,143.66	10.50 N	8.10 W	504,524.90	726,513.20	0.20	11.26	-25.91	
3,146.00	1.17	46.48	3,145.66	10.52 N	8.07 W	504,524.92	726,513.23	0.20	11.29	-25.82	

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				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
3,148.00	1.18	46.39	3,147.66	10.55 N	8.04 W	504,524.95	726,513.26	0.20	11.31	-25.74	
3,150.00	1.18	46.31	3,149.66	10.58 N	8.01 W	504,524.98	726,513.29	0.20	11.34	-25.65	
3,152.00	1.18	46.22	3,151.66	10.61 N	7.98 W	504,525.01	726,513.32	0.20	11.36	-25.57	
3,154.00	1.19	46.14	3,153.66	10.64 N	7.95 W	504,525.04	726,513.35	0.20	11.39	-25.48	
3,156.00	1.19	46.06	3,155.66	10.67 N	7.92 W	504,525.07	726,513.38	0.20	11.41	-25.40	
3,158.00	1.19	45.97	3,157.66	10.69 N	7.89 W	504,525.09	726,513.41	0.20	11.44	-25.31	
3,160.00	1.20	45.89	3,159.66	10.72 N	7.86 W	504,525.12	726,513.44	0.20	11.46	-25.23	
3,162.00	1.20	45.85	3,161.66	10.75 N	7.83 W	504,525.15	726,513.47	0.10	11.49	-25.15	
3,164.00	1.20	45.85	3,163.66	10.78 N	7.80 W	504,525.18	726,513.50	0.00	11.52	0.00	
3,166.00	1.20	45.85	3,165.66	10.81 N	7.77 W	504,525.21	726,513.53	0.00	11.54	0.00	
3,168.00	1.20	45.85	3,167.65	10.84 N	7.74 W	504,525.24	726,513.56	0.00	11.57	0.00	
3,170.00	1.20	45.85	3,169.65	10.87 N	7.71 W	504,525.27	726,513.59	0.00	11.59	0.00	
3,172.00	1.20	45.85	3,171.65	10.90 N	7.68 W	504,525.30	726,513.62	0.00	11.62	0.00	
3,174.00	1.20	45.85	3,173.65	10.93 N	7.65 W	504,525.33	726,513.65	0.00	11.65	0.00	
3,176.00	1.20	45.85	3,175.65	10.96 N	7.62 W	504,525.36	726,513.68	0.00	11.67	0.00	
3,178.00	1.20	45.85	3,177.65	10.99 N	7.59 W	504,525.39	726,513.71	0.00	11.70	0.00	
3,180.00	1.20	45.85	3,179.65	11.01 N	7.56 W	504,525.41	726,513.74	0.00	11.72	0.00	
3,182.00	1.19	45.83	3,181.65	11.04 N	7.53 W	504,525.44	726,513.77	0.28	11.75	-176.55	
3,184.00	1.19	45.83	3,183.65	11.07 N	7.50 W	504,525.47	726,513.80	0.03	11.78	-176.54	
3,186.00	1.19	45.83	3,185.65	11.10 N	7.47 W	504,525.50	726,513.83	0.03	11.80	-176.54	
3,188.00	1.19	45.83	3,187.65	11.13 N	7.44 W	504,525.53	726,513.86	0.03	11.83	-176.54	
3,190.00	1.19	45.83	3,189.65	11.16 N	7.41 W	504,525.56	726,513.89	0.03	11.85	-176.53	
3,192.00	1.19	45.83	3,191.65	11.19 N	7.38 W	504,525.59	726,513.92	0.03	11.88	-176.53	
3,194.00	1.19	45.82	3,193.65	11.22 N	7.35 W	504,525.62	726,513.95	0.03	11.90	-176.53	
3,196.00	1.19	45.82	3,195.65	11.25 N	7.32 W	504,525.65	726,513.98	0.03	11.93	-176.53	
3,198.00	1.19	45.82	3,197.65	11.28 N	7.29 W	504,525.68	726,514.01	0.03	11.96	-176.53	
3,200.00	1.19	45.82	3,199.65	11.30 N	7.26 W	504,525.70	726,514.04	0.03	11.98	-176.53	
3,202.00	1.19	45.82	3,201.65	11.33 N	7.23 W	504,525.73	726,514.07	0.03	12.01	-176.52	
3,204.00	1.19	45.82	3,203.65	11.36 N	7.20 W	504,525.76	726,514.10	0.03	12.03	-176.52	
3,206.00	1.19	45.82	3,205.65	11.39 N	7.17 W	504,525.79	726,514.13	0.03	12.06	-176.52	
3,208.00	1.19	45.81	3,207.65	11.42 N	7.14 W	504,525.82	726,514.16	0.03	12.09	-176.52	
3,210.00	1.19	45.81	3,209.65	11.45 N	7.11 W	504,525.85	726,514.19	0.03	12.11	-176.52	
3,212.00	1.19	45.81	3,211.65	11.48 N	7.08 W	504,525.88	726,514.22	0.03	12.14	-176.52	
3,214.00	1.19	45.81	3,213.64	11.51 N	7.05 W	504,525.91	726,514.25	0.03	12.16	-176.52	
3,216.00	1.19	45.81	3,215.64	11.54 N	7.02 W	504,525.94	726,514.28	0.03	12.19	-176.51	
3,218.00	1.18	45.81	3,217.64	11.56 N	6.99 W	504,525.96	726,514.31	0.03	12.21	-176.51	
3,220.00	1.18	45.80	3,219.64	11.59 N	6.96 W	504,525.99	726,514.34	0.03	12.24	-176.51	

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Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
3,222.00	1.18	45.80	3,221.64	11.62 N	6.93 W	504,526.02	726,514.37	0.03	12.26	-176.51	
3,224.00	1.18	45.80	3,223.64	11.65 N	6.91 W	504,526.05	726,514.39	0.03	12.29	-176.51	
3,226.00	1.18	45.80	3,225.64	11.68 N	6.88 W	504,526.08	726,514.42	0.03	12.32	-176.51	
3,228.00	1.18	45.80	3,227.64	11.71 N	6.85 W	504,526.11	726,514.45	0.03	12.34	-176.50	
3,230.00	1.18	45.80	3,229.64	11.74 N	6.82 W	504,526.14	726,514.48	0.03	12.37	-176.50	
3,232.00	1.18	45.80	3,231.64	11.77 N	6.79 W	504,526.17	726,514.51	0.03	12.39	-176.50	
3,234.00	1.18	45.79	3,233.64	11.80 N	6.76 W	504,526.20	726,514.54	0.03	12.42	-176.50	
3,236.00	1.18	45.79	3,235.64	11.82 N	6.73 W	504,526.22	726,514.57	0.03	12.44	-176.50	
3,238.00	1.18	45.79	3,237.64	11.85 N	6.70 W	504,526.25	726,514.60	0.03	12.47	-176.50	
3,240.00	1.18	45.79	3,239.64	11.88 N	6.67 W	504,526.28	726,514.63	0.03	12.50	-176.50	
3,242.00	1.18	45.79	3,241.64	11.91 N	6.64 W	504,526.31	726,514.66	0.03	12.52	-176.49	
3,244.00	1.18	45.79	3,243.64	11.94 N	6.61 W	504,526.34	726,514.69	0.03	12.55	-176.49	
3,246.00	1.18	45.78	3,245.64	11.97 N	6.58 W	504,526.37	726,514.72	0.03	12.57	-176.49	
3,248.00	1.18	45.78	3,247.64	12.00 N	6.55 W	504,526.40	726,514.75	0.03	12.60	-176.49	
3,250.00	1.18	45.78	3,249.64	12.02 N	6.52 W	504,526.42	726,514.78	0.03	12.62	-176.49	
3,252.00	1.18	45.78	3,251.64	12.05 N	6.49 W	504,526.45	726,514.81	0.03	12.65	-176.49	
3,254.00	1.18	45.78	3,253.64	12.08 N	6.46 W	504,526.48	726,514.84	0.03	12.67	-176.48	
3,256.00	1.17	45.78	3,255.64	12.11 N	6.43 W	504,526.51	726,514.87	0.03	12.70	-176.48	
3,258.00	1.17	45.77	3,257.64	12.14 N	6.40 W	504,526.54	726,514.90	0.03	12.73	-176.48	
3,260.00	1.17	45.77	3,259.64	12.17 N	6.37 W	504,526.57	726,514.93	0.03	12.75	-176.48	
3,262.00	1.17	45.77	3,261.63	12.20 N	6.35 W	504,526.60	726,514.95	0.03	12.78	-176.48	
3,264.00	1.17	45.77	3,263.63	12.22 N	6.32 W	504,526.62	726,514.98	0.03	12.80	-176.48	
3,266.00	1.17	45.77	3,265.63	12.25 N	6.29 W	504,526.65	726,515.01	0.03	12.83	-176.47	
3,268.00	1.17	45.77	3,267.63	12.28 N	6.26 W	504,526.68	726,515.04	0.03	12.85	-176.47	
3,270.00	1.17	45.77	3,269.63	12.31 N	6.23 W	504,526.71	726,515.07	0.03	12.88	-176.47	
3,272.00	1.17	45.76	3,271.63	12.34 N	6.20 W	504,526.74	726,515.10	0.03	12.90	-176.47	
3,274.00	1.17	45.76	3,273.63	12.37 N	6.17 W	504,526.77	726,515.13	0.03	12.93	-176.47	
3,276.00	1.17	45.76	3,275.63	12.40 N	6.14 W	504,526.80	726,515.16	0.03	12.95	-176.47	
3,278.00	1.17	45.76	3,277.63	12.42 N	6.11 W	504,526.82	726,515.19	0.03	12.98	-176.46	
3,280.00	1.17	45.76	3,279.63	12.45 N	6.08 W	504,526.85	726,515.22	0.03	13.00	-176.46	
3,282.00	1.17	45.76	3,281.63	12.48 N	6.05 W	504,526.88	726,515.25	0.03	13.03	-176.46	
3,284.00	1.17	45.75	3,283.63	12.51 N	6.02 W	504,526.91	726,515.28	0.03	13.06	-176.46	
3,286.00	1.17	45.75	3,285.63	12.54 N	5.99 W	504,526.94	726,515.31	0.03	13.08	-176.46	
3,288.00	1.17	45.75	3,287.63	12.57 N	5.96 W	504,526.97	726,515.34	0.03	13.11	-176.46	
3,290.00	1.17	45.75	3,289.63	12.59 N	5.94 W	504,526.99	726,515.36	0.03	13.13	-176.46	
3,292.00	1.17	45.75	3,291.63	12.62 N	5.91 W	504,527.02	726,515.39	0.03	13.16	-176.45	
3,294.00	1.16	45.75	3,293.63	12.65 N	5.88 W	504,527.05	726,515.42	0.03	13.18	-176.45	

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Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
3,296.00	1.16	45.74	3,295.63	12.68 N	5.85 W	504,527.08	726,515.45	0.03	13.21	-176.45	
3,298.00	1.16	45.74	3,297.63	12.71 N	5.82 W	504,527.11	726,515.48	0.03	13.23	-176.45	
3,300.00	1.16	45.74	3,299.63	12.74 N	5.79 W	504,527.14	726,515.51	0.03	13.26	-176.45	
3,302.00	1.16	45.74	3,301.63	12.77 N	5.76 W	504,527.17	726,515.54	0.03	13.28	-176.45	
3,304.00	1.16	45.74	3,303.63	12.79 N	5.73 W	504,527.19	726,515.57	0.03	13.31	-176.44	
3,306.00	1.16	45.74	3,305.63	12.82 N	5.70 W	504,527.22	726,515.60	0.03	13.33	-176.44	
3,308.00	1.16	45.73	3,307.63	12.85 N	5.67 W	504,527.25	726,515.63	0.03	13.36	-176.44	
3,310.00	1.16	45.73	3,309.62	12.88 N	5.64 W	504,527.28	726,515.66	0.03	13.38	-176.44	
3,312.00	1.16	45.73	3,311.62	12.91 N	5.62 W	504,527.31	726,515.68	0.03	13.41	-176.44	
3,314.00	1.16	45.73	3,313.62	12.93 N	5.59 W	504,527.33	726,515.71	0.03	13.43	-176.44	
3,316.00	1.16	45.73	3,315.62	12.96 N	5.56 W	504,527.36	726,515.74	0.03	13.46	-176.43	
3,318.00	1.16	45.73	3,317.62	12.99 N	5.53 W	504,527.39	726,515.77	0.03	13.48	-176.43	
3,320.00	1.16	45.72	3,319.62	13.02 N	5.50 W	504,527.42	726,515.80	0.03	13.51	-176.43	
3,322.00	1.16	45.72	3,321.62	13.05 N	5.47 W	504,527.45	726,515.83	0.03	13.53	-176.43	
3,324.00	1.16	45.72	3,323.62	13.08 N	5.44 W	504,527.48	726,515.86	0.03	13.56	-176.43	
3,326.00	1.16	45.72	3,325.62	13.10 N	5.41 W	504,527.50	726,515.89	0.03	13.58	-176.43	
3,328.00	1.16	45.72	3,327.62	13.13 N	5.38 W	504,527.53	726,515.92	0.03	13.61	-176.42	
3,330.00	1.16	45.72	3,329.62	13.16 N	5.36 W	504,527.56	726,515.94	0.03	13.64	-176.42	
3,332.00	1.15	45.71	3,331.62	13.19 N	5.33 W	504,527.59	726,515.97	0.03	13.66	-176.42	
3,334.00	1.15	45.71	3,333.62	13.22 N	5.30 W	504,527.62	726,516.00	0.03	13.69	-176.42	
3,336.00	1.15	45.71	3,335.62	13.24 N	5.27 W	504,527.64	726,516.03	0.03	13.71	-176.42	
3,338.00	1.15	45.71	3,337.62	13.27 N	5.24 W	504,527.67	726,516.06	0.03	13.74	-176.42	
3,340.00	1.15	45.71	3,339.62	13.30 N	5.21 W	504,527.70	726,516.09	0.03	13.76	-176.41	
3,342.00	1.15	45.71	3,341.62	13.33 N	5.18 W	504,527.73	726,516.12	0.03	13.79	-176.41	
3,344.00	1.15	45.70	3,343.62	13.36 N	5.15 W	504,527.76	726,516.15	0.03	13.81	-176.41	
3,346.00	1.15	45.70	3,345.62	13.39 N	5.13 W	504,527.79	726,516.17	0.03	13.84	-176.41	
3,348.00	1.15	45.70	3,347.62	13.41 N	5.10 W	504,527.81	726,516.20	0.03	13.86	-176.41	
3,350.00	1.15	45.70	3,349.62	13.44 N	5.07 W	504,527.84	726,516.23	0.03	13.89	-176.41	
3,352.00	1.15	45.70	3,351.62	13.47 N	5.04 W	504,527.87	726,516.26	0.00	13.91	-0.01	
3,354.00	1.15	46.16	3,353.62	13.50 N	5.01 W	504,527.90	726,516.29	0.47	13.94	101.22	
3,356.00	1.15	46.39	3,355.62	13.52 N	4.98 W	504,527.92	726,516.32	0.24	13.96	100.76	
3,358.00	1.15	46.62	3,357.61	13.55 N	4.95 W	504,527.95	726,516.35	0.24	13.98	100.53	
3,360.00	1.15	46.86	3,359.61	13.58 N	4.92 W	504,527.98	726,516.38	0.24	14.01	100.30	
3,362.00	1.14	47.09	3,361.61	13.61 N	4.89 W	504,528.01	726,516.41	0.24	14.03	100.07	
3,364.00	1.14	47.32	3,363.61	13.63 N	4.86 W	504,528.03	726,516.44	0.24	14.06	99.83	
3,366.00	1.14	47.55	3,365.61	13.66 N	4.83 W	504,528.06	726,516.47	0.24	14.08	99.60	

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				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
3,368.00	1.14	47.79	3,367.61	13.69 N	4.81 W	504,528.09	726,516.49	0.24	14.10	99.37	
3,370.00	1.14	48.02	3,369.61	13.71 N	4.78 W	504,528.11	726,516.52	0.24	14.13	99.14	
3,372.00	1.14	48.25	3,371.61	13.74 N	4.75 W	504,528.14	726,516.55	0.24	14.15	98.90	
3,374.00	1.14	48.49	3,373.61	13.77 N	4.72 W	504,528.17	726,516.58	0.24	14.17	98.67	
3,376.00	1.14	48.72	3,375.61	13.79 N	4.69 W	504,528.19	726,516.61	0.24	14.20	98.44	
3,378.00	1.14	48.96	3,377.61	13.82 N	4.66 W	504,528.22	726,516.64	0.24	14.22	98.20	
3,380.00	1.14	49.19	3,379.61	13.85 N	4.63 W	504,528.25	726,516.67	0.24	14.24	97.97	
3,382.00	1.14	49.43	3,381.61	13.87 N	4.60 W	504,528.27	726,516.70	0.24	14.27	97.73	
3,384.00	1.14	49.66	3,383.61	13.90 N	4.57 W	504,528.30	726,516.73	0.24	14.29	97.50	
3,386.00	1.14	49.90	3,385.61	13.92 N	4.54 W	504,528.32	726,516.76	0.24	14.31	97.26	
3,388.00	1.14	50.13	3,387.61	13.95 N	4.51 W	504,528.35	726,516.79	0.24	14.33	97.03	
3,390.00	1.14	50.37	3,389.61	13.97 N	4.48 W	504,528.37	726,516.82	0.24	14.36	96.79	
3,392.00	1.13	50.61	3,391.61	14.00 N	4.44 W	504,528.40	726,516.86	0.24	14.38	96.55	
3,394.00	1.13	50.84	3,393.61	14.02 N	4.41 W	504,528.42	726,516.89	0.24	14.40	96.32	
3,396.00	1.13	51.08	3,395.61	14.05 N	4.38 W	504,528.45	726,516.92	0.24	14.42	96.08	
3,398.00	1.13	51.32	3,397.61	14.07 N	4.35 W	504,528.47	726,516.95	0.24	14.44	95.84	
3,400.00	1.13	51.55	3,399.61	14.10 N	4.32 W	504,528.50	726,516.98	0.24	14.46	95.61	
3,402.00	1.13	51.79	3,401.61	14.12 N	4.29 W	504,528.52	726,517.01	0.24	14.49	95.37	
3,404.00	1.13	52.03	3,403.61	14.15 N	4.26 W	504,528.55	726,517.04	0.24	14.51	95.13	
3,406.00	1.13	52.27	3,405.61	14.17 N	4.23 W	504,528.57	726,517.07	0.24	14.53	94.89	
3,408.00	1.13	52.51	3,407.61	14.20 N	4.20 W	504,528.60	726,517.10	0.24	14.55	94.66	
3,410.00	1.13	52.74	3,409.60	14.22 N	4.17 W	504,528.62	726,517.13	0.24	14.57	94.42	
3,412.00	1.13	52.98	3,411.60	14.24 N	4.13 W	504,528.64	726,517.17	0.24	14.59	94.18	
3,414.00	1.13	53.22	3,413.60	14.27 N	4.10 W	504,528.67	726,517.20	0.24	14.61	93.94	
3,416.00	1.13	53.46	3,415.60	14.29 N	4.07 W	504,528.69	726,517.23	0.24	14.63	93.70	
3,418.00	1.13	53.70	3,417.60	14.31 N	4.04 W	504,528.71	726,517.26	0.24	14.65	93.47	
3,420.00	1.13	53.94	3,419.60	14.34 N	4.01 W	504,528.74	726,517.29	0.24	14.67	93.23	
3,422.00	1.13	54.17	3,421.60	14.36 N	3.98 W	504,528.76	726,517.32	0.24	14.69	92.99	
3,424.00	1.13	54.41	3,423.60	14.38 N	3.94 W	504,528.78	726,517.36	0.24	14.71	92.75	
3,426.00	1.13	54.65	3,425.60	14.41 N	3.91 W	504,528.81	726,517.39	0.24	14.73	92.51	
3,428.00	1.13	54.89	3,427.60	14.43 N	3.88 W	504,528.83	726,517.42	0.24	14.75	92.27	
3,430.00	1.13	55.13	3,429.60	14.45 N	3.85 W	504,528.85	726,517.45	0.24	14.77	92.03	
3,432.00	1.13	55.37	3,431.60	14.47 N	3.81 W	504,528.87	726,517.49	0.24	14.79	91.79	
3,434.00	1.13	55.61	3,433.60	14.50 N	3.78 W	504,528.90	726,517.52	0.24	14.81	91.56	
3,436.00	1.13	55.85	3,435.60	14.52 N	3.75 W	504,528.92	726,517.55	0.24	14.82	91.32	
3,438.00	1.13	56.09	3,437.60	14.54 N	3.72 W	504,528.94	726,517.58	0.24	14.84	91.08	
3,440.00	1.13	56.33	3,439.60	14.56 N	3.68 W	504,528.96	726,517.62	0.24	14.86	90.84	



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				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
3,442.00	1.13	56.57	3,441.60	14.59 N	3.65 W	504,528.99	726,517.65	0.24	14.88	90.60	
3,444.00	1.13	56.81	3,443.60	14.61 N	3.62 W	504,529.01	726,517.68	0.24	14.90	90.36	
3,446.00	1.13	57.04	3,445.60	14.63 N	3.59 W	504,529.03	726,517.71	0.24	14.92	90.12	
3,448.00	1.13	57.28	3,447.60	14.65 N	3.55 W	504,529.05	726,517.75	0.24	14.93	89.88	
3,450.00	1.13	57.52	3,449.60	14.67 N	3.52 W	504,529.07	726,517.78	0.24	14.95	89.64	
3,452.00	1.13	57.76	3,451.60	14.69 N	3.49 W	504,529.09	726,517.81	0.24	14.97	89.40	
3,454.00	1.13	58.00	3,453.60	14.71 N	3.45 W	504,529.11	726,517.85	0.24	14.99	89.16	
3,456.00	1.13	58.24	3,455.60	14.73 N	3.42 W	504,529.13	726,517.88	0.24	15.00	88.92	
3,458.00	1.13	58.48	3,457.60	14.75 N	3.39 W	504,529.15	726,517.91	0.24	15.02	88.68	
3,460.00	1.13	58.72	3,459.59	14.77 N	3.35 W	504,529.17	726,517.95	0.24	15.04	88.44	
3,462.00	1.13	58.96	3,461.59	14.80 N	3.32 W	504,529.20	726,517.98	0.24	15.06	88.21	
3,464.00	1.13	59.20	3,463.59	14.82 N	3.28 W	504,529.22	726,518.02	0.24	15.07	87.97	
3,466.00	1.13	59.44	3,465.59	14.84 N	3.25 W	504,529.24	726,518.05	0.24	15.09	87.73	
3,468.00	1.13	59.68	3,467.59	14.86 N	3.22 W	504,529.26	726,518.08	0.24	15.10	87.49	
3,470.00	1.13	59.91	3,469.59	14.88 N	3.18 W	504,529.28	726,518.12	0.24	15.12	87.25	
3,472.00	1.13	60.15	3,471.59	14.90 N	3.15 W	504,529.30	726,518.15	0.24	15.14	87.01	
3,474.00	1.13	60.39	3,473.59	14.91 N	3.11 W	504,529.31	726,518.19	0.24	15.15	86.77	
3,476.00	1.13	60.63	3,475.59	14.93 N	3.08 W	504,529.33	726,518.22	0.24	15.17	86.53	
3,478.00	1.13	60.87	3,477.59	14.95 N	3.05 W	504,529.35	726,518.25	0.24	15.18	86.30	
3,480.00	1.13	61.11	3,479.59	14.97 N	3.01 W	504,529.37	726,518.29	0.24	15.20	86.06	
3,482.00	1.13	61.34	3,481.59	14.99 N	2.98 W	504,529.39	726,518.32	0.24	15.22	85.82	
3,484.00	1.13	61.58	3,483.59	15.01 N	2.94 W	504,529.41	726,518.36	0.24	15.23	85.58	
3,486.00	1.13	61.82	3,485.59	15.03 N	2.91 W	504,529.43	726,518.39	0.24	15.25	85.34	
3,488.00	1.13	62.06	3,487.59	15.05 N	2.87 W	504,529.45	726,518.43	0.24	15.26	85.11	
3,490.00	1.13	62.30	3,489.59	15.07 N	2.84 W	504,529.47	726,518.46	0.24	15.28	84.87	
3,492.00	1.13	62.53	3,491.59	15.08 N	2.80 W	504,529.48	726,518.50	0.24	15.29	84.63	
3,494.00	1.13	62.77	3,493.59	15.10 N	2.77 W	504,529.50	726,518.53	0.24	15.31	84.39	
3,496.00	1.13	63.01	3,495.59	15.12 N	2.73 W	504,529.52	726,518.57	0.24	15.32	84.16	
3,498.00	1.13	63.24	3,497.59	15.14 N	2.70 W	504,529.54	726,518.60	0.24	15.33	83.92	
3,500.00	1.14	63.48	3,499.59	15.16 N	2.66 W	504,529.56	726,518.64	0.24	15.35	83.68	
3,502.00	1.14	63.72	3,501.59	15.17 N	2.62 W	504,529.57	726,518.68	0.24	15.36	83.45	
3,504.00	1.14	63.95	3,503.59	15.19 N	2.59 W	504,529.59	726,518.71	0.24	15.38	83.21	
3,506.00	1.14	64.19	3,505.59	15.21 N	2.55 W	504,529.61	726,518.75	0.24	15.39	82.97	
3,508.00	1.14	64.42	3,507.59	15.23 N	2.52 W	504,529.63	726,518.78	0.24	15.40	82.74	
3,510.00	1.14	64.66	3,509.59	15.24 N	2.48 W	504,529.64	726,518.82	0.24	15.42	82.50	
3,512.00	1.14	64.89	3,511.58	15.26 N	2.45 W	504,529.66	726,518.85	0.24	15.43	82.27	
3,514.00	1.14	65.13	3,513.58	15.28 N	2.41 W	504,529.68	726,518.89	0.24	15.44	82.03	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
3,516.00	1.14	65.36	3,515.58	15.29 N	2.37 W	504,529.69	726,518.93	0.24	15.46	81.80	
3,518.00	1.14	65.60	3,517.58	15.31 N	2.34 W	504,529.71	726,518.96	0.24	15.47	81.56	
3,520.00	1.14	65.83	3,519.58	15.33 N	2.30 W	504,529.73	726,519.00	0.24	15.48	81.33	
3,522.00	1.14	66.06	3,521.58	15.34 N	2.27 W	504,529.74	726,519.03	0.24	15.49	81.10	
3,524.00	1.14	66.30	3,523.58	15.36 N	2.23 W	504,529.76	726,519.07	0.24	15.51	80.86	
3,526.00	1.14	66.53	3,525.58	15.37 N	2.19 W	504,529.77	726,519.11	0.24	15.52	80.63	
3,528.00	1.14	66.76	3,527.58	15.39 N	2.16 W	504,529.79	726,519.14	0.24	15.53	80.40	
3,530.00	1.15	66.99	3,529.58	15.41 N	2.12 W	504,529.81	726,519.18	0.24	15.54	80.17	
3,532.00	1.15	67.23	3,531.58	15.42 N	2.08 W	504,529.82	726,519.22	0.24	15.55	79.93	
3,534.00	1.15	67.46	3,533.58	15.44 N	2.04 W	504,529.84	726,519.26	0.24	15.56	79.70	
3,536.00	1.15	67.69	3,535.58	15.45 N	2.01 W	504,529.85	726,519.29	0.24	15.58	79.47	
3,538.00	1.15	67.92	3,537.58	15.47 N	1.97 W	504,529.87	726,519.33	0.24	15.59	79.24	
3,540.00	1.15	68.15	3,539.58	15.48 N	1.93 W	504,529.88	726,519.37	0.24	15.60	79.01	
3,542.00	1.14	68.75	3,541.58	15.50 N	1.90 W	504,529.90	726,519.40	0.66	15.61	114.26	
3,544.00	1.14	69.36	3,543.58	15.51 N	1.86 W	504,529.91	726,519.44	0.66	15.62	113.66	
3,546.00	1.13	69.98	3,545.58	15.53 N	1.82 W	504,529.93	726,519.48	0.66	15.63	113.05	
3,548.00	1.13	70.60	3,547.58	15.54 N	1.78 W	504,529.94	726,519.52	0.66	15.64	112.43	
3,550.00	1.12	71.23	3,549.58	15.55 N	1.75 W	504,529.95	726,519.55	0.66	15.65	111.81	
3,552.00	1.12	71.86	3,551.58	15.56 N	1.71 W	504,529.96	726,519.59	0.66	15.66	111.19	
3,554.00	1.12	72.50	3,553.58	15.58 N	1.67 W	504,529.98	726,519.63	0.66	15.67	110.55	
3,556.00	1.11	73.14	3,555.58	15.59 N	1.64 W	504,529.99	726,519.66	0.66	15.67	109.92	
3,558.00	1.11	73.79	3,557.58	15.60 N	1.60 W	504,530.00	726,519.70	0.66	15.68	109.28	
3,560.00	1.10	74.44	3,559.58	15.61 N	1.56 W	504,530.01	726,519.74	0.66	15.69	108.63	
3,562.00	1.10	75.10	3,561.57	15.62 N	1.52 W	504,530.02	726,519.78	0.66	15.69	107.98	
3,564.00	1.09	75.76	3,563.57	15.63 N	1.49 W	504,530.03	726,519.81	0.66	15.70	107.32	
3,566.00	1.09	76.42	3,565.57	15.64 N	1.45 W	504,530.04	726,519.85	0.66	15.70	106.66	
3,568.00	1.09	77.09	3,567.57	15.65 N	1.41 W	504,530.05	726,519.89	0.66	15.71	105.99	
3,570.00	1.08	77.77	3,569.57	15.65 N	1.38 W	504,530.05	726,519.92	0.66	15.71	105.32	
3,572.00	1.08	78.45	3,571.57	15.66 N	1.34 W	504,530.06	726,519.96	0.66	15.72	104.64	
3,574.00	1.08	79.13	3,573.57	15.67 N	1.30 W	504,530.07	726,520.00	0.66	15.72	103.97	
3,576.00	1.07	79.82	3,575.57	15.68 N	1.27 W	504,530.08	726,520.03	0.66	15.72	103.28	
3,578.00	1.07	80.51	3,577.57	15.68 N	1.23 W	504,530.08	726,520.07	0.66	15.73	102.59	
3,580.00	1.07	81.21	3,579.57	15.69 N	1.19 W	504,530.09	726,520.11	0.66	15.73	101.90	
3,582.00	1.07	81.90	3,581.57	15.69 N	1.16 W	504,530.09	726,520.14	0.66	15.73	101.21	
3,584.00	1.06	82.61	3,583.57	15.70 N	1.12 W	504,530.10	726,520.18	0.66	15.73	100.51	
3,586.00	1.06	83.31	3,585.57	15.70 N	1.08 W	504,530.10	726,520.22	0.66	15.73	99.81	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
3,588.00	1.06	84.02	3,587.57	15.71 N	1.04 W	504,530.11	726,520.26	0.66	15.73	99.11	
3,590.00	1.06	84.73	3,589.57	15.71 N	1.01 W	504,530.11	726,520.29	0.66	15.73	98.40	
3,592.00	1.06	85.44	3,591.57	15.71 N	0.97 W	504,530.11	726,520.33	0.66	15.73	97.69	
3,594.00	1.05	86.15	3,593.57	15.72 N	0.93 W	504,530.12	726,520.37	0.66	15.73	96.98	
3,596.00	1.05	86.87	3,595.57	15.72 N	0.90 W	504,530.12	726,520.40	0.66	15.73	96.26	
3,598.00	1.05	87.59	3,597.57	15.72 N	0.86 W	504,530.12	726,520.44	0.66	15.73	95.55	
3,600.00	1.05	88.30	3,599.57	15.72 N	0.82 W	504,530.12	726,520.48	0.66	15.73	94.83	
3,602.00	1.05	89.03	3,601.57	15.72 N	0.79 W	504,530.12	726,520.51	0.66	15.72	94.11	
3,604.00	1.05	89.75	3,603.57	15.72 N	0.75 W	504,530.12	726,520.55	0.66	15.72	93.39	
3,606.00	1.05	90.47	3,605.57	15.72 N	0.71 W	504,530.12	726,520.59	0.66	15.72	92.67	
3,608.00	1.05	91.19	3,607.57	15.72 N	0.68 W	504,530.12	726,520.62	0.66	15.71	91.95	
3,610.00	1.05	91.92	3,609.57	15.72 N	0.64 W	504,530.12	726,520.66	0.66	15.71	91.22	
3,612.00	1.05	92.64	3,611.57	15.72 N	0.60 W	504,530.12	726,520.70	0.66	15.70	90.50	
3,614.00	1.05	93.36	3,613.57	15.72 N	0.57 W	504,530.12	726,520.73	0.66	15.70	89.78	
3,616.00	1.05	94.09	3,615.57	15.72 N	0.53 W	504,530.12	726,520.77	0.66	15.69	89.05	
3,618.00	1.05	94.81	3,617.57	15.71 N	0.50 W	504,530.11	726,520.80	0.66	15.68	88.33	
3,620.00	1.05	95.53	3,619.56	15.71 N	0.46 W	504,530.11	726,520.84	0.66	15.68	87.61	
3,622.00	1.05	96.25	3,621.56	15.71 N	0.42 W	504,530.11	726,520.88	0.66	15.67	86.89	
3,624.00	1.05	96.97	3,623.56	15.70 N	0.39 W	504,530.10	726,520.91	0.66	15.66	86.17	
3,626.00	1.05	97.69	3,625.56	15.70 N	0.35 W	504,530.10	726,520.95	0.66	15.65	85.45	
3,628.00	1.05	98.41	3,627.56	15.69 N	0.31 W	504,530.09	726,520.99	0.66	15.64	84.73	
3,630.00	1.06	99.12	3,629.56	15.69 N	0.28 W	504,530.09	726,521.02	0.66	15.63	84.01	
3,632.00	1.06	99.84	3,631.56	15.68 N	0.24 W	504,530.08	726,521.06	0.66	15.62	83.30	
3,634.00	1.06	100.55	3,633.56	15.67 N	0.20 W	504,530.07	726,521.10	0.66	15.61	82.58	
3,636.00	1.06	101.26	3,635.56	15.67 N	0.17 W	504,530.07	726,521.13	0.72	15.60	66.92	
3,638.00	1.07	101.96	3,637.56	15.66 N	0.13 W	504,530.06	726,521.17	0.82	15.59	54.13	
3,640.00	1.08	102.66	3,639.56	15.65 N	0.09 W	504,530.05	726,521.21	0.82	15.58	53.43	
3,642.00	1.09	103.34	3,641.56	15.64 N	0.06 W	504,530.04	726,521.24	0.82	15.57	52.73	
3,644.00	1.10	104.00	3,643.56	15.63 N	0.02 W	504,530.03	726,521.28	0.82	15.56	52.05	
3,646.00	1.11	104.66	3,645.56	15.62 N	0.02 E	504,530.02	726,521.32	0.82	15.54	51.39	
3,648.00	1.12	105.30	3,647.56	15.61 N	0.06 E	504,530.01	726,521.36	0.82	15.53	50.73	
3,650.00	1.14	105.94	3,649.56	15.60 N	0.09 E	504,530.00	726,521.39	0.82	15.51	50.09	
3,652.00	1.15	106.56	3,651.56	15.59 N	0.13 E	504,529.99	726,521.43	0.82	15.50	49.45	
3,654.00	1.16	107.16	3,653.56	15.58 N	0.17 E	504,529.98	726,521.47	0.82	15.48	48.83	
3,656.00	1.17	107.76	3,655.56	15.57 N	0.21 E	504,529.97	726,521.51	0.82	15.47	48.23	
3,658.00	1.18	108.35	3,657.56	15.56 N	0.25 E	504,529.96	726,521.55	0.82	15.45	47.63	
3,660.00	1.19	108.92	3,659.56	15.54 N	0.29 E	504,529.94	726,521.59	0.82	15.43	47.04	



Eddy County, NM (NAD83)

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Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
3,662.00	1.20	109.49	3,661.56	15.53 N	0.33 E	504,529.93	726,521.63	0.82	15.42	46.47	
3,664.00	1.21	110.04	3,663.56	15.52 N	0.37 E	504,529.92	726,521.67	0.82	15.40	45.90	
3,666.00	1.22	110.58	3,665.56	15.50 N	0.41 E	504,529.90	726,521.71	0.82	15.38	45.35	
3,668.00	1.24	111.12	3,667.56	15.49 N	0.45 E	504,529.89	726,521.75	0.82	15.36	44.81	
3,670.00	1.25	111.64	3,669.56	15.47 N	0.49 E	504,529.87	726,521.79	0.82	15.34	44.27	
3,672.00	1.26	112.15	3,671.55	15.45 N	0.53 E	504,529.85	726,521.83	0.82	15.32	43.75	
3,674.00	1.27	112.66	3,673.55	15.44 N	0.57 E	504,529.84	726,521.87	0.82	15.30	43.24	
3,676.00	1.28	113.15	3,675.55	15.42 N	0.61 E	504,529.82	726,521.91	0.82	15.28	42.73	
3,678.00	1.30	113.64	3,677.55	15.40 N	0.65 E	504,529.80	726,521.95	0.82	15.26	42.24	
3,680.00	1.31	114.11	3,679.55	15.38 N	0.69 E	504,529.78	726,521.99	0.82	15.23	41.75	
3,682.00	1.32	114.58	3,681.55	15.36 N	0.73 E	504,529.76	726,522.03	0.82	15.21	41.28	
3,684.00	1.33	115.04	3,683.55	15.34 N	0.78 E	504,529.74	726,522.08	0.82	15.19	40.81	
3,686.00	1.35	115.49	3,685.55	15.32 N	0.82 E	504,529.72	726,522.12	0.82	15.16	40.35	
3,688.00	1.36	115.93	3,687.55	15.30 N	0.86 E	504,529.70	726,522.16	0.82	15.14	39.90	
3,690.00	1.37	116.37	3,689.55	15.28 N	0.90 E	504,529.68	726,522.20	0.82	15.11	39.46	
3,692.00	1.38	116.79	3,691.55	15.26 N	0.95 E	504,529.66	726,522.25	0.82	15.09	39.03	
3,694.00	1.40	117.21	3,693.55	15.24 N	0.99 E	504,529.64	726,522.29	0.82	15.06	38.60	
3,696.00	1.41	117.62	3,695.55	15.22 N	1.03 E	504,529.62	726,522.33	0.82	15.03	38.18	
3,698.00	1.42	118.02	3,697.55	15.19 N	1.08 E	504,529.59	726,522.38	0.82	15.01	37.77	
3,700.00	1.43	118.42	3,699.55	15.17 N	1.12 E	504,529.57	726,522.42	0.82	14.98	37.37	
3,702.00	1.45	118.81	3,701.55	15.15 N	1.16 E	504,529.55	726,522.46	0.82	14.95	36.97	
3,704.00	1.46	119.19	3,703.55	15.12 N	1.21 E	504,529.52	726,522.51	0.82	14.92	36.58	
3,706.00	1.47	119.56	3,705.55	15.10 N	1.25 E	504,529.50	726,522.55	0.82	14.89	36.20	
3,708.00	1.49	119.93	3,707.54	15.07 N	1.30 E	504,529.47	726,522.60	0.82	14.86	35.83	
3,710.00	1.50	120.29	3,709.54	15.04 N	1.34 E	504,529.44	726,522.64	0.82	14.83	35.46	
3,712.00	1.51	120.65	3,711.54	15.02 N	1.39 E	504,529.42	726,522.69	0.82	14.80	35.10	
3,714.00	1.53	121.00	3,713.54	14.99 N	1.43 E	504,529.39	726,522.73	0.82	14.77	34.74	
3,716.00	1.54	121.34	3,715.54	14.96 N	1.48 E	504,529.36	726,522.78	0.82	14.74	34.40	
3,718.00	1.55	121.68	3,717.54	14.93 N	1.53 E	504,529.33	726,522.83	0.82	14.70	34.05	
3,720.00	1.57	122.01	3,719.54	14.91 N	1.57 E	504,529.31	726,522.87	0.82	14.67	33.72	
3,722.00	1.58	122.33	3,721.54	14.88 N	1.62 E	504,529.28	726,522.92	0.82	14.64	33.38	
3,724.00	1.60	122.65	3,723.54	14.85 N	1.67 E	504,529.25	726,522.97	0.82	14.60	33.06	
3,726.00	1.61	122.97	3,725.54	14.82 N	1.71 E	504,529.22	726,523.01	0.82	14.57	32.74	
3,728.00	1.62	123.28	3,727.54	14.79 N	1.76 E	504,529.19	726,523.06	0.82	14.53	32.43	
3,730.00	1.63	123.64	3,729.54	14.75 N	1.81 E	504,529.15	726,523.11	0.55	14.50	69.91	
3,732.00	1.62	124.07	3,731.54	14.72 N	1.85 E	504,529.12	726,523.15	0.68	14.46	117.29	
3,734.00	1.61	124.49	3,733.53	14.69 N	1.90 E	504,529.09	726,523.20	0.68	14.42	116.87	

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				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
3,736.00	1.61	124.92	3,735.53	14.66 N	1.95 E	504,529.06	726,523.25	0.68	14.39	116.44	
3,738.00	1.60	125.36	3,737.53	14.63 N	1.99 E	504,529.03	726,523.29	0.68	14.35	116.01	
3,740.00	1.60	125.80	3,739.53	14.59 N	2.04 E	504,528.99	726,523.34	0.68	14.31	115.58	
3,742.00	1.59	126.24	3,741.53	14.56 N	2.08 E	504,528.96	726,523.38	0.68	14.28	115.14	
3,744.00	1.59	126.68	3,743.53	14.53 N	2.13 E	504,528.93	726,523.43	0.68	14.24	114.70	
3,746.00	1.58	127.13	3,745.53	14.50 N	2.17 E	504,528.90	726,523.47	0.68	14.20	114.25	
3,748.00	1.57	127.58	3,747.53	14.46 N	2.22 E	504,528.86	726,523.52	0.68	14.16	113.81	
3,750.00	1.57	128.03	3,749.53	14.43 N	2.26 E	504,528.83	726,523.56	0.68	14.13	113.36	
3,752.00	1.56	128.49	3,751.53	14.39 N	2.30 E	504,528.79	726,523.60	0.68	14.09	112.91	
3,754.00	1.56	128.94	3,753.53	14.36 N	2.35 E	504,528.76	726,523.65	0.68	14.05	112.45	
3,756.00	1.55	129.41	3,755.53	14.33 N	2.39 E	504,528.73	726,523.69	0.68	14.01	111.99	
3,758.00	1.55	129.87	3,757.53	14.29 N	2.43 E	504,528.69	726,523.73	0.68	13.97	111.53	
3,760.00	1.54	130.34	3,759.52	14.26 N	2.47 E	504,528.66	726,523.77	0.68	13.93	111.06	
3,762.00	1.54	130.81	3,761.52	14.22 N	2.51 E	504,528.62	726,523.81	0.68	13.89	110.60	
3,764.00	1.54	131.28	3,763.52	14.19 N	2.55 E	504,528.59	726,523.85	0.68	13.86	110.13	
3,766.00	1.53	131.76	3,765.52	14.15 N	2.59 E	504,528.55	726,523.89	0.68	13.82	109.65	
3,768.00	1.53	132.24	3,767.52	14.12 N	2.63 E	504,528.52	726,523.93	0.68	13.78	109.18	
3,770.00	1.52	132.72	3,769.52	14.08 N	2.67 E	504,528.48	726,523.97	0.68	13.74	108.70	
3,772.00	1.52	133.21	3,771.52	14.04 N	2.71 E	504,528.44	726,524.01	0.68	13.70	108.22	
3,774.00	1.51	133.69	3,773.52	14.01 N	2.75 E	504,528.41	726,524.05	0.68	13.66	107.73	
3,776.00	1.51	134.18	3,775.52	13.97 N	2.79 E	504,528.37	726,524.09	0.68	13.62	107.24	
3,778.00	1.51	134.67	3,777.52	13.93 N	2.82 E	504,528.33	726,524.12	0.68	13.58	106.75	
3,780.00	1.50	135.17	3,779.52	13.90 N	2.86 E	504,528.30	726,524.16	0.68	13.54	106.26	
3,782.00	1.50	135.67	3,781.52	13.86 N	2.90 E	504,528.26	726,524.20	0.68	13.49	105.77	
3,784.00	1.50	136.17	3,783.52	13.82 N	2.93 E	504,528.22	726,524.23	0.68	13.45	105.27	
3,786.00	1.49	136.67	3,785.52	13.78 N	2.97 E	504,528.18	726,524.27	0.68	13.41	104.77	
3,788.00	1.49	137.17	3,787.52	13.75 N	3.01 E	504,528.15	726,524.31	0.68	13.37	104.27	
3,790.00	1.49	137.68	3,789.51	13.71 N	3.04 E	504,528.11	726,524.34	0.68	13.33	103.77	
3,792.00	1.48	138.19	3,791.51	13.67 N	3.07 E	504,528.07	726,524.37	0.68	13.29	103.26	
3,794.00	1.48	138.70	3,793.51	13.63 N	3.11 E	504,528.03	726,524.41	0.68	13.25	102.75	
3,796.00	1.48	139.21	3,795.51	13.59 N	3.14 E	504,527.99	726,524.44	0.68	13.20	102.24	
3,798.00	1.47	139.72	3,797.51	13.55 N	3.18 E	504,527.95	726,524.48	0.68	13.16	101.73	
3,800.00	1.47	140.24	3,799.51	13.51 N	3.21 E	504,527.91	726,524.51	0.68	13.12	101.21	
3,802.00	1.47	140.76	3,801.51	13.47 N	3.24 E	504,527.87	726,524.54	0.68	13.08	100.70	
3,804.00	1.47	141.28	3,803.51	13.43 N	3.27 E	504,527.83	726,524.57	0.68	13.03	100.18	
3,806.00	1.46	141.80	3,805.51	13.39 N	3.31 E	504,527.79	726,524.61	0.68	12.99	99.66	



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Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
3,808.00	1.46	142.32	3,807.51	13.35 N	3.34 E	504,527.75	726,524.64	0.68	12.95	99.14	
3,810.00	1.46	142.85	3,809.51	13.31 N	3.37 E	504,527.71	726,524.67	0.68	12.90	98.62	
3,812.00	1.46	143.37	3,811.51	13.27 N	3.40 E	504,527.67	726,524.70	0.68	12.86	98.09	
3,814.00	1.46	143.90	3,813.51	13.23 N	3.43 E	504,527.63	726,524.73	0.68	12.82	97.57	
3,816.00	1.46	144.43	3,815.51	13.19 N	3.46 E	504,527.59	726,524.76	0.68	12.77	97.04	
3,818.00	1.45	144.96	3,817.51	13.15 N	3.49 E	504,527.55	726,524.79	0.68	12.73	96.51	
3,820.00	1.45	145.49	3,819.50	13.11 N	3.52 E	504,527.51	726,524.82	0.68	12.68	95.98	
3,822.00	1.45	146.02	3,821.50	13.07 N	3.55 E	504,527.47	726,524.85	0.68	12.64	95.45	
3,824.00	1.45	146.55	3,823.50	13.02 N	3.57 E	504,527.42	726,524.87	0.68	12.59	94.92	
3,826.00	1.44	147.26	3,825.50	12.98 N	3.60 E	504,527.38	726,524.90	1.08	12.55	124.61	
3,828.00	1.43	147.98	3,827.50	12.94 N	3.63 E	504,527.34	726,524.93	1.08	12.50	123.90	
3,830.00	1.41	148.71	3,829.50	12.90 N	3.65 E	504,527.30	726,524.95	1.08	12.46	123.18	
3,832.00	1.40	149.45	3,831.50	12.85 N	3.68 E	504,527.25	726,524.98	1.08	12.42	122.45	
3,834.00	1.39	150.20	3,833.50	12.81 N	3.70 E	504,527.21	726,525.00	1.08	12.37	121.71	
3,836.00	1.38	150.97	3,835.50	12.77 N	3.73 E	504,527.17	726,525.03	1.08	12.33	120.96	
3,838.00	1.37	151.75	3,837.50	12.73 N	3.75 E	504,527.13	726,525.05	1.08	12.28	120.19	
3,840.00	1.36	152.54	3,839.50	12.69 N	3.77 E	504,527.09	726,525.07	1.08	12.24	119.41	
3,842.00	1.35	153.34	3,841.50	12.64 N	3.79 E	504,527.04	726,525.09	1.08	12.19	118.62	
3,844.00	1.34	154.16	3,843.50	12.60 N	3.82 E	504,527.00	726,525.12	1.08	12.15	117.82	
3,846.00	1.33	154.99	3,845.50	12.56 N	3.84 E	504,526.96	726,525.14	1.08	12.11	117.00	
3,848.00	1.32	155.83	3,847.50	12.52 N	3.85 E	504,526.92	726,525.15	1.08	12.06	116.17	
3,850.00	1.31	156.68	3,849.50	12.48 N	3.87 E	504,526.88	726,525.17	1.08	12.02	115.34	
3,852.00	1.30	157.54	3,851.50	12.43 N	3.89 E	504,526.83	726,525.19	1.08	11.98	114.48	
3,854.00	1.29	158.42	3,853.49	12.39 N	3.91 E	504,526.79	726,525.21	1.08	11.93	113.62	
3,856.00	1.29	159.30	3,855.49	12.35 N	3.92 E	504,526.75	726,525.22	1.08	11.89	112.75	
3,858.00	1.28	160.20	3,857.49	12.31 N	3.94 E	504,526.71	726,525.24	1.08	11.85	111.86	
3,860.00	1.27	161.11	3,859.49	12.27 N	3.95 E	504,526.67	726,525.25	1.08	11.80	110.97	
3,862.00	1.26	162.02	3,861.49	12.22 N	3.97 E	504,526.62	726,525.27	1.08	11.76	110.06	
3,864.00	1.26	162.95	3,863.49	12.18 N	3.98 E	504,526.58	726,525.28	1.08	11.72	109.14	
3,866.00	1.25	163.89	3,865.49	12.14 N	3.99 E	504,526.54	726,525.29	1.08	11.67	108.21	
3,868.00	1.24	164.84	3,867.49	12.10 N	4.01 E	504,526.50	726,525.31	1.08	11.63	107.27	
3,870.00	1.24	165.80	3,869.49	12.06 N	4.02 E	504,526.46	726,525.32	1.08	11.59	106.33	
3,872.00	1.23	166.76	3,871.49	12.01 N	4.03 E	504,526.41	726,525.33	1.08	11.54	105.37	
3,874.00	1.23	167.74	3,873.49	11.97 N	4.04 E	504,526.37	726,525.34	1.08	11.50	104.40	
3,876.00	1.22	168.72	3,875.49	11.93 N	4.05 E	504,526.33	726,525.35	1.08	11.46	103.43	
3,878.00	1.22	169.71	3,877.49	11.89 N	4.05 E	504,526.29	726,525.35	1.08	11.42	102.44	
3,880.00	1.21	170.71	3,879.49	11.85 N	4.06 E	504,526.25	726,525.36	1.08	11.37	101.45	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
3,882.00	1.21	171.71	3,881.49	11.80 N	4.07 E	504,526.20	726,525.37	1.08	11.33	100.46	
3,884.00	1.21	172.72	3,883.49	11.76 N	4.07 E	504,526.16	726,525.37	1.08	11.29	99.45	
3,886.00	1.20	173.74	3,885.49	11.72 N	4.08 E	504,526.12	726,525.38	1.08	11.25	98.44	
3,888.00	1.20	174.76	3,887.49	11.68 N	4.08 E	504,526.08	726,525.38	1.08	11.21	97.43	
3,890.00	1.20	175.78	3,889.49	11.64 N	4.09 E	504,526.04	726,525.39	1.08	11.16	96.41	
3,892.00	1.20	176.81	3,891.49	11.60 N	4.09 E	504,526.00	726,525.39	1.08	11.12	95.39	
3,894.00	1.20	177.84	3,893.49	11.55 N	4.09 E	504,525.95	726,525.39	1.08	11.08	94.36	
3,896.00	1.19	178.87	3,895.49	11.51 N	4.09 E	504,525.91	726,525.39	1.08	11.04	93.33	
3,898.00	1.19	179.90	3,897.48	11.47 N	4.09 E	504,525.87	726,525.39	1.08	11.00	92.30	
3,900.00	1.19	180.94	3,899.48	11.43 N	4.09 E	504,525.83	726,525.39	1.08	10.96	91.26	
3,902.00	1.19	181.97	3,901.48	11.39 N	4.09 E	504,525.79	726,525.39	1.08	10.92	90.23	
3,904.00	1.19	183.01	3,903.48	11.35 N	4.09 E	504,525.75	726,525.39	1.08	10.87	89.20	
3,906.00	1.19	184.04	3,905.48	11.30 N	4.09 E	504,525.70	726,525.39	1.08	10.83	88.16	
3,908.00	1.20	185.07	3,907.48	11.26 N	4.08 E	504,525.66	726,525.38	1.08	10.79	87.13	
3,910.00	1.20	186.10	3,909.48	11.22 N	4.08 E	504,525.62	726,525.38	1.08	10.75	86.10	
3,912.00	1.20	187.13	3,911.48	11.18 N	4.07 E	504,525.58	726,525.37	1.08	10.71	85.07	
3,914.00	1.20	188.15	3,913.48	11.14 N	4.07 E	504,525.54	726,525.37	1.08	10.67	84.04	
3,916.00	1.21	189.16	3,915.48	11.10 N	4.06 E	504,525.50	726,525.36	1.08	10.63	83.02	
3,918.00	1.21	190.18	3,917.48	11.06 N	4.05 E	504,525.46	726,525.35	1.08	10.59	82.01	
3,920.00	1.21	190.68	3,919.48	11.01 N	4.05 E	504,525.41	726,525.35	0.54	10.55	80.99	
3,922.00	1.22	190.23	3,921.48	10.97 N	4.04 E	504,525.37	726,525.34	0.58	10.51	-55.12	
3,924.00	1.22	189.93	3,923.48	10.93 N	4.03 E	504,525.33	726,525.33	0.39	10.47	-54.67	
3,926.00	1.23	189.64	3,925.48	10.89 N	4.02 E	504,525.29	726,525.32	0.39	10.42	-54.37	
3,928.00	1.23	189.34	3,927.48	10.85 N	4.02 E	504,525.25	726,525.32	0.39	10.38	-54.08	
3,930.00	1.23	189.05	3,929.48	10.80 N	4.01 E	504,525.20	726,525.31	0.39	10.34	-53.79	
3,932.00	1.24	188.77	3,931.48	10.76 N	4.00 E	504,525.16	726,525.30	0.39	10.30	-53.50	
3,934.00	1.24	188.48	3,933.48	10.72 N	4.00 E	504,525.12	726,525.30	0.39	10.26	-53.21	
3,936.00	1.25	188.19	3,935.48	10.67 N	3.99 E	504,525.07	726,525.29	0.39	10.22	-52.92	
3,938.00	1.25	187.91	3,937.48	10.63 N	3.98 E	504,525.03	726,525.28	0.39	10.17	-52.64	
3,940.00	1.26	187.63	3,939.48	10.59 N	3.98 E	504,524.99	726,525.28	0.39	10.13	-52.35	
3,942.00	1.26	187.35	3,941.47	10.54 N	3.97 E	504,524.94	726,525.27	0.39	10.09	-52.07	
3,944.00	1.27	187.08	3,943.47	10.50 N	3.97 E	504,524.90	726,525.27	0.39	10.04	-51.80	
3,946.00	1.27	186.80	3,945.47	10.46 N	3.96 E	504,524.86	726,525.26	0.39	10.00	-51.52	
3,948.00	1.28	186.53	3,947.47	10.41 N	3.96 E	504,524.81	726,525.26	0.39	9.96	-51.25	
3,950.00	1.28	186.26	3,949.47	10.37 N	3.95 E	504,524.77	726,525.25	0.39	9.91	-50.98	
3,952.00	1.29	186.00	3,951.47	10.32 N	3.95 E	504,524.72	726,525.25	0.39	9.87	-50.71	
3,954.00	1.29	185.73	3,953.47	10.28 N	3.94 E	504,524.68	726,525.24	0.39	9.83	-50.44	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

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				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
3,956.00	1.30	185.47	3,955.47	10.23 N	3.94 E	504,524.63	726,525.24	0.39	9.78	-50.17	
3,958.00	1.30	185.21	3,957.47	10.19 N	3.93 E	504,524.59	726,525.23	0.39	9.74	-49.91	
3,960.00	1.31	184.95	3,959.47	10.14 N	3.93 E	504,524.54	726,525.23	0.39	9.69	-49.65	
3,962.00	1.31	184.69	3,961.47	10.10 N	3.93 E	504,524.50	726,525.23	0.39	9.65	-49.39	
3,964.00	1.32	184.43	3,963.47	10.05 N	3.92 E	504,524.45	726,525.22	0.39	9.60	-49.13	
3,966.00	1.32	184.18	3,965.47	10.01 N	3.92 E	504,524.41	726,525.22	0.39	9.56	-48.88	
3,968.00	1.33	183.93	3,967.47	9.96 N	3.92 E	504,524.36	726,525.22	0.39	9.51	-48.62	
3,970.00	1.33	183.68	3,969.47	9.91 N	3.91 E	504,524.31	726,525.21	0.39	9.47	-48.37	
3,972.00	1.34	183.43	3,971.47	9.87 N	3.91 E	504,524.27	726,525.21	0.39	9.42	-48.12	
3,974.00	1.34	183.19	3,973.47	9.82 N	3.91 E	504,524.22	726,525.21	0.39	9.37	-47.87	
3,976.00	1.35	182.94	3,975.47	9.77 N	3.90 E	504,524.17	726,525.20	0.39	9.33	-47.63	
3,978.00	1.35	182.70	3,977.47	9.73 N	3.90 E	504,524.13	726,525.20	0.39	9.28	-47.39	
3,980.00	1.36	182.46	3,979.46	9.68 N	3.90 E	504,524.08	726,525.20	0.39	9.23	-47.14	
3,982.00	1.36	182.22	3,981.46	9.63 N	3.90 E	504,524.03	726,525.20	0.39	9.19	-46.90	
3,984.00	1.37	181.99	3,983.46	9.58 N	3.90 E	504,523.98	726,525.20	0.39	9.14	-46.67	
3,986.00	1.38	181.75	3,985.46	9.54 N	3.90 E	504,523.94	726,525.20	0.39	9.09	-46.43	
3,988.00	1.38	181.52	3,987.46	9.49 N	3.89 E	504,523.89	726,525.19	0.39	9.04	-46.19	
3,990.00	1.39	181.29	3,989.46	9.44 N	3.89 E	504,523.84	726,525.19	0.39	9.00	-45.96	
3,992.00	1.39	181.06	3,991.46	9.39 N	3.89 E	504,523.79	726,525.19	0.39	8.95	-45.73	
3,994.00	1.40	180.83	3,993.46	9.34 N	3.89 E	504,523.74	726,525.19	0.39	8.90	-45.50	
3,996.00	1.40	180.61	3,995.46	9.29 N	3.89 E	504,523.69	726,525.19	0.39	8.85	-45.28	
3,998.00	1.41	180.38	3,997.46	9.24 N	3.89 E	504,523.64	726,525.19	0.39	8.80	-45.05	
4,000.00	1.41	180.16	3,999.46	9.19 N	3.89 E	504,523.59	726,525.19	0.39	8.75	-44.83	
4,002.00	1.42	179.94	4,001.46	9.15 N	3.89 E	504,523.55	726,525.19	0.39	8.70	-44.60	
4,004.00	1.42	179.72	4,003.46	9.10 N	3.89 E	504,523.50	726,525.19	0.39	8.66	-44.38	
4,006.00	1.43	179.51	4,005.46	9.05 N	3.89 E	504,523.45	726,525.19	0.39	8.61	-44.17	
4,008.00	1.44	179.29	4,007.46	9.00 N	3.89 E	504,523.40	726,525.19	0.39	8.56	-43.95	
4,010.00	1.44	179.08	4,009.46	8.95 N	3.89 E	504,523.35	726,525.19	0.39	8.51	-43.73	
4,012.00	1.45	178.87	4,011.46	8.90 N	3.89 E	504,523.30	726,525.19	0.39	8.46	-43.52	
4,014.00	1.45	178.76	4,013.45	8.84 N	3.89 E	504,523.24	726,525.19	0.19	8.41	-43.31	
4,016.00	1.44	178.34	4,015.45	8.79 N	3.89 E	504,523.19	726,525.19	0.64	8.35	-125.26	
4,018.00	1.44	178.06	4,017.45	8.74 N	3.90 E	504,523.14	726,525.20	0.43	8.30	-124.84	
4,020.00	1.43	177.78	4,019.45	8.69 N	3.90 E	504,523.09	726,525.20	0.43	8.25	-124.56	
4,022.00	1.43	177.50	4,021.45	8.64 N	3.90 E	504,523.04	726,525.20	0.43	8.20	-124.28	
4,024.00	1.42	177.21	4,023.45	8.59 N	3.90 E	504,522.99	726,525.20	0.43	8.16	-124.00	
4,026.00	1.42	176.93	4,025.45	8.54 N	3.90 E	504,522.94	726,525.20	0.43	8.11	-123.71	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
4,028.00	1.41	176.64	4,027.45	8.50 N	3.91 E	504,522.90	726,525.21	0.43	8.06	-123.42	
4,030.00	1.41	176.35	4,029.45	8.45 N	3.91 E	504,522.85	726,525.21	0.43	8.01	-123.13	
4,032.00	1.40	176.05	4,031.45	8.40 N	3.91 E	504,522.80	726,525.21	0.43	7.96	-122.84	
4,034.00	1.40	175.76	4,033.45	8.35 N	3.92 E	504,522.75	726,525.22	0.43	7.91	-122.55	
4,036.00	1.40	175.46	4,035.45	8.30 N	3.92 E	504,522.70	726,525.22	0.43	7.86	-122.26	
4,038.00	1.39	175.16	4,037.45	8.25 N	3.93 E	504,522.65	726,525.23	0.43	7.81	-121.96	
4,040.00	1.39	174.86	4,039.45	8.20 N	3.93 E	504,522.60	726,525.23	0.43	7.76	-121.66	
4,042.00	1.38	174.56	4,041.45	8.16 N	3.93 E	504,522.56	726,525.23	0.43	7.71	-121.36	
4,044.00	1.38	174.25	4,043.45	8.11 N	3.94 E	504,522.51	726,525.24	0.43	7.67	-121.06	
4,046.00	1.37	173.95	4,045.44	8.06 N	3.94 E	504,522.46	726,525.24	0.43	7.62	-120.75	
4,048.00	1.37	173.64	4,047.44	8.01 N	3.95 E	504,522.41	726,525.25	0.43	7.57	-120.45	
4,050.00	1.36	173.33	4,049.44	7.96 N	3.95 E	504,522.36	726,525.25	0.43	7.52	-120.14	
4,052.00	1.36	173.02	4,051.44	7.92 N	3.96 E	504,522.32	726,525.26	0.43	7.48	-119.83	
4,054.00	1.36	172.70	4,053.44	7.87 N	3.97 E	504,522.27	726,525.27	0.43	7.43	-119.51	
4,056.00	1.35	172.39	4,055.44	7.82 N	3.97 E	504,522.22	726,525.27	0.43	7.38	-119.20	
4,058.00	1.35	172.07	4,057.44	7.78 N	3.98 E	504,522.18	726,525.28	0.43	7.33	-118.88	
4,060.00	1.34	171.75	4,059.44	7.73 N	3.98 E	504,522.13	726,525.28	0.43	7.29	-118.57	
4,062.00	1.34	171.43	4,061.44	7.68 N	3.99 E	504,522.08	726,525.29	0.43	7.24	-118.25	
4,064.00	1.34	171.10	4,063.44	7.64 N	4.00 E	504,522.04	726,525.30	0.43	7.19	-117.92	
4,066.00	1.33	170.78	4,065.44	7.59 N	4.01 E	504,521.99	726,525.31	0.43	7.15	-117.60	
4,068.00	1.33	170.45	4,067.44	7.55 N	4.01 E	504,521.95	726,525.31	0.43	7.10	-117.27	
4,070.00	1.32	170.12	4,069.44	7.50 N	4.02 E	504,521.90	726,525.32	0.43	7.05	-116.95	
4,072.00	1.32	169.79	4,071.44	7.45 N	4.03 E	504,521.85	726,525.33	0.43	7.01	-116.62	
4,074.00	1.32	169.45	4,073.44	7.41 N	4.04 E	504,521.81	726,525.34	0.43	6.96	-116.29	
4,076.00	1.31	169.12	4,075.44	7.36 N	4.05 E	504,521.76	726,525.35	0.43	6.92	-115.95	
4,078.00	1.31	168.78	4,077.44	7.32 N	4.05 E	504,521.72	726,525.35	0.43	6.87	-115.62	
4,080.00	1.31	168.44	4,079.44	7.27 N	4.06 E	504,521.67	726,525.36	0.43	6.83	-115.28	
4,082.00	1.30	168.10	4,081.44	7.23 N	4.07 E	504,521.63	726,525.37	0.43	6.78	-114.94	
4,084.00	1.30	167.76	4,083.43	7.19 N	4.08 E	504,521.59	726,525.38	0.43	6.74	-114.60	
4,086.00	1.30	167.41	4,085.43	7.14 N	4.09 E	504,521.54	726,525.39	0.43	6.69	-114.26	
4,088.00	1.29	167.07	4,087.43	7.10 N	4.10 E	504,521.50	726,525.40	0.43	6.65	-113.91	
4,090.00	1.29	166.72	4,089.43	7.05 N	4.11 E	504,521.45	726,525.41	0.43	6.60	-113.57	
4,092.00	1.29	166.37	4,091.43	7.01 N	4.12 E	504,521.41	726,525.42	0.43	6.56	-113.22	
4,094.00	1.28	166.01	4,093.43	6.97 N	4.13 E	504,521.37	726,525.43	0.43	6.51	-112.87	
4,096.00	1.28	165.66	4,095.43	6.92 N	4.14 E	504,521.32	726,525.44	0.43	6.47	-112.51	
4,098.00	1.28	165.31	4,097.43	6.88 N	4.16 E	504,521.28	726,525.46	0.43	6.42	-112.16	
4,100.00	1.27	164.95	4,099.43	6.84 N	4.17 E	504,521.24	726,525.47	0.43	6.38	-111.80	



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Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
4,102.00	1.27	164.59	4,101.43	6.79 N	4.18 E	504,521.19	726,525.48	0.43	6.34	-111.45	
4,104.00	1.27	164.23	4,103.43	6.75 N	4.19 E	504,521.15	726,525.49	0.43	6.29	-111.09	
4,106.00	1.26	163.86	4,105.43	6.71 N	4.20 E	504,521.11	726,525.50	0.43	6.25	-110.73	
4,108.00	1.26	163.50	4,107.43	6.67 N	4.22 E	504,521.07	726,525.52	0.43	6.21	-110.36	
4,110.00	1.23	164.11	4,109.43	6.63 N	4.23 E	504,521.03	726,525.53	1.50	6.16	154.24	
4,112.00	1.21	164.74	4,111.43	6.58 N	4.24 E	504,520.98	726,525.54	1.50	6.12	153.63	
4,114.00	1.18	165.40	4,113.43	6.54 N	4.25 E	504,520.94	726,525.55	1.50	6.08	153.00	
4,116.00	1.15	166.09	4,115.43	6.50 N	4.26 E	504,520.90	726,525.56	1.50	6.04	152.34	
4,118.00	1.13	166.82	4,117.43	6.47 N	4.27 E	504,520.87	726,525.57	1.50	6.00	151.64	
4,120.00	1.10	167.58	4,119.43	6.43 N	4.28 E	504,520.83	726,525.58	1.50	5.96	150.92	
4,122.00	1.07	168.37	4,121.43	6.39 N	4.29 E	504,520.79	726,525.59	1.50	5.92	150.16	
4,124.00	1.05	169.21	4,123.43	6.35 N	4.29 E	504,520.75	726,525.59	1.50	5.89	149.36	
4,126.00	1.02	170.09	4,125.42	6.32 N	4.30 E	504,520.72	726,525.60	1.50	5.85	148.53	
4,128.00	1.00	171.01	4,127.42	6.28 N	4.30 E	504,520.68	726,525.60	1.50	5.82	147.65	
4,130.00	0.97	171.98	4,129.42	6.25 N	4.31 E	504,520.65	726,525.61	1.50	5.78	146.73	
4,132.00	0.95	173.00	4,131.42	6.22 N	4.31 E	504,520.62	726,525.61	1.50	5.75	145.76	
4,134.00	0.92	174.07	4,133.42	6.18 N	4.32 E	504,520.58	726,525.62	1.50	5.72	144.74	
4,136.00	0.90	175.20	4,135.42	6.15 N	4.32 E	504,520.55	726,525.62	1.50	5.68	143.67	
4,138.00	0.88	176.40	4,137.42	6.12 N	4.32 E	504,520.52	726,525.62	1.50	5.65	142.54	
4,140.00	0.85	177.66	4,139.42	6.09 N	4.32 E	504,520.49	726,525.62	1.50	5.62	141.34	
4,142.00	0.83	178.98	4,141.42	6.06 N	4.33 E	504,520.46	726,525.63	1.50	5.59	140.09	
4,144.00	0.81	180.39	4,143.42	6.03 N	4.33 E	504,520.43	726,525.63	1.50	5.56	138.76	
4,146.00	0.79	181.87	4,145.42	6.01 N	4.33 E	504,520.41	726,525.63	1.50	5.54	137.35	
4,148.00	0.77	183.43	4,147.42	5.98 N	4.32 E	504,520.38	726,525.62	1.50	5.51	135.87	
4,150.00	0.74	185.08	4,149.42	5.95 N	4.32 E	504,520.35	726,525.62	1.50	5.48	134.31	
4,152.00	0.72	186.83	4,151.42	5.93 N	4.32 E	504,520.33	726,525.62	1.50	5.46	132.66	
4,154.00	0.71	188.67	4,153.42	5.90 N	4.32 E	504,520.30	726,525.62	1.50	5.43	130.91	
4,156.00	0.69	190.62	4,155.42	5.88 N	4.31 E	504,520.28	726,525.61	1.50	5.41	129.07	
4,158.00	0.67	192.67	4,157.42	5.85 N	4.31 E	504,520.25	726,525.61	1.50	5.39	127.12	
4,160.00	0.65	194.83	4,159.42	5.83 N	4.30 E	504,520.23	726,525.60	1.50	5.37	125.07	
4,162.00	0.64	197.09	4,161.42	5.81 N	4.30 E	504,520.21	726,525.60	1.50	5.35	122.92	
4,164.00	0.62	199.47	4,163.42	5.79 N	4.29 E	504,520.19	726,525.59	1.50	5.33	120.65	
4,166.00	0.61	201.96	4,165.42	5.77 N	4.28 E	504,520.17	726,525.58	1.50	5.31	118.27	
4,168.00	0.60	204.57	4,167.42	5.75 N	4.27 E	504,520.15	726,525.57	1.50	5.29	115.78	
4,170.00	0.58	207.27	4,169.42	5.73 N	4.26 E	504,520.13	726,525.56	1.50	5.27	113.18	
4,172.00	0.57	210.07	4,171.42	5.71 N	4.25 E	504,520.11	726,525.55	1.50	5.25	110.47	
4,174.00	0.57	212.97	4,173.42	5.70 N	4.24 E	504,520.10	726,525.54	1.50	5.24	107.67	



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				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
4,176.00	0.56	215.94	4,175.42	5.68 N	4.23 E	504,520.08	726,525.53	1.50	5.22	104.77	
4,178.00	0.55	218.98	4,177.42	5.67 N	4.22 E	504,520.07	726,525.52	1.50	5.21	101.80	
4,180.00	0.55	222.07	4,179.42	5.65 N	4.21 E	504,520.05	726,525.51	1.50	5.20	98.76	
4,182.00	0.55	225.19	4,181.42	5.64 N	4.20 E	504,520.04	726,525.50	1.50	5.18	95.67	
4,184.00	0.55	228.33	4,183.42	5.62 N	4.18 E	504,520.02	726,525.48	1.50	5.17	92.55	
4,186.00	0.55	231.47	4,185.42	5.61 N	4.17 E	504,520.01	726,525.47	1.50	5.16	89.41	
4,188.00	0.55	234.58	4,187.42	5.60 N	4.15 E	504,520.00	726,525.45	1.50	5.15	86.28	
4,190.00	0.56	237.65	4,189.42	5.59 N	4.14 E	504,519.99	726,525.44	1.50	5.14	83.16	
4,192.00	0.56	240.67	4,191.42	5.58 N	4.12 E	504,519.98	726,525.42	1.50	5.13	80.09	
4,194.00	0.57	243.62	4,193.42	5.57 N	4.10 E	504,519.97	726,525.40	1.50	5.13	77.07	
4,196.00	0.58	246.48	4,195.42	5.56 N	4.08 E	504,519.96	726,525.38	1.50	5.12	74.13	
4,198.00	0.59	249.25	4,197.42	5.55 N	4.06 E	504,519.95	726,525.36	1.50	5.11	71.27	
4,200.00	0.60	251.91	4,199.42	5.55 N	4.04 E	504,519.95	726,525.34	1.50	5.11	68.50	
4,202.00	0.61	254.47	4,201.42	5.54 N	4.02 E	504,519.94	726,525.32	1.50	5.11	65.83	
4,204.00	0.62	255.71	4,203.42	5.54 N	4.00 E	504,519.94	726,525.30	0.75	5.10	63.27	
4,206.00	0.62	255.71	4,205.42	5.53 N	3.98 E	504,519.93	726,525.28	0.00	5.10	0.00	
4,208.00	0.62	255.02	4,207.42	5.52 N	3.96 E	504,519.92	726,525.26	0.39	5.10	-72.25	
4,210.00	0.62	254.74	4,209.42	5.52 N	3.94 E	504,519.92	726,525.24	0.16	5.09	-71.56	
4,212.00	0.62	254.47	4,211.42	5.51 N	3.92 E	504,519.91	726,525.22	0.16	5.09	-71.28	
4,214.00	0.63	254.20	4,213.42	5.51 N	3.90 E	504,519.91	726,525.20	0.16	5.08	-71.01	
4,216.00	0.63	253.92	4,215.42	5.50 N	3.88 E	504,519.90	726,525.18	0.16	5.08	-70.73	
4,218.00	0.63	253.65	4,217.42	5.50 N	3.86 E	504,519.90	726,525.16	0.16	5.08	-70.46	
4,220.00	0.63	253.38	4,219.42	5.49 N	3.84 E	504,519.89	726,525.14	0.16	5.07	-70.19	
4,222.00	0.63	253.11	4,221.42	5.48 N	3.81 E	504,519.88	726,525.11	0.16	5.07	-69.92	
4,224.00	0.63	252.85	4,223.42	5.48 N	3.79 E	504,519.88	726,525.09	0.16	5.06	-69.65	
4,226.00	0.63	252.58	4,225.42	5.47 N	3.77 E	504,519.87	726,525.07	0.16	5.06	-69.38	
4,228.00	0.63	252.31	4,227.42	5.46 N	3.75 E	504,519.86	726,525.05	0.16	5.06	-69.11	
4,230.00	0.63	252.05	4,229.42	5.46 N	3.73 E	504,519.86	726,525.03	0.16	5.05	-68.85	
4,232.00	0.64	251.78	4,231.42	5.45 N	3.71 E	504,519.85	726,525.01	0.16	5.05	-68.58	
4,234.00	0.64	251.52	4,233.42	5.44 N	3.69 E	504,519.84	726,524.99	0.16	5.04	-68.32	
4,236.00	0.64	251.25	4,235.42	5.44 N	3.67 E	504,519.84	726,524.97	0.16	5.04	-68.05	
4,238.00	0.64	250.99	4,237.42	5.43 N	3.65 E	504,519.83	726,524.95	0.16	5.03	-67.79	
4,240.00	0.64	250.73	4,239.42	5.42 N	3.62 E	504,519.82	726,524.92	0.16	5.03	-67.53	
4,242.00	0.64	250.47	4,241.42	5.41 N	3.60 E	504,519.81	726,524.90	0.16	5.02	-67.27	
4,244.00	0.64	250.21	4,243.42	5.41 N	3.58 E	504,519.81	726,524.88	0.16	5.02	-67.01	
4,246.00	0.64	249.96	4,245.42	5.40 N	3.56 E	504,519.80	726,524.86	0.16	5.01	-66.75	

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				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
4,248.00	0.65	249.70	4,247.42	5.39 N	3.54 E	504,519.79	726,524.84	0.16	5.00	-66.49	
4,250.00	0.65	249.44	4,249.42	5.38 N	3.52 E	504,519.78	726,524.82	0.16	5.00	-66.23	
4,252.00	0.65	249.19	4,251.42	5.37 N	3.50 E	504,519.77	726,524.80	0.16	4.99	-65.98	
4,254.00	0.65	248.93	4,253.42	5.37 N	3.48 E	504,519.77	726,524.78	0.16	4.99	-65.72	
4,256.00	0.65	248.68	4,255.42	5.36 N	3.46 E	504,519.76	726,524.76	0.16	4.98	-65.47	
4,258.00	0.65	248.43	4,257.42	5.35 N	3.43 E	504,519.75	726,524.73	0.16	4.97	-65.22	
4,260.00	0.65	248.18	4,259.42	5.34 N	3.41 E	504,519.74	726,524.71	0.16	4.97	-64.97	
4,262.00	0.65	247.93	4,261.42	5.33 N	3.39 E	504,519.73	726,524.69	0.16	4.96	-64.72	
4,264.00	0.66	247.68	4,263.42	5.32 N	3.37 E	504,519.72	726,524.67	0.16	4.96	-64.47	
4,266.00	0.66	247.43	4,265.42	5.32 N	3.35 E	504,519.72	726,524.65	0.16	4.95	-64.22	
4,268.00	0.66	247.19	4,267.42	5.31 N	3.33 E	504,519.71	726,524.63	0.16	4.94	-63.97	
4,270.00	0.66	246.94	4,269.42	5.30 N	3.31 E	504,519.70	726,524.61	0.16	4.94	-63.72	
4,272.00	0.66	246.70	4,271.41	5.29 N	3.29 E	504,519.69	726,524.59	0.16	4.93	-63.48	
4,274.00	0.66	246.45	4,273.41	5.28 N	3.27 E	504,519.68	726,524.57	0.16	4.92	-63.23	
4,276.00	0.66	246.21	4,275.41	5.27 N	3.24 E	504,519.67	726,524.54	0.16	4.91	-62.99	
4,278.00	0.67	245.97	4,277.41	5.26 N	3.22 E	504,519.66	726,524.52	0.16	4.91	-62.75	
4,280.00	0.67	245.73	4,279.41	5.25 N	3.20 E	504,519.65	726,524.50	0.16	4.90	-62.51	
4,282.00	0.67	245.49	4,281.41	5.24 N	3.18 E	504,519.64	726,524.48	0.16	4.89	-62.27	
4,284.00	0.67	245.25	4,283.41	5.23 N	3.16 E	504,519.63	726,524.46	0.16	4.89	-62.03	
4,286.00	0.67	245.01	4,285.41	5.22 N	3.14 E	504,519.62	726,524.44	0.16	4.88	-61.79	
4,288.00	0.67	244.78	4,287.41	5.21 N	3.12 E	504,519.61	726,524.42	0.16	4.87	-61.55	
4,290.00	0.67	244.54	4,289.41	5.20 N	3.10 E	504,519.60	726,524.40	0.16	4.86	-61.32	
4,292.00	0.68	244.31	4,291.41	5.19 N	3.07 E	504,519.59	726,524.37	0.16	4.85	-61.08	
4,294.00	0.68	244.08	4,293.41	5.18 N	3.05 E	504,519.58	726,524.35	0.16	4.85	-60.85	
4,296.00	0.68	243.85	4,295.41	5.17 N	3.03 E	504,519.57	726,524.33	0.16	4.84	-60.61	
4,298.00	0.68	243.73	4,297.41	5.16 N	3.01 E	504,519.56	726,524.31	0.08	4.83	-60.38	
4,300.00	0.67	243.33	4,299.41	5.15 N	2.99 E	504,519.55	726,524.29	0.51	4.82	-152.84	
4,302.00	0.66	243.06	4,301.41	5.14 N	2.97 E	504,519.54	726,524.27	0.34	4.81	-152.44	
4,304.00	0.66	242.79	4,303.41	5.13 N	2.95 E	504,519.53	726,524.25	0.34	4.80	-152.17	
4,306.00	0.65	242.51	4,305.41	5.12 N	2.93 E	504,519.52	726,524.23	0.34	4.80	-151.90	
4,308.00	0.65	242.22	4,307.41	5.11 N	2.91 E	504,519.51	726,524.21	0.34	4.79	-151.62	
4,310.00	0.64	241.93	4,309.41	5.10 N	2.89 E	504,519.50	726,524.19	0.34	4.78	-151.33	
4,312.00	0.64	241.64	4,311.41	5.09 N	2.87 E	504,519.49	726,524.17	0.34	4.77	-151.04	
4,314.00	0.63	241.33	4,313.41	5.08 N	2.85 E	504,519.48	726,524.15	0.34	4.76	-150.75	
4,316.00	0.62	241.03	4,315.41	5.07 N	2.83 E	504,519.47	726,524.13	0.34	4.75	-150.45	
4,318.00	0.62	240.71	4,317.41	5.06 N	2.81 E	504,519.46	726,524.11	0.34	4.74	-150.14	
4,320.00	0.61	240.39	4,319.41	5.05 N	2.79 E	504,519.45	726,524.09	0.34	4.74	-149.82	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
4,322.00	0.61	240.07	4,321.41	5.03 N	2.77 E	504,519.43	726,524.07	0.34	4.73	-149.51	
4,324.00	0.60	239.74	4,323.41	5.02 N	2.75 E	504,519.42	726,524.05	0.34	4.72	-149.18	
4,326.00	0.59	239.40	4,325.41	5.01 N	2.74 E	504,519.41	726,524.04	0.34	4.71	-148.85	
4,328.00	0.59	239.05	4,327.41	5.00 N	2.72 E	504,519.40	726,524.02	0.34	4.70	-148.51	
4,330.00	0.58	238.70	4,329.41	4.99 N	2.70 E	504,519.39	726,524.00	0.34	4.69	-148.16	
4,332.00	0.58	238.34	4,331.41	4.98 N	2.68 E	504,519.38	726,523.98	0.34	4.68	-147.81	
4,334.00	0.57	237.98	4,333.41	4.97 N	2.67 E	504,519.37	726,523.97	0.34	4.68	-147.45	
4,336.00	0.57	237.60	4,335.41	4.96 N	2.65 E	504,519.36	726,523.95	0.34	4.67	-147.09	
4,338.00	0.56	237.22	4,337.41	4.95 N	2.63 E	504,519.35	726,523.93	0.34	4.66	-146.72	
4,340.00	0.55	236.83	4,339.41	4.94 N	2.62 E	504,519.34	726,523.92	0.34	4.65	-146.33	
4,342.00	0.55	236.44	4,341.41	4.93 N	2.60 E	504,519.33	726,523.90	0.34	4.64	-145.95	
4,344.00	0.54	236.03	4,343.41	4.92 N	2.59 E	504,519.32	726,523.89	0.34	4.63	-145.55	
4,346.00	0.54	235.62	4,345.41	4.91 N	2.57 E	504,519.31	726,523.87	0.34	4.62	-145.15	
4,348.00	0.53	235.20	4,347.41	4.90 N	2.55 E	504,519.30	726,523.85	0.34	4.61	-144.73	
4,350.00	0.53	234.77	4,349.41	4.89 N	2.54 E	504,519.29	726,523.84	0.34	4.60	-144.31	
4,352.00	0.52	234.33	4,351.41	4.88 N	2.52 E	504,519.28	726,523.82	0.34	4.60	-143.88	
4,354.00	0.52	233.88	4,353.41	4.87 N	2.51 E	504,519.27	726,523.81	0.34	4.59	-143.44	
4,356.00	0.51	233.42	4,355.41	4.85 N	2.50 E	504,519.25	726,523.80	0.34	4.58	-142.99	
4,358.00	0.50	232.95	4,357.41	4.84 N	2.48 E	504,519.24	726,523.78	0.34	4.57	-142.53	
4,360.00	0.50	232.48	4,359.41	4.83 N	2.47 E	504,519.23	726,523.77	0.34	4.56	-142.07	
4,362.00	0.49	231.99	4,361.41	4.82 N	2.45 E	504,519.22	726,523.75	0.34	4.55	-141.59	
4,364.00	0.49	231.49	4,363.41	4.81 N	2.44 E	504,519.21	726,523.74	0.34	4.54	-141.10	
4,366.00	0.48	230.98	4,365.41	4.80 N	2.43 E	504,519.20	726,523.73	0.34	4.53	-140.60	
4,368.00	0.48	230.46	4,367.41	4.79 N	2.41 E	504,519.19	726,523.71	0.34	4.52	-140.09	
4,370.00	0.47	229.93	4,369.41	4.78 N	2.40 E	504,519.18	726,523.70	0.34	4.51	-139.57	
4,372.00	0.47	229.38	4,371.41	4.77 N	2.39 E	504,519.17	726,523.69	0.34	4.50	-139.04	
4,374.00	0.46	228.83	4,373.41	4.76 N	2.38 E	504,519.16	726,523.68	0.34	4.49	-138.49	
4,376.00	0.46	228.26	4,375.41	4.75 N	2.36 E	504,519.15	726,523.66	0.34	4.48	-137.94	
4,378.00	0.45	227.68	4,377.41	4.74 N	2.35 E	504,519.14	726,523.65	0.34	4.47	-137.37	
4,380.00	0.45	227.08	4,379.41	4.73 N	2.34 E	504,519.13	726,523.64	0.34	4.47	-136.79	
4,382.00	0.44	226.48	4,381.41	4.72 N	2.33 E	504,519.12	726,523.63	0.34	4.46	-136.20	
4,384.00	0.44	225.86	4,383.41	4.71 N	2.32 E	504,519.11	726,523.62	0.34	4.45	-135.59	
4,386.00	0.43	225.23	4,385.41	4.69 N	2.31 E	504,519.09	726,523.61	0.34	4.44	-134.97	
4,388.00	0.43	224.58	4,387.41	4.68 N	2.30 E	504,519.08	726,523.60	0.34	4.43	-134.34	
4,390.00	0.42	223.92	4,389.41	4.67 N	2.29 E	504,519.07	726,523.59	0.34	4.42	-133.69	
4,392.00	0.42	223.24	4,391.41	4.66 N	2.28 E	504,519.06	726,523.58	0.34	4.41	-133.03	
4,394.00	0.43	223.48	4,393.41	4.65 N	2.27 E	504,519.05	726,523.57	0.42	4.40	12.53	



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Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
4,396.00	0.44	223.72	4,395.41	4.64 N	2.26 E	504,519.04	726,523.56	0.42	4.39	12.28	
4,398.00	0.44	223.94	4,397.41	4.63 N	2.25 E	504,519.03	726,523.55	0.42	4.38	12.05	
4,400.00	0.45	224.16	4,399.41	4.62 N	2.23 E	504,519.02	726,523.53	0.42	4.37	11.82	
4,402.00	0.46	224.37	4,401.41	4.61 N	2.22 E	504,519.01	726,523.52	0.42	4.36	11.61	
4,404.00	0.47	224.57	4,403.41	4.60 N	2.21 E	504,519.00	726,523.51	0.42	4.35	11.40	
4,406.00	0.48	224.77	4,405.41	4.58 N	2.20 E	504,518.98	726,523.50	0.42	4.34	11.19	
4,408.00	0.49	224.96	4,407.41	4.57 N	2.19 E	504,518.97	726,523.49	0.42	4.33	11.00	
4,410.00	0.49	225.14	4,409.41	4.56 N	2.18 E	504,518.96	726,523.48	0.42	4.32	10.81	
4,412.00	0.50	225.32	4,411.41	4.55 N	2.16 E	504,518.95	726,523.46	0.42	4.31	10.63	
4,414.00	0.51	225.49	4,413.41	4.54 N	2.15 E	504,518.94	726,523.45	0.42	4.29	10.45	
4,416.00	0.52	225.66	4,415.41	4.52 N	2.14 E	504,518.92	726,523.44	0.42	4.28	10.28	
4,418.00	0.53	225.82	4,417.41	4.51 N	2.13 E	504,518.91	726,523.43	0.42	4.27	10.11	
4,420.00	0.54	225.97	4,419.41	4.50 N	2.11 E	504,518.90	726,523.41	0.42	4.26	9.95	
4,422.00	0.54	226.12	4,421.41	4.48 N	2.10 E	504,518.88	726,523.40	0.42	4.25	9.80	
4,424.00	0.55	226.27	4,423.41	4.47 N	2.08 E	504,518.87	726,523.38	0.42	4.24	9.65	
4,426.00	0.56	226.41	4,425.41	4.46 N	2.07 E	504,518.86	726,523.37	0.42	4.22	9.50	
4,428.00	0.57	226.55	4,427.41	4.44 N	2.06 E	504,518.84	726,523.36	0.42	4.21	9.36	
4,430.00	0.58	226.68	4,429.41	4.43 N	2.04 E	504,518.83	726,523.34	0.42	4.20	9.22	
4,432.00	0.59	226.81	4,431.41	4.42 N	2.03 E	504,518.82	726,523.33	0.42	4.19	9.09	
4,434.00	0.59	226.94	4,433.41	4.40 N	2.01 E	504,518.80	726,523.31	0.42	4.18	8.96	
4,436.00	0.60	227.06	4,435.41	4.39 N	2.00 E	504,518.79	726,523.30	0.42	4.16	8.83	
4,438.00	0.61	227.18	4,437.41	4.37 N	1.98 E	504,518.77	726,523.28	0.42	4.15	8.71	
4,440.00	0.62	227.30	4,439.41	4.36 N	1.97 E	504,518.76	726,523.27	0.42	4.14	8.59	
4,442.00	0.63	227.41	4,441.41	4.34 N	1.95 E	504,518.74	726,523.25	0.42	4.12	8.47	
4,444.00	0.64	227.52	4,443.41	4.33 N	1.93 E	504,518.73	726,523.23	0.42	4.11	8.36	
4,446.00	0.64	227.63	4,445.41	4.31 N	1.92 E	504,518.71	726,523.22	0.42	4.10	8.25	
4,448.00	0.65	227.73	4,447.41	4.30 N	1.90 E	504,518.70	726,523.20	0.42	4.08	8.14	
4,450.00	0.66	227.83	4,449.41	4.28 N	1.88 E	504,518.68	726,523.18	0.42	4.07	8.04	
4,452.00	0.67	227.93	4,451.41	4.27 N	1.87 E	504,518.67	726,523.17	0.42	4.06	7.93	
4,454.00	0.68	228.03	4,453.41	4.25 N	1.85 E	504,518.65	726,523.15	0.42	4.04	7.84	
4,456.00	0.68	228.12	4,455.41	4.24 N	1.83 E	504,518.64	726,523.13	0.42	4.03	7.74	
4,458.00	0.69	228.22	4,457.41	4.22 N	1.81 E	504,518.62	726,523.11	0.42	4.02	7.64	
4,460.00	0.70	228.31	4,459.41	4.20 N	1.80 E	504,518.60	726,523.10	0.42	4.00	7.55	
4,462.00	0.71	228.39	4,461.41	4.19 N	1.78 E	504,518.59	726,523.08	0.42	3.99	7.46	
4,464.00	0.72	228.48	4,463.41	4.17 N	1.76 E	504,518.57	726,523.06	0.42	3.97	7.37	
4,466.00	0.73	228.56	4,465.41	4.15 N	1.74 E	504,518.55	726,523.04	0.42	3.96	7.29	

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				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
4,468.00	0.73	228.65	4,467.40	4.14 N	1.72 E	504,518.54	726,523.02	0.42	3.94	7.20	
4,470.00	0.74	228.73	4,469.40	4.12 N	1.70 E	504,518.52	726,523.00	0.42	3.93	7.12	
4,472.00	0.75	228.81	4,471.40	4.10 N	1.68 E	504,518.50	726,522.98	0.42	3.91	7.04	
4,474.00	0.76	228.88	4,473.40	4.09 N	1.66 E	504,518.49	726,522.96	0.42	3.90	6.96	
4,476.00	0.77	228.96	4,475.40	4.07 N	1.64 E	504,518.47	726,522.94	0.42	3.88	6.89	
4,478.00	0.78	229.03	4,477.40	4.05 N	1.62 E	504,518.45	726,522.92	0.42	3.87	6.81	
4,480.00	0.78	229.10	4,479.40	4.03 N	1.60 E	504,518.43	726,522.90	0.42	3.85	6.74	
4,482.00	0.79	229.17	4,481.40	4.02 N	1.58 E	504,518.42	726,522.88	0.42	3.83	6.66	
4,484.00	0.80	229.24	4,483.40	4.00 N	1.56 E	504,518.40	726,522.86	0.42	3.82	6.59	
4,486.00	0.81	229.31	4,485.40	3.98 N	1.54 E	504,518.38	726,522.84	0.42	3.80	6.53	
4,488.00	0.84	231.42	4,487.40	3.96 N	1.51 E	504,518.36	726,522.81	2.20	3.79	44.68	
4,490.00	0.87	233.36	4,489.40	3.94 N	1.49 E	504,518.34	726,522.79	2.20	3.77	42.57	
4,492.00	0.91	235.17	4,491.40	3.92 N	1.47 E	504,518.32	726,522.77	2.20	3.76	40.62	
4,494.00	0.94	236.85	4,493.40	3.91 N	1.44 E	504,518.31	726,522.74	2.20	3.74	38.82	
4,496.00	0.98	238.40	4,495.40	3.89 N	1.41 E	504,518.29	726,522.71	2.20	3.73	37.14	
4,498.00	1.01	239.85	4,497.40	3.87 N	1.38 E	504,518.27	726,522.68	2.20	3.71	35.59	
4,500.00	1.05	241.19	4,499.40	3.85 N	1.35 E	504,518.25	726,522.65	2.20	3.70	34.14	
4,502.00	1.07	241.83	4,501.40	3.83 N	1.32 E	504,518.23	726,522.62	1.10	3.68	32.80	
4,504.00	1.07	242.05	4,503.40	3.82 N	1.28 E	504,518.22	726,522.58	0.32	3.67	39.89	
4,506.00	1.08	242.19	4,505.40	3.80 N	1.25 E	504,518.20	726,522.55	0.21	3.65	39.67	
4,508.00	1.08	242.33	4,507.40	3.78 N	1.22 E	504,518.18	726,522.52	0.21	3.64	39.53	
4,510.00	1.08	242.47	4,509.40	3.76 N	1.18 E	504,518.16	726,522.48	0.21	3.63	39.39	
4,512.00	1.09	242.61	4,511.40	3.75 N	1.15 E	504,518.15	726,522.45	0.21	3.61	39.25	
4,514.00	1.09	242.75	4,513.40	3.73 N	1.12 E	504,518.13	726,522.42	0.21	3.60	39.11	
4,516.00	1.09	242.89	4,515.40	3.71 N	1.08 E	504,518.11	726,522.38	0.21	3.58	38.97	
4,518.00	1.10	243.03	4,517.40	3.69 N	1.05 E	504,518.09	726,522.35	0.21	3.57	38.83	
4,520.00	1.10	243.17	4,519.40	3.68 N	1.01 E	504,518.08	726,522.31	0.21	3.56	38.69	
4,522.00	1.10	243.30	4,521.40	3.66 N	0.98 E	504,518.06	726,522.28	0.21	3.54	38.55	
4,524.00	1.11	243.44	4,523.40	3.64 N	0.94 E	504,518.04	726,522.24	0.21	3.53	38.42	
4,526.00	1.11	243.57	4,525.40	3.63 N	0.91 E	504,518.03	726,522.21	0.21	3.51	38.28	
4,528.00	1.11	243.71	4,527.40	3.61 N	0.88 E	504,518.01	726,522.18	0.21	3.50	38.15	
4,530.00	1.12	243.84	4,529.40	3.59 N	0.84 E	504,517.99	726,522.14	0.21	3.49	38.01	
4,532.00	1.12	243.97	4,531.40	3.57 N	0.81 E	504,517.97	726,522.11	0.21	3.47	37.88	
4,534.00	1.12	244.10	4,533.40	3.56 N	0.77 E	504,517.96	726,522.07	0.21	3.46	37.75	
4,536.00	1.13	244.24	4,535.39	3.54 N	0.73 E	504,517.94	726,522.03	0.21	3.45	37.62	
4,538.00	1.13	244.37	4,537.39	3.52 N	0.70 E	504,517.92	726,522.00	0.21	3.43	37.48	
4,540.00	1.13	244.49	4,539.39	3.51 N	0.66 E	504,517.91	726,521.96	0.21	3.42	37.35	



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				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
4,542.00	1.14	244.62	4,541.39	3.49 N	0.63 E	504,517.89	726,521.93	0.21	3.41	37.23	
4,544.00	1.14	244.75	4,543.39	3.47 N	0.59 E	504,517.87	726,521.89	0.21	3.39	37.10	
4,546.00	1.14	244.88	4,545.39	3.45 N	0.56 E	504,517.85	726,521.86	0.21	3.38	36.97	
4,548.00	1.15	245.00	4,547.39	3.44 N	0.52 E	504,517.84	726,521.82	0.21	3.37	36.84	
4,550.00	1.15	245.13	4,549.39	3.42 N	0.48 E	504,517.82	726,521.78	0.21	3.35	36.72	
4,552.00	1.15	245.25	4,551.39	3.40 N	0.45 E	504,517.80	726,521.75	0.21	3.34	36.59	
4,554.00	1.16	245.38	4,553.39	3.39 N	0.41 E	504,517.79	726,521.71	0.21	3.33	36.47	
4,556.00	1.16	245.50	4,555.39	3.37 N	0.37 E	504,517.77	726,521.67	0.21	3.31	36.34	
4,558.00	1.16	245.62	4,557.39	3.35 N	0.34 E	504,517.75	726,521.64	0.21	3.30	36.22	
4,560.00	1.17	245.75	4,559.39	3.34 N	0.30 E	504,517.74	726,521.60	0.21	3.29	36.10	
4,561.81	1.17	245.86	4,561.20	3.32 N	0.27 E	504,517.72	726,521.57	0.21	3.28	35.97	9 5/8" Casing
4,562.00	1.17	245.87	4,561.39	3.32 N	0.26 E	504,517.72	726,521.56	0.21	3.28	35.87	
4,564.00	1.17	245.99	4,563.39	3.30 N	0.22 E	504,517.70	726,521.52	0.21	3.26	35.85	
4,566.00	1.18	246.11	4,565.39	3.29 N	0.19 E	504,517.69	726,521.49	0.21	3.25	35.73	
4,568.00	1.18	246.23	4,567.39	3.27 N	0.15 E	504,517.67	726,521.45	0.21	3.24	35.61	
4,570.00	1.19	246.34	4,569.39	3.25 N	0.11 E	504,517.65	726,521.41	0.21	3.23	35.49	
4,572.00	1.19	246.46	4,571.39	3.24 N	0.07 E	504,517.64	726,521.37	0.21	3.21	35.38	
4,574.00	1.19	246.58	4,573.39	3.22 N	0.04 E	504,517.62	726,521.34	0.21	3.20	35.26	
4,576.00	1.20	246.70	4,575.39	3.20 N	0.00 W	504,517.60	726,521.30	0.21	3.19	35.14	
4,578.00	1.20	246.81	4,577.39	3.19 N	0.04 W	504,517.59	726,521.26	0.21	3.17	35.03	
4,580.00	1.20	246.93	4,579.39	3.17 N	0.08 W	504,517.57	726,521.22	0.21	3.16	34.91	
4,582.00	1.21	247.04	4,581.39	3.15 N	0.12 W	504,517.55	726,521.18	0.21	3.15	34.79	
4,584.00	1.21	247.15	4,583.38	3.14 N	0.16 W	504,517.54	726,521.14	0.21	3.14	34.68	
4,586.00	1.21	247.27	4,585.38	3.12 N	0.20 W	504,517.52	726,521.10	0.21	3.13	34.57	
4,588.00	1.22	247.38	4,587.38	3.10 N	0.24 W	504,517.50	726,521.06	0.21	3.11	34.45	
4,590.00	1.22	247.49	4,589.38	3.09 N	0.27 W	504,517.49	726,521.03	0.21	3.10	34.34	
4,592.00	1.22	247.60	4,591.38	3.07 N	0.31 W	504,517.47	726,520.99	0.21	3.09	34.23	
4,594.00	1.23	247.71	4,593.38	3.06 N	0.35 W	504,517.46	726,520.95	0.21	3.08	34.12	
4,596.00	1.23	247.82	4,595.38	3.04 N	0.39 W	504,517.44	726,520.91	0.21	3.06	34.01	
4,598.00	1.23	247.93	4,597.38	3.02 N	0.43 W	504,517.42	726,520.87	0.21	3.05	33.90	
4,600.00	1.24	248.04	4,599.38	3.01 N	0.47 W	504,517.41	726,520.83	0.21	3.04	33.79	
4,602.00	1.24	248.15	4,601.38	2.99 N	0.51 W	504,517.39	726,520.79	0.21	3.03	33.68	
4,604.00	1.24	248.26	4,603.38	2.98 N	0.55 W	504,517.38	726,520.75	0.21	3.02	33.57	
4,606.00	1.25	248.36	4,605.38	2.96 N	0.59 W	504,517.36	726,520.71	0.21	3.00	33.47	
4,608.00	1.25	248.47	4,607.38	2.94 N	0.63 W	504,517.34	726,520.67	0.21	2.99	33.36	
4,610.00	1.25	248.57	4,609.38	2.93 N	0.68 W	504,517.33	726,520.62	0.21	2.98	33.25	
4,612.00	1.26	248.68	4,611.38	2.91 N	0.72 W	504,517.31	726,520.58	0.21	2.97	33.15	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
4,614.00	1.26	248.78	4,613.38	2.90 N	0.76 W	504,517.30	726,520.54	0.21	2.96	33.04	
4,616.00	1.27	248.89	4,615.38	2.88 N	0.80 W	504,517.28	726,520.50	0.21	2.95	32.94	
4,618.00	1.27	248.99	4,617.38	2.86 N	0.84 W	504,517.26	726,520.46	0.21	2.93	32.83	
4,620.00	1.27	249.09	4,619.38	2.85 N	0.88 W	504,517.25	726,520.42	0.21	2.92	32.73	
4,622.00	1.28	249.19	4,621.38	2.83 N	0.92 W	504,517.23	726,520.38	0.21	2.91	32.63	
4,624.00	1.28	249.30	4,623.38	2.82 N	0.96 W	504,517.22	726,520.34	0.21	2.90	32.53	
4,626.00	1.28	249.40	4,625.37	2.80 N	1.01 W	504,517.20	726,520.29	0.21	2.89	32.42	
4,628.00	1.29	249.50	4,627.37	2.78 N	1.05 W	504,517.18	726,520.25	0.21	2.88	32.32	
4,630.00	1.29	249.60	4,629.37	2.77 N	1.09 W	504,517.17	726,520.21	0.21	2.86	32.22	
4,632.00	1.29	249.70	4,631.37	2.75 N	1.13 W	504,517.15	726,520.17	0.21	2.85	32.12	
4,634.00	1.30	249.80	4,633.37	2.74 N	1.17 W	504,517.14	726,520.13	0.21	2.84	32.02	
4,636.00	1.30	249.89	4,635.37	2.72 N	1.22 W	504,517.12	726,520.08	0.21	2.83	31.93	
4,638.00	1.30	249.99	4,637.37	2.71 N	1.26 W	504,517.11	726,520.04	0.21	2.82	31.83	
4,640.00	1.31	250.09	4,639.37	2.69 N	1.30 W	504,517.09	726,520.00	0.21	2.81	31.73	
4,642.00	1.31	250.18	4,641.37	2.67 N	1.35 W	504,517.07	726,519.95	0.21	2.80	31.63	
4,644.00	1.32	250.28	4,643.37	2.66 N	1.39 W	504,517.06	726,519.91	0.21	2.79	31.54	
4,646.00	1.32	250.38	4,645.37	2.64 N	1.43 W	504,517.04	726,519.87	0.21	2.78	31.44	
4,648.00	1.32	250.47	4,647.37	2.63 N	1.48 W	504,517.03	726,519.82	0.21	2.76	31.34	
4,650.00	1.33	250.57	4,649.37	2.61 N	1.52 W	504,517.01	726,519.78	0.21	2.75	31.25	
4,652.00	1.33	250.66	4,651.37	2.60 N	1.56 W	504,517.00	726,519.74	0.21	2.74	31.16	
4,654.00	1.33	250.66	4,653.37	2.58 N	1.61 W	504,516.98	726,519.69	0.00	2.73	0.00	
4,656.00	1.33	250.66	4,655.37	2.57 N	1.65 W	504,516.97	726,519.65	0.00	2.72	0.00	
4,658.00	1.33	250.66	4,657.37	2.55 N	1.69 W	504,516.95	726,519.61	0.00	2.71	0.00	
4,660.00	1.33	250.66	4,659.37	2.54 N	1.74 W	504,516.94	726,519.56	0.00	2.70	0.00	
4,662.00	1.33	250.66	4,661.37	2.52 N	1.78 W	504,516.92	726,519.52	0.00	2.69	0.00	
4,664.00	1.34	250.76	4,663.36	2.51 N	1.83 W	504,516.91	726,519.47	0.28	2.68	24.50	
4,666.00	1.34	250.78	4,665.36	2.49 N	1.87 W	504,516.89	726,519.43	0.05	2.67	24.40	
4,668.00	1.34	250.79	4,667.36	2.47 N	1.91 W	504,516.87	726,519.39	0.05	2.66	24.38	
4,670.00	1.34	250.81	4,669.36	2.46 N	1.96 W	504,516.86	726,519.34	0.05	2.65	24.36	
4,672.00	1.34	250.83	4,671.36	2.44 N	2.00 W	504,516.84	726,519.30	0.05	2.63	24.35	
4,674.00	1.34	250.84	4,673.36	2.43 N	2.05 W	504,516.83	726,519.25	0.05	2.62	24.33	
4,676.00	1.34	250.86	4,675.36	2.41 N	2.09 W	504,516.81	726,519.21	0.05	2.61	24.31	
4,678.00	1.34	250.87	4,677.36	2.40 N	2.14 W	504,516.80	726,519.16	0.05	2.60	24.30	
4,680.00	1.34	250.89	4,679.36	2.38 N	2.18 W	504,516.78	726,519.12	0.05	2.59	24.28	
4,682.00	1.34	250.91	4,681.36	2.37 N	2.22 W	504,516.77	726,519.08	0.05	2.58	24.26	
4,684.00	1.34	250.92	4,683.36	2.35 N	2.27 W	504,516.75	726,519.03	0.05	2.57	24.25	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
4,686.00	1.34	250.94	4,685.36	2.34 N	2.31 W	504,516.74	726,518.99	0.05	2.56	24.23	
4,688.00	1.35	250.96	4,687.36	2.32 N	2.36 W	504,516.72	726,518.94	0.05	2.55	24.22	
4,690.00	1.35	250.97	4,689.36	2.31 N	2.40 W	504,516.71	726,518.90	0.05	2.54	24.20	
4,692.00	1.35	250.99	4,691.36	2.29 N	2.45 W	504,516.69	726,518.85	0.05	2.53	24.18	
4,694.00	1.35	251.01	4,693.36	2.28 N	2.49 W	504,516.68	726,518.81	0.05	2.52	24.17	
4,696.00	1.35	251.02	4,695.36	2.26 N	2.53 W	504,516.66	726,518.77	0.05	2.51	24.15	
4,698.00	1.35	251.04	4,697.36	2.24 N	2.58 W	504,516.64	726,518.72	0.05	2.49	24.13	
4,700.00	1.35	251.05	4,699.35	2.23 N	2.62 W	504,516.63	726,518.68	0.05	2.48	24.12	
4,702.00	1.35	251.07	4,701.35	2.21 N	2.67 W	504,516.61	726,518.63	0.05	2.47	24.10	
4,704.00	1.35	251.09	4,703.35	2.20 N	2.71 W	504,516.60	726,518.59	0.05	2.46	24.09	
4,706.00	1.35	251.10	4,705.35	2.18 N	2.76 W	504,516.58	726,518.54	0.05	2.45	24.07	
4,708.00	1.35	251.12	4,707.35	2.17 N	2.80 W	504,516.57	726,518.50	0.05	2.44	24.05	
4,710.00	1.35	251.13	4,709.35	2.15 N	2.85 W	504,516.55	726,518.45	0.05	2.43	24.04	
4,712.00	1.36	251.15	4,711.35	2.14 N	2.89 W	504,516.54	726,518.41	0.05	2.42	24.02	
4,714.00	1.36	251.17	4,713.35	2.12 N	2.94 W	504,516.52	726,518.36	0.05	2.41	24.01	
4,716.00	1.36	251.18	4,715.35	2.11 N	2.98 W	504,516.51	726,518.32	0.05	2.40	23.99	
4,718.00	1.36	251.20	4,717.35	2.09 N	3.03 W	504,516.49	726,518.27	0.05	2.39	23.97	
4,720.00	1.36	251.21	4,719.35	2.08 N	3.07 W	504,516.48	726,518.23	0.05	2.38	23.96	
4,722.00	1.36	251.23	4,721.35	2.06 N	3.12 W	504,516.46	726,518.18	0.05	2.37	23.94	
4,724.00	1.36	251.25	4,723.35	2.05 N	3.16 W	504,516.45	726,518.14	0.05	2.36	23.93	
4,726.00	1.36	251.26	4,725.35	2.03 N	3.21 W	504,516.43	726,518.09	0.05	2.34	23.91	
4,728.00	1.36	251.28	4,727.35	2.02 N	3.25 W	504,516.42	726,518.05	0.05	2.33	23.89	
4,730.00	1.36	251.29	4,729.35	2.00 N	3.30 W	504,516.40	726,518.00	0.05	2.32	23.88	
4,732.00	1.36	251.31	4,731.35	1.98 N	3.34 W	504,516.38	726,517.96	0.05	2.31	23.86	
4,734.00	1.36	251.33	4,733.35	1.97 N	3.39 W	504,516.37	726,517.91	0.05	2.30	23.85	
4,736.00	1.37	251.34	4,735.34	1.95 N	3.43 W	504,516.35	726,517.87	0.05	2.29	23.83	
4,738.00	1.37	251.36	4,737.34	1.94 N	3.48 W	504,516.34	726,517.82	0.05	2.28	23.81	
4,740.00	1.37	251.37	4,739.34	1.92 N	3.52 W	504,516.32	726,517.78	0.05	2.27	23.80	
4,742.00	1.37	251.39	4,741.34	1.91 N	3.57 W	504,516.31	726,517.73	0.05	2.26	23.78	
4,744.00	1.37	251.40	4,743.34	1.89 N	3.61 W	504,516.29	726,517.69	0.05	2.25	23.77	
4,746.00	1.37	251.42	4,745.34	1.88 N	3.66 W	504,516.28	726,517.64	0.05	2.24	23.75	
4,748.00	1.37	251.42	4,747.34	1.86 N	3.70 W	504,516.26	726,517.60	0.00	2.23	0.00	
4,750.00	1.36	251.41	4,749.34	1.85 N	3.75 W	504,516.25	726,517.55	0.46	2.22	-179.06	
4,752.00	1.36	251.41	4,751.34	1.83 N	3.79 W	504,516.23	726,517.51	0.23	2.21	-179.05	
4,754.00	1.35	251.41	4,753.34	1.82 N	3.84 W	504,516.22	726,517.46	0.23	2.20	-179.05	
4,756.00	1.35	251.40	4,755.34	1.80 N	3.88 W	504,516.20	726,517.42	0.23	2.19	-179.05	
4,758.00	1.34	251.40	4,757.34	1.79 N	3.93 W	504,516.19	726,517.37	0.23	2.18	-179.04	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

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				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
4,760.00	1.34	251.40	4,759.34	1.77 N	3.97 W	504,516.17	726,517.33	0.23	2.17	-179.04	
4,762.00	1.33	251.39	4,761.34	1.76 N	4.02 W	504,516.16	726,517.28	0.23	2.16	-179.04	
4,764.00	1.33	251.39	4,763.34	1.74 N	4.06 W	504,516.14	726,517.24	0.23	2.15	-179.03	
4,766.00	1.32	251.39	4,765.34	1.73 N	4.10 W	504,516.13	726,517.20	0.23	2.13	-179.03	
4,768.00	1.32	251.38	4,767.34	1.71 N	4.15 W	504,516.11	726,517.15	0.23	2.12	-179.03	
4,770.00	1.31	251.38	4,769.34	1.70 N	4.19 W	504,516.10	726,517.11	0.23	2.11	-179.02	
4,772.00	1.31	251.38	4,771.33	1.68 N	4.23 W	504,516.08	726,517.07	0.23	2.10	-179.02	
4,774.00	1.31	251.37	4,773.33	1.67 N	4.28 W	504,516.07	726,517.02	0.23	2.09	-179.02	
4,776.00	1.30	251.37	4,775.33	1.66 N	4.32 W	504,516.06	726,516.98	0.23	2.08	-179.01	
4,778.00	1.30	251.37	4,777.33	1.64 N	4.36 W	504,516.04	726,516.94	0.23	2.07	-179.01	
4,780.00	1.29	251.36	4,779.33	1.63 N	4.41 W	504,516.03	726,516.89	0.23	2.06	-179.01	
4,782.00	1.29	251.36	4,781.33	1.61 N	4.45 W	504,516.01	726,516.85	0.23	2.05	-179.00	
4,784.00	1.28	251.36	4,783.33	1.60 N	4.49 W	504,516.00	726,516.81	0.23	2.04	-179.00	
4,786.00	1.28	251.35	4,785.33	1.58 N	4.53 W	504,515.98	726,516.77	0.23	2.03	-178.99	
4,788.00	1.27	251.35	4,787.33	1.57 N	4.58 W	504,515.97	726,516.72	0.23	2.02	-178.99	
4,790.00	1.27	251.34	4,789.33	1.55 N	4.62 W	504,515.95	726,516.68	0.23	2.01	-178.99	
4,792.00	1.26	251.34	4,791.33	1.54 N	4.66 W	504,515.94	726,516.64	0.23	2.00	-178.98	
4,794.00	1.26	251.34	4,793.33	1.53 N	4.70 W	504,515.93	726,516.60	0.23	1.99	-178.98	
4,796.00	1.25	251.33	4,795.33	1.51 N	4.74 W	504,515.91	726,516.56	0.23	1.99	-178.98	
4,798.00	1.25	251.33	4,797.33	1.50 N	4.78 W	504,515.90	726,516.52	0.23	1.98	-178.97	
4,800.00	1.24	251.33	4,799.33	1.48 N	4.83 W	504,515.88	726,516.47	0.23	1.97	-178.97	
4,802.00	1.24	251.32	4,801.33	1.47 N	4.87 W	504,515.87	726,516.43	0.23	1.96	-178.96	
4,804.00	1.24	251.32	4,803.33	1.46 N	4.91 W	504,515.86	726,516.39	0.23	1.95	-178.96	
4,806.00	1.23	251.31	4,805.33	1.44 N	4.95 W	504,515.84	726,516.35	0.23	1.94	-178.96	
4,808.00	1.23	251.31	4,807.33	1.43 N	4.99 W	504,515.83	726,516.31	0.23	1.93	-178.95	
4,810.00	1.22	251.31	4,809.33	1.42 N	5.03 W	504,515.82	726,516.27	0.23	1.92	-178.95	
4,812.00	1.22	251.30	4,811.33	1.40 N	5.07 W	504,515.80	726,516.23	0.23	1.91	-178.95	
4,814.00	1.21	251.30	4,813.32	1.39 N	5.11 W	504,515.79	726,516.19	0.23	1.90	-178.94	
4,816.00	1.21	251.29	4,815.32	1.37 N	5.15 W	504,515.77	726,516.15	0.23	1.89	-178.94	
4,818.00	1.20	251.29	4,817.32	1.36 N	5.19 W	504,515.76	726,516.11	0.23	1.88	-178.93	
4,820.00	1.20	251.29	4,819.32	1.35 N	5.23 W	504,515.75	726,516.07	0.23	1.87	-178.93	
4,822.00	1.19	251.28	4,821.32	1.33 N	5.27 W	504,515.73	726,516.03	0.23	1.86	-178.92	
4,824.00	1.19	251.28	4,823.32	1.32 N	5.31 W	504,515.72	726,515.99	0.23	1.85	-178.92	
4,826.00	1.18	251.27	4,825.32	1.31 N	5.35 W	504,515.71	726,515.95	0.23	1.84	-178.92	
4,828.00	1.18	251.27	4,827.32	1.29 N	5.39 W	504,515.69	726,515.91	0.23	1.83	-178.91	
4,830.00	1.18	251.26	4,829.32	1.28 N	5.43 W	504,515.68	726,515.87	0.23	1.82	-178.91	
4,832.00	1.17	251.26	4,831.32	1.27 N	5.46 W	504,515.67	726,515.84	0.23	1.82	-178.90	



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Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
4,834.00	1.17	251.26	4,833.32	1.26 N	5.50 W	504,515.66	726,515.80	0.23	1.81	-178.90	
4,836.00	1.16	251.25	4,835.32	1.24 N	5.54 W	504,515.64	726,515.76	0.23	1.80	-178.89	
4,838.00	1.16	251.25	4,837.32	1.23 N	5.58 W	504,515.63	726,515.72	0.23	1.79	-178.89	
4,840.00	1.15	251.24	4,839.32	1.22 N	5.62 W	504,515.62	726,515.68	0.23	1.78	-178.89	
4,842.00	1.15	251.24	4,841.32	1.20 N	5.66 W	504,515.60	726,515.64	0.12	1.77	-178.88	
4,844.00	1.15	251.24	4,843.32	1.19 N	5.69 W	504,515.59	726,515.61	0.00	1.76	0.00	
4,846.00	1.14	251.18	4,845.32	1.18 N	5.73 W	504,515.58	726,515.57	0.37	1.75	-170.72	
4,848.00	1.14	251.16	4,847.32	1.16 N	5.77 W	504,515.56	726,515.53	0.15	1.74	-170.66	
4,850.00	1.14	251.13	4,849.32	1.15 N	5.81 W	504,515.55	726,515.49	0.15	1.73	-170.64	
4,852.00	1.13	251.11	4,851.32	1.14 N	5.84 W	504,515.54	726,515.46	0.15	1.73	-170.61	
4,854.00	1.13	251.08	4,853.32	1.13 N	5.88 W	504,515.53	726,515.42	0.15	1.72	-170.59	
4,856.00	1.13	251.06	4,855.32	1.11 N	5.92 W	504,515.51	726,515.38	0.15	1.71	-170.56	
4,858.00	1.12	251.03	4,857.32	1.10 N	5.96 W	504,515.50	726,515.34	0.15	1.70	-170.54	
4,860.00	1.12	251.01	4,859.32	1.09 N	5.99 W	504,515.49	726,515.31	0.15	1.69	-170.51	
4,862.00	1.12	250.98	4,861.31	1.08 N	6.03 W	504,515.48	726,515.27	0.15	1.68	-170.49	
4,864.00	1.12	250.96	4,863.31	1.06 N	6.07 W	504,515.46	726,515.23	0.15	1.67	-170.46	
4,866.00	1.11	250.93	4,865.31	1.05 N	6.10 W	504,515.45	726,515.20	0.15	1.66	-170.44	
4,868.00	1.11	250.90	4,867.31	1.04 N	6.14 W	504,515.44	726,515.16	0.15	1.65	-170.41	
4,870.00	1.11	250.88	4,869.31	1.02 N	6.18 W	504,515.42	726,515.12	0.15	1.64	-170.39	
4,872.00	1.10	250.85	4,871.31	1.01 N	6.21 W	504,515.41	726,515.09	0.15	1.64	-170.36	
4,874.00	1.10	250.83	4,873.31	1.00 N	6.25 W	504,515.40	726,515.05	0.15	1.63	-170.33	
4,876.00	1.10	250.80	4,875.31	0.99 N	6.29 W	504,515.39	726,515.01	0.15	1.62	-170.31	
4,878.00	1.10	250.77	4,877.31	0.97 N	6.32 W	504,515.37	726,514.98	0.15	1.61	-170.28	
4,880.00	1.09	250.75	4,879.31	0.96 N	6.36 W	504,515.36	726,514.94	0.15	1.60	-170.26	
4,882.00	1.09	250.72	4,881.31	0.95 N	6.39 W	504,515.35	726,514.91	0.15	1.59	-170.23	
4,884.00	1.09	250.69	4,883.31	0.94 N	6.43 W	504,515.34	726,514.87	0.15	1.58	-170.20	
4,886.00	1.08	250.67	4,885.31	0.92 N	6.47 W	504,515.32	726,514.83	0.15	1.57	-170.18	
4,888.00	1.08	250.64	4,887.31	0.91 N	6.50 W	504,515.31	726,514.80	0.15	1.56	-170.15	
4,890.00	1.08	250.61	4,889.31	0.90 N	6.54 W	504,515.30	726,514.76	0.15	1.56	-170.12	
4,892.00	1.07	250.58	4,891.31	0.89 N	6.57 W	504,515.29	726,514.73	0.15	1.55	-170.09	
4,894.00	1.07	250.56	4,893.31	0.87 N	6.61 W	504,515.27	726,514.69	0.15	1.54	-170.07	
4,896.00	1.07	250.53	4,895.31	0.86 N	6.64 W	504,515.26	726,514.66	0.15	1.53	-170.04	
4,898.00	1.07	250.50	4,897.31	0.85 N	6.68 W	504,515.25	726,514.62	0.15	1.52	-170.01	
4,900.00	1.06	250.47	4,899.31	0.84 N	6.71 W	504,515.24	726,514.59	0.15	1.51	-169.98	
4,902.00	1.06	250.44	4,901.31	0.82 N	6.75 W	504,515.22	726,514.55	0.15	1.50	-169.96	
4,904.00	1.06	250.42	4,903.31	0.81 N	6.78 W	504,515.21	726,514.52	0.15	1.49	-169.93	

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Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
4,906.00	1.05	250.39	4,905.31	0.80 N	6.82 W	504,515.20	726,514.48	0.15	1.49	-169.90	
4,908.00	1.05	250.36	4,907.31	0.79 N	6.85 W	504,515.19	726,514.45	0.15	1.48	-169.87	
4,910.00	1.05	250.33	4,909.31	0.77 N	6.89 W	504,515.17	726,514.41	0.15	1.47	-169.84	
4,912.00	1.05	250.30	4,911.31	0.76 N	6.92 W	504,515.16	726,514.38	0.15	1.46	-169.81	
4,914.00	1.04	250.27	4,913.31	0.75 N	6.96 W	504,515.15	726,514.34	0.15	1.45	-169.78	
4,916.00	1.04	250.24	4,915.31	0.74 N	6.99 W	504,515.14	726,514.31	0.15	1.44	-169.75	
4,918.00	1.04	250.21	4,917.30	0.73 N	7.02 W	504,515.13	726,514.28	0.15	1.43	-169.72	
4,920.00	1.03	250.18	4,919.30	0.71 N	7.06 W	504,515.11	726,514.24	0.15	1.42	-169.70	
4,922.00	1.03	250.15	4,921.30	0.70 N	7.09 W	504,515.10	726,514.21	0.15	1.42	-169.67	
4,924.00	1.03	250.12	4,923.30	0.69 N	7.13 W	504,515.09	726,514.17	0.15	1.41	-169.64	
4,926.00	1.02	250.09	4,925.30	0.68 N	7.16 W	504,515.08	726,514.14	0.15	1.40	-169.61	
4,928.00	1.02	250.06	4,927.30	0.66 N	7.19 W	504,515.06	726,514.11	0.15	1.39	-169.58	
4,930.00	1.02	250.03	4,929.30	0.65 N	7.23 W	504,515.05	726,514.07	0.15	1.38	-169.55	
4,932.00	1.02	250.00	4,931.30	0.64 N	7.26 W	504,515.04	726,514.04	0.15	1.37	-169.51	
4,934.00	1.01	249.97	4,933.30	0.63 N	7.29 W	504,515.03	726,514.01	0.15	1.36	-169.48	
4,936.00	1.01	249.94	4,935.30	0.62 N	7.33 W	504,515.02	726,513.97	0.15	1.35	-169.45	
4,938.00	1.01	249.94	4,937.30	0.60 N	7.36 W	504,515.00	726,513.94	0.00	1.35	0.00	
4,940.00	1.01	250.26	4,939.30	0.59 N	7.39 W	504,514.99	726,513.91	0.28	1.34	93.79	
4,942.00	1.01	250.42	4,941.30	0.58 N	7.43 W	504,514.98	726,513.87	0.14	1.33	93.47	
4,944.00	1.01	250.58	4,943.30	0.57 N	7.46 W	504,514.97	726,513.84	0.14	1.32	93.31	
4,946.00	1.01	250.75	4,945.30	0.56 N	7.49 W	504,514.96	726,513.81	0.14	1.31	93.15	
4,948.00	1.01	250.91	4,947.30	0.55 N	7.53 W	504,514.95	726,513.77	0.14	1.30	92.99	
4,950.00	1.01	251.07	4,949.30	0.53 N	7.56 W	504,514.93	726,513.74	0.14	1.30	92.83	
4,952.00	1.01	251.23	4,951.30	0.52 N	7.59 W	504,514.92	726,513.71	0.14	1.29	92.67	
4,954.00	1.01	251.39	4,953.30	0.51 N	7.63 W	504,514.91	726,513.67	0.14	1.28	92.50	
4,956.00	1.01	251.55	4,955.30	0.50 N	7.66 W	504,514.90	726,513.64	0.14	1.27	92.34	
4,958.00	1.01	251.71	4,957.30	0.49 N	7.69 W	504,514.89	726,513.61	0.14	1.27	92.18	
4,960.00	1.01	251.88	4,959.30	0.48 N	7.73 W	504,514.88	726,513.57	0.14	1.26	92.02	
4,962.00	1.01	252.04	4,961.30	0.47 N	7.76 W	504,514.87	726,513.54	0.14	1.25	91.86	
4,964.00	1.01	252.20	4,963.30	0.46 N	7.79 W	504,514.86	726,513.51	0.14	1.24	91.70	
4,966.00	1.01	252.36	4,965.30	0.45 N	7.83 W	504,514.85	726,513.47	0.14	1.24	91.54	
4,968.00	1.01	252.52	4,967.30	0.43 N	7.86 W	504,514.83	726,513.44	0.14	1.23	91.37	
4,970.00	1.01	252.68	4,969.30	0.42 N	7.89 W	504,514.82	726,513.41	0.14	1.22	91.21	
4,972.00	1.01	252.85	4,971.30	0.41 N	7.93 W	504,514.81	726,513.37	0.14	1.21	91.05	
4,974.00	1.01	253.01	4,973.30	0.40 N	7.96 W	504,514.80	726,513.34	0.14	1.21	90.89	
4,976.00	1.01	253.17	4,975.30	0.39 N	7.99 W	504,514.79	726,513.31	0.14	1.20	90.73	
4,978.00	1.01	253.33	4,977.30	0.38 N	8.03 W	504,514.78	726,513.27	0.14	1.19	90.57	

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				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
4,980.00	1.01	253.49	4,979.30	0.37 N	8.06 W	504,514.77	726,513.24	0.14	1.19	90.40	
4,982.00	1.01	253.65	4,981.29	0.36 N	8.10 W	504,514.76	726,513.20	0.14	1.18	90.24	
4,984.00	1.01	253.82	4,983.29	0.35 N	8.13 W	504,514.75	726,513.17	0.14	1.17	90.08	
4,986.00	1.01	253.98	4,985.29	0.34 N	8.16 W	504,514.74	726,513.14	0.14	1.17	89.92	
4,988.00	1.01	254.14	4,987.29	0.33 N	8.20 W	504,514.73	726,513.10	0.14	1.16	89.76	
4,990.00	1.01	254.30	4,989.29	0.32 N	8.23 W	504,514.72	726,513.07	0.14	1.16	89.60	
4,992.00	1.01	254.46	4,991.29	0.31 N	8.26 W	504,514.71	726,513.04	0.14	1.15	89.43	
4,994.00	1.01	254.62	4,993.29	0.31 N	8.30 W	504,514.71	726,513.00	0.14	1.14	89.27	
4,996.00	1.01	254.79	4,995.29	0.30 N	8.33 W	504,514.70	726,512.97	0.14	1.14	89.11	
4,998.00	1.01	254.95	4,997.29	0.29 N	8.37 W	504,514.69	726,512.93	0.14	1.13	88.95	
5,000.00	1.01	255.11	4,999.29	0.28 N	8.40 W	504,514.68	726,512.90	0.14	1.13	88.79	
5,002.00	1.01	255.27	5,001.29	0.27 N	8.43 W	504,514.67	726,512.87	0.14	1.12	88.63	
5,004.00	1.01	255.43	5,003.29	0.26 N	8.47 W	504,514.66	726,512.83	0.14	1.12	88.46	
5,006.00	1.01	255.59	5,005.29	0.25 N	8.50 W	504,514.65	726,512.80	0.14	1.11	88.30	
5,008.00	1.01	255.76	5,007.29	0.24 N	8.54 W	504,514.64	726,512.76	0.14	1.11	88.14	
5,010.00	1.01	255.92	5,009.29	0.23 N	8.57 W	504,514.63	726,512.73	0.14	1.10	87.98	
5,012.00	1.01	256.08	5,011.29	0.23 N	8.60 W	504,514.63	726,512.70	0.14	1.10	87.82	
5,014.00	1.01	256.24	5,013.29	0.22 N	8.64 W	504,514.62	726,512.66	0.14	1.09	87.66	
5,016.00	1.01	256.40	5,015.29	0.21 N	8.67 W	504,514.61	726,512.63	0.14	1.09	87.50	
5,018.00	1.01	256.56	5,017.29	0.20 N	8.71 W	504,514.60	726,512.59	0.14	1.08	87.33	
5,020.00	1.01	256.72	5,019.29	0.19 N	8.74 W	504,514.59	726,512.56	0.14	1.08	87.17	
5,022.00	1.01	256.89	5,021.29	0.18 N	8.78 W	504,514.58	726,512.52	0.14	1.07	87.01	
5,024.00	1.01	257.05	5,023.29	0.18 N	8.81 W	504,514.58	726,512.49	0.14	1.07	86.85	
5,026.00	1.01	257.21	5,025.29	0.17 N	8.84 W	504,514.57	726,512.46	0.14	1.06	86.69	
5,028.00	1.01	257.37	5,027.29	0.16 N	8.88 W	504,514.56	726,512.42	0.14	1.06	86.53	
5,030.00	1.01	257.53	5,029.29	0.15 N	8.91 W	504,514.55	726,512.39	0.14	1.05	86.37	
5,032.00	1.01	257.53	5,031.29	0.15 N	8.95 W	504,514.55	726,512.35	0.00	1.05	0.00	
5,034.00	1.01	257.82	5,033.29	0.14 N	8.98 W	504,514.54	726,512.32	0.27	1.05	111.63	
5,036.00	1.01	257.96	5,035.29	0.13 N	9.02 W	504,514.53	726,512.28	0.14	1.04	111.34	
5,038.00	1.01	258.10	5,037.29	0.12 N	9.05 W	504,514.52	726,512.25	0.14	1.04	111.20	
5,040.00	1.01	258.25	5,039.29	0.12 N	9.09 W	504,514.52	726,512.21	0.14	1.04	111.05	
5,042.00	1.00	258.39	5,041.29	0.11 N	9.12 W	504,514.51	726,512.18	0.14	1.03	110.91	
5,044.00	1.00	258.54	5,043.29	0.10 N	9.15 W	504,514.50	726,512.15	0.14	1.03	110.76	
5,046.00	1.00	258.68	5,045.29	0.10 N	9.19 W	504,514.50	726,512.11	0.14	1.02	110.62	
5,048.00	1.00	258.83	5,047.28	0.09 N	9.22 W	504,514.49	726,512.08	0.14	1.02	110.47	
5,050.00	1.00	258.97	5,049.28	0.08 N	9.26 W	504,514.48	726,512.04	0.14	1.02	110.33	
5,052.00	1.00	259.12	5,051.28	0.07 N	9.29 W	504,514.47	726,512.01	0.14	1.02	110.18	



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Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
5,054.00	1.00	259.26	5,053.28	0.07 N	9.33 W	504,514.47	726,511.97	0.14	1.01	110.04	
5,056.00	1.00	259.41	5,055.28	0.06 N	9.36 W	504,514.46	726,511.94	0.14	1.01	109.89	
5,058.00	1.00	259.56	5,057.28	0.06 N	9.39 W	504,514.46	726,511.91	0.14	1.01	109.75	
5,060.00	1.00	259.70	5,059.28	0.05 N	9.43 W	504,514.45	726,511.87	0.14	1.00	109.60	
5,062.00	0.99	259.85	5,061.28	0.04 N	9.46 W	504,514.44	726,511.84	0.14	1.00	109.45	
5,064.00	0.99	260.00	5,063.28	0.04 N	9.50 W	504,514.44	726,511.80	0.14	1.00	109.31	
5,066.00	0.99	260.14	5,065.28	0.03 N	9.53 W	504,514.43	726,511.77	0.14	1.00	109.16	
5,068.00	0.99	260.29	5,067.28	0.03 N	9.56 W	504,514.43	726,511.74	0.14	0.99	109.01	
5,070.00	0.99	260.44	5,069.28	0.02 N	9.60 W	504,514.42	726,511.70	0.14	0.99	108.86	
5,072.00	0.99	260.59	5,071.28	0.01 N	9.63 W	504,514.41	726,511.67	0.14	0.99	108.71	
5,074.00	0.99	260.74	5,073.28	0.01 N	9.67 W	504,514.41	726,511.63	0.14	0.99	108.57	
5,076.00	0.99	260.89	5,075.28	0.00 N	9.70 W	504,514.40	726,511.60	0.14	0.98	108.42	
5,078.00	0.99	261.04	5,077.28	0.00 S	9.74 W	504,514.40	726,511.56	0.14	0.98	108.27	
5,080.00	0.99	261.19	5,079.28	0.01 S	9.77 W	504,514.39	726,511.53	0.14	0.98	108.12	
5,082.00	0.99	261.33	5,081.28	0.01 S	9.80 W	504,514.39	726,511.50	0.14	0.98	107.97	
5,084.00	0.99	261.48	5,083.28	0.02 S	9.84 W	504,514.38	726,511.46	0.14	0.98	107.82	
5,086.00	0.98	261.63	5,085.28	0.02 S	9.87 W	504,514.38	726,511.43	0.14	0.98	107.67	
5,088.00	0.98	261.79	5,087.28	0.03 S	9.91 W	504,514.37	726,511.39	0.14	0.97	107.52	
5,090.00	0.98	261.94	5,089.28	0.03 S	9.94 W	504,514.37	726,511.36	0.14	0.97	107.37	
5,092.00	0.98	262.09	5,091.28	0.04 S	9.97 W	504,514.36	726,511.33	0.14	0.97	107.22	
5,094.00	0.98	262.24	5,093.28	0.04 S	10.01 W	504,514.36	726,511.29	0.14	0.97	107.07	
5,096.00	0.98	262.39	5,095.28	0.05 S	10.04 W	504,514.35	726,511.26	0.14	0.97	106.92	
5,098.00	0.98	262.54	5,097.28	0.05 S	10.07 W	504,514.35	726,511.23	0.14	0.97	106.77	
5,100.00	0.98	262.69	5,099.28	0.06 S	10.11 W	504,514.34	726,511.19	0.14	0.97	106.62	
5,102.00	0.98	262.84	5,101.28	0.06 S	10.14 W	504,514.34	726,511.16	0.14	0.97	106.46	
5,104.00	0.98	263.00	5,103.28	0.06 S	10.18 W	504,514.34	726,511.12	0.14	0.97	106.31	
5,106.00	0.98	263.15	5,105.28	0.07 S	10.21 W	504,514.33	726,511.09	0.14	0.97	106.16	
5,108.00	0.98	263.30	5,107.28	0.07 S	10.24 W	504,514.33	726,511.06	0.14	0.96	106.01	
5,110.00	0.98	263.46	5,109.28	0.08 S	10.28 W	504,514.32	726,511.02	0.14	0.96	105.85	
5,112.00	0.97	263.61	5,111.28	0.08 S	10.31 W	504,514.32	726,510.99	0.14	0.96	105.70	
5,114.00	0.97	263.76	5,113.27	0.08 S	10.35 W	504,514.32	726,510.95	0.14	0.96	105.55	
5,116.00	0.97	263.92	5,115.27	0.09 S	10.38 W	504,514.31	726,510.92	0.14	0.96	105.39	
5,118.00	0.97	264.07	5,117.27	0.09 S	10.41 W	504,514.31	726,510.89	0.14	0.96	105.24	
5,120.00	0.97	264.22	5,119.27	0.10 S	10.45 W	504,514.30	726,510.85	0.14	0.96	105.09	
5,122.00	0.97	264.38	5,121.27	0.10 S	10.48 W	504,514.30	726,510.82	0.14	0.96	104.93	
5,124.00	0.97	264.53	5,123.27	0.10 S	10.51 W	504,514.30	726,510.79	0.14	0.96	104.78	



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Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
5,126.00	0.97	264.61	5,125.27	0.10 S	10.55 W	504,514.30	726,510.75	0.07	0.96	104.62	
5,128.00	0.97	264.61	5,127.27	0.11 S	10.58 W	504,514.29	726,510.72	0.00	0.96	0.00	
5,130.00	0.98	264.44	5,129.27	0.11 S	10.62 W	504,514.29	726,510.68	0.42	0.96	-20.07	
5,132.00	0.98	264.38	5,131.27	0.11 S	10.65 W	504,514.29	726,510.65	0.17	0.96	-19.90	
5,134.00	0.98	264.31	5,133.27	0.12 S	10.68 W	504,514.28	726,510.62	0.17	0.96	-19.83	
5,136.00	0.99	264.24	5,135.27	0.12 S	10.72 W	504,514.28	726,510.58	0.17	0.96	-19.77	
5,138.00	0.99	264.18	5,137.27	0.13 S	10.75 W	504,514.27	726,510.55	0.17	0.96	-19.70	
5,140.00	0.99	264.12	5,139.27	0.13 S	10.79 W	504,514.27	726,510.51	0.17	0.96	-19.64	
5,142.00	1.00	264.05	5,141.27	0.13 S	10.82 W	504,514.27	726,510.48	0.17	0.96	-19.57	
5,144.00	1.00	263.99	5,143.27	0.14 S	10.86 W	504,514.26	726,510.44	0.17	0.96	-19.51	
5,146.00	1.00	263.92	5,145.27	0.14 S	10.89 W	504,514.26	726,510.41	0.17	0.96	-19.45	
5,148.00	1.01	263.86	5,147.27	0.14 S	10.93 W	504,514.26	726,510.37	0.17	0.96	-19.38	
5,150.00	1.01	263.80	5,149.27	0.15 S	10.96 W	504,514.25	726,510.34	0.17	0.96	-19.32	
5,152.00	1.01	263.74	5,151.27	0.15 S	11.00 W	504,514.25	726,510.30	0.17	0.96	-19.26	
5,154.00	1.02	263.67	5,153.27	0.15 S	11.03 W	504,514.25	726,510.27	0.17	0.96	-19.20	
5,156.00	1.02	263.61	5,155.27	0.16 S	11.07 W	504,514.24	726,510.23	0.17	0.96	-19.13	
5,158.00	1.02	263.55	5,157.27	0.16 S	11.10 W	504,514.24	726,510.20	0.17	0.96	-19.07	
5,160.00	1.02	263.49	5,159.27	0.17 S	11.14 W	504,514.23	726,510.16	0.17	0.96	-19.01	
5,162.00	1.03	263.43	5,161.27	0.17 S	11.17 W	504,514.23	726,510.13	0.17	0.96	-18.95	
5,164.00	1.03	263.37	5,163.27	0.17 S	11.21 W	504,514.23	726,510.09	0.17	0.96	-18.89	
5,166.00	1.03	263.31	5,165.27	0.18 S	11.24 W	504,514.22	726,510.06	0.17	0.96	-18.83	
5,168.00	1.04	263.25	5,167.27	0.18 S	11.28 W	504,514.22	726,510.02	0.17	0.96	-18.77	
5,170.00	1.04	263.19	5,169.27	0.19 S	11.32 W	504,514.21	726,509.98	0.17	0.96	-18.71	
5,172.00	1.04	263.13	5,171.27	0.19 S	11.35 W	504,514.21	726,509.95	0.17	0.96	-18.65	
5,174.00	1.05	263.08	5,173.27	0.20 S	11.39 W	504,514.20	726,509.91	0.17	0.96	-18.59	
5,176.00	1.05	263.02	5,175.27	0.20 S	11.43 W	504,514.20	726,509.87	0.17	0.96	-18.54	
5,178.00	1.05	262.96	5,177.27	0.21 S	11.46 W	504,514.19	726,509.84	0.17	0.96	-18.48	
5,180.00	1.06	262.90	5,179.26	0.21 S	11.50 W	504,514.19	726,509.80	0.17	0.96	-18.42	
5,182.00	1.06	262.85	5,181.26	0.21 S	11.53 W	504,514.19	726,509.77	0.17	0.95	-18.36	
5,184.00	1.06	262.79	5,183.26	0.22 S	11.57 W	504,514.18	726,509.73	0.17	0.95	-18.31	
5,186.00	1.07	262.74	5,185.26	0.22 S	11.61 W	504,514.18	726,509.69	0.17	0.95	-18.25	
5,188.00	1.07	262.68	5,187.26	0.23 S	11.65 W	504,514.17	726,509.65	0.17	0.95	-18.19	
5,190.00	1.07	262.62	5,189.26	0.23 S	11.68 W	504,514.17	726,509.62	0.17	0.95	-18.14	
5,192.00	1.08	262.57	5,191.26	0.24 S	11.72 W	504,514.16	726,509.58	0.17	0.95	-18.08	
5,194.00	1.08	262.51	5,193.26	0.24 S	11.76 W	504,514.16	726,509.54	0.17	0.95	-18.03	
5,196.00	1.08	262.46	5,195.26	0.25 S	11.79 W	504,514.15	726,509.51	0.17	0.95	-17.97	
5,198.00	1.09	262.41	5,197.26	0.25 S	11.83 W	504,514.15	726,509.47	0.17	0.95	-17.92	

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Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
5,200.00	1.09	262.35	5,199.26	0.26 S	11.87 W	504,514.14	726,509.43	0.17	0.95	-17.86	
5,202.00	1.09	262.30	5,201.26	0.26 S	11.91 W	504,514.14	726,509.39	0.17	0.94	-17.81	
5,204.00	1.09	262.24	5,203.26	0.27 S	11.94 W	504,514.13	726,509.36	0.17	0.94	-17.76	
5,206.00	1.10	262.19	5,205.26	0.27 S	11.98 W	504,514.13	726,509.32	0.17	0.94	-17.70	
5,208.00	1.10	262.14	5,207.26	0.28 S	12.02 W	504,514.12	726,509.28	0.17	0.94	-17.65	
5,210.00	1.10	262.09	5,209.26	0.28 S	12.06 W	504,514.12	726,509.24	0.17	0.94	-17.60	
5,212.00	1.11	262.04	5,211.26	0.29 S	12.10 W	504,514.11	726,509.20	0.17	0.94	-17.55	
5,214.00	1.11	261.98	5,213.26	0.29 S	12.14 W	504,514.11	726,509.16	0.17	0.94	-17.49	
5,216.00	1.11	261.93	5,215.26	0.30 S	12.17 W	504,514.10	726,509.13	0.17	0.93	-17.44	
5,218.00	1.12	261.88	5,217.26	0.31 S	12.21 W	504,514.09	726,509.09	0.17	0.93	-17.39	
5,220.00	1.12	261.83	5,219.26	0.31 S	12.25 W	504,514.09	726,509.05	0.17	0.93	-17.34	
5,222.00	1.14	261.30	5,221.26	0.32 S	12.29 W	504,514.08	726,509.01	1.08	0.93	-29.16	
5,224.00	1.16	260.79	5,223.26	0.32 S	12.33 W	504,514.08	726,508.97	1.08	0.93	-28.63	
5,226.00	1.18	260.29	5,225.26	0.33 S	12.37 W	504,514.07	726,508.93	1.08	0.92	-28.11	
5,228.00	1.20	259.81	5,227.26	0.34 S	12.41 W	504,514.06	726,508.89	1.08	0.92	-27.61	
5,230.00	1.22	259.34	5,229.26	0.34 S	12.45 W	504,514.06	726,508.85	1.08	0.92	-27.13	
5,232.00	1.24	258.89	5,231.26	0.35 S	12.49 W	504,514.05	726,508.81	1.08	0.91	-26.67	
5,234.00	1.25	258.45	5,233.25	0.36 S	12.54 W	504,514.04	726,508.76	1.08	0.91	-26.22	
5,236.00	1.27	258.03	5,235.25	0.37 S	12.58 W	504,514.03	726,508.72	1.08	0.91	-25.78	
5,238.00	1.29	257.62	5,237.25	0.38 S	12.62 W	504,514.02	726,508.68	1.08	0.90	-25.36	
5,240.00	1.31	257.22	5,239.25	0.39 S	12.67 W	504,514.01	726,508.63	1.08	0.90	-24.95	
5,242.00	1.33	256.83	5,241.25	0.40 S	12.71 W	504,514.00	726,508.59	1.08	0.89	-24.55	
5,244.00	1.35	256.46	5,243.25	0.41 S	12.76 W	504,513.99	726,508.54	1.08	0.88	-24.16	
5,246.00	1.37	256.09	5,245.25	0.42 S	12.80 W	504,513.98	726,508.50	1.08	0.88	-23.79	
5,248.00	1.39	255.74	5,247.25	0.43 S	12.85 W	504,513.97	726,508.45	1.08	0.87	-23.42	
5,250.00	1.41	255.39	5,249.25	0.45 S	12.90 W	504,513.95	726,508.40	1.08	0.86	-23.07	
5,252.00	1.43	255.06	5,251.25	0.46 S	12.95 W	504,513.94	726,508.35	1.08	0.85	-22.72	
5,254.00	1.45	254.73	5,253.25	0.47 S	13.00 W	504,513.93	726,508.30	1.08	0.85	-22.39	
5,256.00	1.47	254.42	5,255.25	0.49 S	13.04 W	504,513.91	726,508.26	1.08	0.84	-22.06	
5,258.00	1.49	254.11	5,257.25	0.50 S	13.09 W	504,513.90	726,508.21	1.08	0.83	-21.75	
5,260.00	1.51	253.81	5,259.25	0.51 S	13.15 W	504,513.89	726,508.15	1.08	0.82	-21.44	
5,262.00	1.53	253.52	5,261.25	0.53 S	13.20 W	504,513.87	726,508.10	1.08	0.81	-21.14	
5,264.00	1.55	253.23	5,263.25	0.54 S	13.25 W	504,513.86	726,508.05	1.08	0.80	-20.85	
5,266.00	1.57	252.96	5,265.24	0.56 S	13.30 W	504,513.84	726,508.00	1.08	0.79	-20.56	
5,268.00	1.59	252.69	5,267.24	0.58 S	13.35 W	504,513.82	726,507.95	1.08	0.78	-20.29	
5,270.00	1.61	252.42	5,269.24	0.59 S	13.41 W	504,513.81	726,507.89	1.08	0.77	-20.02	
5,272.00	1.64	252.17	5,271.24	0.61 S	13.46 W	504,513.79	726,507.84	1.08	0.76	-19.75	



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				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
5,274.00	1.66	251.92	5,273.24	0.63 S	13.51 W	504,513.77	726,507.79	1.08	0.74	-19.50	
5,276.00	1.68	251.67	5,275.24	0.65 S	13.57 W	504,513.75	726,507.73	1.08	0.73	-19.25	
5,278.00	1.70	251.43	5,277.24	0.66 S	13.63 W	504,513.74	726,507.67	1.08	0.72	-19.00	
5,280.00	1.72	251.20	5,279.24	0.68 S	13.68 W	504,513.72	726,507.62	1.08	0.71	-18.76	
5,282.00	1.74	250.97	5,281.24	0.70 S	13.74 W	504,513.70	726,507.56	1.08	0.69	-18.53	
5,284.00	1.76	250.75	5,283.24	0.72 S	13.80 W	504,513.68	726,507.50	1.08	0.68	-18.30	
5,286.00	1.78	250.54	5,285.24	0.74 S	13.86 W	504,513.66	726,507.44	1.08	0.66	-18.08	
5,288.00	1.80	250.32	5,287.24	0.76 S	13.91 W	504,513.64	726,507.39	1.08	0.65	-17.87	
5,290.00	1.82	250.12	5,289.23	0.79 S	13.97 W	504,513.61	726,507.33	1.08	0.63	-17.65	
5,292.00	1.84	249.92	5,291.23	0.81 S	14.03 W	504,513.59	726,507.27	1.08	0.62	-17.45	
5,294.00	1.86	249.72	5,293.23	0.83 S	14.09 W	504,513.57	726,507.21	1.08	0.60	-17.25	
5,296.00	1.88	249.52	5,295.23	0.85 S	14.16 W	504,513.55	726,507.14	1.08	0.58	-17.05	
5,298.00	1.90	249.34	5,297.23	0.88 S	14.22 W	504,513.52	726,507.08	1.08	0.57	-16.85	
5,300.00	1.92	249.15	5,299.23	0.90 S	14.28 W	504,513.50	726,507.02	1.08	0.55	-16.67	
5,302.00	1.94	248.97	5,301.23	0.92 S	14.34 W	504,513.48	726,506.96	1.08	0.53	-16.48	
5,304.00	1.97	248.79	5,303.23	0.95 S	14.41 W	504,513.45	726,506.89	1.08	0.52	-16.30	
5,306.00	1.99	248.62	5,305.23	0.97 S	14.47 W	504,513.43	726,506.83	1.08	0.50	-16.12	
5,308.00	2.01	248.45	5,307.22	1.00 S	14.54 W	504,513.40	726,506.76	1.08	0.48	-15.95	
5,310.00	2.03	248.28	5,309.22	1.03 S	14.60 W	504,513.37	726,506.70	1.08	0.46	-15.78	
5,312.00	2.05	248.12	5,311.22	1.05 S	14.67 W	504,513.35	726,506.63	1.08	0.44	-15.61	
5,314.00	2.07	247.96	5,313.22	1.08 S	14.73 W	504,513.32	726,506.57	1.08	0.42	-15.45	
5,316.00	2.11	247.72	5,315.22	1.11 S	14.80 W	504,513.29	726,506.50	1.93	0.40	-13.09	
5,318.00	2.16	247.41	5,317.22	1.13 S	14.87 W	504,513.27	726,506.43	2.78	0.38	-12.00	
5,320.00	2.22	247.12	5,319.22	1.16 S	14.94 W	504,513.24	726,506.36	2.78	0.36	-11.69	
5,322.00	2.27	246.84	5,321.21	1.19 S	15.01 W	504,513.21	726,506.29	2.78	0.33	-11.40	
5,324.00	2.33	246.58	5,323.21	1.23 S	15.09 W	504,513.17	726,506.21	2.78	0.31	-11.12	
5,326.00	2.38	246.33	5,325.21	1.26 S	15.16 W	504,513.14	726,506.14	2.78	0.28	-10.86	
5,328.00	2.43	246.09	5,327.21	1.29 S	15.24 W	504,513.11	726,506.06	2.78	0.26	-10.61	
5,330.00	2.49	245.86	5,329.21	1.33 S	15.32 W	504,513.07	726,505.98	2.78	0.23	-10.36	
5,332.00	2.54	245.64	5,331.21	1.36 S	15.40 W	504,513.04	726,505.90	2.78	0.20	-10.13	
5,334.00	2.60	245.42	5,333.20	1.40 S	15.48 W	504,513.00	726,505.82	2.78	0.17	-9.91	
5,336.00	2.65	245.22	5,335.20	1.44 S	15.56 W	504,512.96	726,505.74	2.78	0.14	-9.70	
5,338.00	2.71	245.03	5,337.20	1.48 S	15.65 W	504,512.92	726,505.65	2.78	0.11	-9.50	
5,340.00	2.76	244.84	5,339.20	1.52 S	15.73 W	504,512.88	726,505.57	2.78	0.08	-9.31	
5,342.00	2.82	244.66	5,341.19	1.56 S	15.82 W	504,512.84	726,505.48	2.78	0.05	-9.12	
5,344.00	2.87	244.49	5,343.19	1.60 S	15.91 W	504,512.80	726,505.39	2.78	0.02	-8.94	

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				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
5,346.00	2.93	244.32	5,345.19	1.65 S	16.00 W	504,512.75	726,505.30	2.78	-0.02	-8.77	
5,348.00	2.98	244.16	5,347.19	1.69 S	16.10 W	504,512.71	726,505.20	2.78	-0.05	-8.60	
5,350.00	3.04	244.01	5,349.18	1.74 S	16.19 W	504,512.66	726,505.11	2.78	-0.09	-8.44	
5,352.00	3.09	243.86	5,351.18	1.78 S	16.29 W	504,512.62	726,505.01	2.78	-0.13	-8.29	
5,354.00	3.15	243.72	5,353.18	1.83 S	16.38 W	504,512.57	726,504.92	2.78	-0.16	-8.14	
5,356.00	3.20	243.58	5,355.18	1.88 S	16.48 W	504,512.52	726,504.82	2.78	-0.20	-8.00	
5,358.00	3.26	243.44	5,357.17	1.93 S	16.58 W	504,512.47	726,504.72	2.78	-0.24	-7.86	
5,360.00	3.31	243.31	5,359.17	1.98 S	16.69 W	504,512.42	726,504.61	2.78	-0.28	-7.73	
5,362.00	3.37	243.19	5,361.17	2.04 S	16.79 W	504,512.36	726,504.51	2.78	-0.33	-7.60	
5,364.00	3.43	243.07	5,363.16	2.09 S	16.90 W	504,512.31	726,504.40	2.78	-0.37	-7.47	
5,366.00	3.48	242.95	5,365.16	2.14 S	17.00 W	504,512.26	726,504.30	2.78	-0.41	-7.35	
5,368.00	3.54	242.84	5,367.15	2.20 S	17.11 W	504,512.20	726,504.19	2.78	-0.46	-7.23	
5,370.00	3.59	242.73	5,369.15	2.26 S	17.22 W	504,512.14	726,504.08	2.78	-0.50	-7.12	
5,372.00	3.65	242.62	5,371.15	2.32 S	17.34 W	504,512.08	726,503.96	2.78	-0.55	-7.01	
5,374.00	3.70	242.52	5,373.14	2.37 S	17.45 W	504,512.03	726,503.85	2.78	-0.59	-6.90	
5,376.00	3.76	242.42	5,375.14	2.43 S	17.56 W	504,511.97	726,503.74	2.78	-0.64	-6.80	
5,378.00	3.81	242.32	5,377.13	2.50 S	17.68 W	504,511.90	726,503.62	2.78	-0.69	-6.70	
5,380.00	3.87	242.22	5,379.13	2.56 S	17.80 W	504,511.84	726,503.50	2.78	-0.74	-6.60	
5,382.00	3.92	242.13	5,381.13	2.62 S	17.92 W	504,511.78	726,503.38	2.78	-0.79	-6.51	
5,384.00	3.98	242.04	5,383.12	2.69 S	18.04 W	504,511.71	726,503.26	2.78	-0.84	-6.42	
5,386.00	4.03	241.95	5,385.12	2.75 S	18.16 W	504,511.65	726,503.14	2.78	-0.90	-6.33	
5,388.00	4.09	241.87	5,387.11	2.82 S	18.29 W	504,511.58	726,503.01	2.78	-0.95	-6.24	
5,390.00	4.14	241.79	5,389.11	2.89 S	18.42 W	504,511.51	726,502.88	2.78	-1.01	-6.15	
5,392.00	4.20	241.71	5,391.10	2.95 S	18.54 W	504,511.45	726,502.76	2.78	-1.06	-6.07	
5,394.00	4.25	241.63	5,393.09	3.02 S	18.67 W	504,511.38	726,502.63	2.78	-1.12	-5.99	
5,396.00	4.31	241.55	5,395.09	3.10 S	18.81 W	504,511.30	726,502.49	2.78	-1.18	-5.91	
5,398.00	4.37	241.48	5,397.08	3.17 S	18.94 W	504,511.23	726,502.36	2.78	-1.23	-5.84	
5,400.00	4.42	241.41	5,399.08	3.24 S	19.07 W	504,511.16	726,502.23	2.78	-1.29	-5.76	
5,402.00	4.48	241.33	5,401.07	3.32 S	19.21 W	504,511.08	726,502.09	2.78	-1.35	-5.69	
5,404.00	4.53	241.27	5,403.07	3.39 S	19.35 W	504,511.01	726,501.95	2.78	-1.41	-5.62	
5,406.00	4.59	241.20	5,405.06	3.47 S	19.49 W	504,510.93	726,501.81	2.78	-1.48	-5.55	
5,408.00	4.64	241.13	5,407.05	3.54 S	19.63 W	504,510.86	726,501.67	2.78	-1.54	-5.48	
5,410.00	4.70	241.10	5,409.05	3.62 S	19.77 W	504,510.78	726,501.53	2.83	-1.60	-2.85	
5,412.00	4.76	241.09	5,411.04	3.70 S	19.91 W	504,510.70	726,501.39	2.87	-1.67	-0.32	
5,414.00	4.81	241.09	5,413.03	3.78 S	20.06 W	504,510.62	726,501.24	2.87	-1.73	-0.32	
5,416.00	4.87	241.09	5,415.02	3.87 S	20.21 W	504,510.53	726,501.09	2.87	-1.80	-0.31	
5,418.00	4.93	241.08	5,417.02	3.95 S	20.36 W	504,510.45	726,500.94	2.87	-1.87	-0.31	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
5,420.00	4.99	241.08	5,419.01	4.03 S	20.51 W	504,510.37	726,500.79	2.87	-1.93	-0.31	
5,422.00	5.04	241.08	5,421.00	4.12 S	20.66 W	504,510.28	726,500.64	2.87	-2.00	-0.30	
5,424.00	5.10	241.07	5,422.99	4.20 S	20.82 W	504,510.20	726,500.48	2.87	-2.07	-0.30	
5,426.00	5.16	241.07	5,424.99	4.29 S	20.97 W	504,510.11	726,500.33	2.87	-2.14	-0.30	
5,428.00	5.22	241.07	5,426.98	4.38 S	21.13 W	504,510.02	726,500.17	2.87	-2.21	-0.29	
5,430.00	5.27	241.06	5,428.97	4.46 S	21.29 W	504,509.94	726,500.01	2.87	-2.29	-0.29	
5,432.00	5.33	241.06	5,430.96	4.55 S	21.45 W	504,509.85	726,499.85	2.87	-2.36	-0.29	
5,434.00	5.39	241.06	5,432.95	4.64 S	21.62 W	504,509.76	726,499.68	2.87	-2.43	-0.28	
5,436.00	5.45	241.05	5,434.94	4.74 S	21.78 W	504,509.66	726,499.52	2.87	-2.51	-0.28	
5,438.00	5.50	241.05	5,436.93	4.83 S	21.95 W	504,509.57	726,499.35	2.87	-2.58	-0.28	
5,440.00	5.56	241.05	5,438.93	4.92 S	22.12 W	504,509.48	726,499.18	2.87	-2.66	-0.28	
5,442.00	5.62	241.05	5,440.92	5.02 S	22.29 W	504,509.38	726,499.01	2.87	-2.73	-0.27	
5,444.00	5.68	241.04	5,442.91	5.11 S	22.46 W	504,509.29	726,498.84	2.87	-2.81	-0.27	
5,446.00	5.73	241.04	5,444.90	5.21 S	22.63 W	504,509.19	726,498.67	2.87	-2.89	-0.27	
5,448.00	5.79	241.04	5,446.89	5.30 S	22.81 W	504,509.10	726,498.49	2.87	-2.97	-0.26	
5,450.00	5.85	241.03	5,448.88	5.40 S	22.99 W	504,509.00	726,498.31	2.87	-3.05	-0.26	
5,452.00	5.91	241.03	5,450.87	5.50 S	23.17 W	504,508.90	726,498.13	2.87	-3.13	-0.26	
5,454.00	5.96	241.03	5,452.85	5.60 S	23.35 W	504,508.80	726,497.95	2.87	-3.21	-0.26	
5,456.00	6.02	241.03	5,454.84	5.70 S	23.53 W	504,508.70	726,497.77	2.87	-3.29	-0.25	
5,458.00	6.08	241.02	5,456.83	5.80 S	23.71 W	504,508.60	726,497.59	2.87	-3.37	-0.25	
5,460.00	6.14	241.02	5,458.82	5.91 S	23.90 W	504,508.49	726,497.40	2.87	-3.46	-0.25	
5,462.00	6.19	241.02	5,460.81	6.01 S	24.09 W	504,508.39	726,497.21	2.87	-3.54	-0.25	
5,464.00	6.25	241.02	5,462.80	6.12 S	24.28 W	504,508.28	726,497.02	2.87	-3.63	-0.24	
5,466.00	6.31	241.02	5,464.79	6.22 S	24.47 W	504,508.18	726,496.83	2.87	-3.71	-0.24	
5,468.00	6.37	241.01	5,466.77	6.33 S	24.66 W	504,508.07	726,496.64	2.87	-3.80	-0.24	
5,470.00	6.42	241.01	5,468.76	6.44 S	24.86 W	504,507.96	726,496.44	2.87	-3.89	-0.24	
5,472.00	6.48	241.01	5,470.75	6.55 S	25.05 W	504,507.85	726,496.25	2.87	-3.98	-0.24	
5,474.00	6.54	241.01	5,472.74	6.66 S	25.25 W	504,507.74	726,496.05	2.87	-4.07	-0.23	
5,476.00	6.60	241.01	5,474.72	6.77 S	25.45 W	504,507.63	726,495.85	2.87	-4.16	-0.23	
5,478.00	6.65	241.00	5,476.71	6.88 S	25.65 W	504,507.52	726,495.65	2.87	-4.25	-0.23	
5,480.00	6.71	241.00	5,478.70	6.99 S	25.86 W	504,507.41	726,495.44	2.87	-4.34	-0.23	
5,482.00	6.77	241.00	5,480.68	7.11 S	26.06 W	504,507.29	726,495.24	2.87	-4.43	-0.23	
5,484.00	6.83	241.00	5,482.67	7.22 S	26.27 W	504,507.18	726,495.03	2.87	-4.52	-0.22	
5,486.00	6.88	241.00	5,484.65	7.34 S	26.48 W	504,507.06	726,494.82	2.87	-4.62	-0.22	
5,488.00	6.94	240.99	5,486.64	7.45 S	26.69 W	504,506.95	726,494.61	2.87	-4.71	-0.22	
5,490.00	7.00	240.99	5,488.62	7.57 S	26.90 W	504,506.83	726,494.40	2.87	-4.81	-0.22	
5,492.00	7.06	240.99	5,490.61	7.69 S	27.12 W	504,506.71	726,494.18	2.87	-4.90	-0.22	



Eddy County, NM (NAD83)

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Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
5,494.00	7.11	240.99	5,492.59	7.81 S	27.33 W	504,506.59	726,493.97	2.87	-5.00	-0.22	
5,496.00	7.17	240.99	5,494.58	7.93 S	27.55 W	504,506.47	726,493.75	2.87	-5.10	-0.21	
5,498.00	7.23	240.98	5,496.56	8.05 S	27.77 W	504,506.35	726,493.53	2.87	-5.20	-0.21	
5,500.00	7.29	240.98	5,498.55	8.17 S	27.99 W	504,506.23	726,493.31	2.87	-5.30	-0.21	
5,502.00	7.34	240.98	5,500.53	8.30 S	28.21 W	504,506.10	726,493.09	2.87	-5.40	-0.21	
5,504.00	7.40	240.98	5,502.51	8.42 S	28.44 W	504,505.98	726,492.86	2.87	-5.50	-0.21	
5,506.00	7.43	240.96	5,504.50	8.55 S	28.66 W	504,505.85	726,492.64	1.28	-5.60	-6.33	
5,508.00	7.45	240.94	5,506.48	8.67 S	28.89 W	504,505.73	726,492.41	1.28	-5.70	-6.31	
5,510.00	7.48	240.91	5,508.46	8.80 S	29.11 W	504,505.60	726,492.19	1.28	-5.81	-6.29	
5,512.00	7.50	240.89	5,510.45	8.93 S	29.34 W	504,505.47	726,491.96	1.28	-5.91	-6.27	
5,514.00	7.53	240.87	5,512.43	9.05 S	29.57 W	504,505.35	726,491.73	1.28	-6.01	-6.25	
5,516.00	7.55	240.85	5,514.41	9.18 S	29.80 W	504,505.22	726,491.50	1.28	-6.12	-6.23	
5,518.00	7.58	240.83	5,516.39	9.31 S	30.03 W	504,505.09	726,491.27	1.28	-6.22	-6.21	
5,520.00	7.60	240.81	5,518.38	9.44 S	30.26 W	504,504.96	726,491.04	1.28	-6.33	-6.19	
5,522.00	7.63	240.79	5,520.36	9.57 S	30.49 W	504,504.83	726,490.81	1.28	-6.43	-6.16	
5,524.00	7.66	240.77	5,522.34	9.70 S	30.72 W	504,504.70	726,490.58	1.28	-6.54	-6.14	
5,526.00	7.68	240.75	5,524.32	9.83 S	30.96 W	504,504.57	726,490.34	1.28	-6.64	-6.12	
5,528.00	7.71	240.73	5,526.31	9.96 S	31.19 W	504,504.44	726,490.11	1.28	-6.75	-6.10	
5,530.00	7.73	240.71	5,528.29	10.09 S	31.42 W	504,504.31	726,489.88	1.28	-6.86	-6.08	
5,532.00	7.76	240.69	5,530.27	10.22 S	31.66 W	504,504.18	726,489.64	1.28	-6.96	-6.06	
5,534.00	7.78	240.67	5,532.25	10.35 S	31.90 W	504,504.05	726,489.40	1.28	-7.07	-6.04	
5,536.00	7.81	240.65	5,534.23	10.49 S	32.13 W	504,503.91	726,489.17	1.28	-7.18	-6.02	
5,538.00	7.83	240.63	5,536.21	10.62 S	32.37 W	504,503.78	726,488.93	1.28	-7.29	-6.00	
5,540.00	7.86	240.61	5,538.19	10.75 S	32.61 W	504,503.65	726,488.69	1.28	-7.40	-5.98	
5,542.00	7.88	240.59	5,540.18	10.89 S	32.85 W	504,503.51	726,488.45	1.28	-7.51	-5.96	
5,544.00	7.91	240.57	5,542.16	11.02 S	33.09 W	504,503.38	726,488.21	1.28	-7.62	-5.95	
5,546.00	7.94	240.55	5,544.14	11.16 S	33.33 W	504,503.24	726,487.97	1.28	-7.73	-5.93	
5,548.00	7.96	240.53	5,546.12	11.30 S	33.57 W	504,503.10	726,487.73	1.28	-7.84	-5.91	
5,550.00	7.99	240.51	5,548.10	11.43 S	33.81 W	504,502.97	726,487.49	1.28	-7.95	-5.89	
5,552.00	8.01	240.49	5,550.08	11.57 S	34.05 W	504,502.83	726,487.25	1.28	-8.06	-5.87	
5,554.00	8.04	240.47	5,552.06	11.71 S	34.29 W	504,502.69	726,487.01	1.28	-8.17	-5.85	
5,556.00	8.06	240.46	5,554.04	11.84 S	34.54 W	504,502.56	726,486.76	1.28	-8.29	-5.83	
5,558.00	8.09	240.44	5,556.02	11.98 S	34.78 W	504,502.42	726,486.52	1.28	-8.40	-5.81	
5,560.00	8.11	240.42	5,558.00	12.12 S	35.03 W	504,502.28	726,486.27	1.28	-8.51	-5.80	
5,562.00	8.14	240.40	5,559.98	12.26 S	35.27 W	504,502.14	726,486.03	1.28	-8.63	-5.78	
5,564.00	8.17	240.38	5,561.96	12.40 S	35.52 W	504,502.00	726,485.78	1.28	-8.74	-5.76	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
5,566.00	8.19	240.36	5,563.94	12.54 S	35.77 W	504,501.86	726,485.53	1.28	-8.86	-5.74	
5,568.00	8.22	240.35	5,565.92	12.68 S	36.01 W	504,501.72	726,485.29	1.28	-8.97	-5.72	
5,570.00	8.24	240.33	5,567.90	12.83 S	36.26 W	504,501.57	726,485.04	1.28	-9.09	-5.71	
5,572.00	8.27	240.31	5,569.88	12.97 S	36.51 W	504,501.43	726,484.79	1.28	-9.20	-5.69	
5,574.00	8.29	240.29	5,571.86	13.11 S	36.76 W	504,501.29	726,484.54	1.28	-9.32	-5.67	
5,576.00	8.32	240.28	5,573.84	13.25 S	37.01 W	504,501.15	726,484.29	1.28	-9.44	-5.65	
5,578.00	8.34	240.26	5,575.82	13.40 S	37.27 W	504,501.00	726,484.03	1.28	-9.56	-5.64	
5,580.00	8.37	240.24	5,577.79	13.54 S	37.52 W	504,500.86	726,483.78	1.28	-9.67	-5.62	
5,582.00	8.40	240.22	5,579.77	13.69 S	37.77 W	504,500.71	726,483.53	1.28	-9.79	-5.60	
5,584.00	8.42	240.21	5,581.75	13.83 S	38.02 W	504,500.57	726,483.28	1.28	-9.91	-5.58	
5,586.00	8.45	240.19	5,583.73	13.98 S	38.28 W	504,500.42	726,483.02	1.28	-10.03	-5.57	
5,588.00	8.47	240.17	5,585.71	14.12 S	38.53 W	504,500.28	726,482.77	1.28	-10.15	-5.55	
5,590.00	8.50	240.16	5,587.69	14.27 S	38.79 W	504,500.13	726,482.51	1.28	-10.27	-5.53	
5,592.00	8.52	240.14	5,589.66	14.42 S	39.05 W	504,499.98	726,482.25	1.28	-10.39	-5.52	
5,594.00	8.55	240.12	5,591.64	14.57 S	39.30 W	504,499.83	726,482.00	1.28	-10.51	-5.50	
5,596.00	8.57	240.11	5,593.62	14.71 S	39.56 W	504,499.69	726,481.74	1.28	-10.63	-5.49	
5,598.00	8.60	240.09	5,595.60	14.86 S	39.82 W	504,499.54	726,481.48	1.28	-10.75	-5.47	
5,600.00	8.61	239.99	5,597.57	15.01 S	40.08 W	504,499.39	726,481.22	0.93	-10.88	-55.37	
5,602.00	8.62	239.89	5,599.55	15.16 S	40.34 W	504,499.24	726,480.96	0.93	-11.00	-55.27	
5,604.00	8.63	239.78	5,601.53	15.31 S	40.60 W	504,499.09	726,480.70	0.93	-11.12	-55.17	
5,606.00	8.64	239.68	5,603.51	15.46 S	40.86 W	504,498.94	726,480.44	0.93	-11.25	-55.07	
5,608.00	8.65	239.58	5,605.48	15.62 S	41.12 W	504,498.78	726,480.18	0.93	-11.37	-54.97	
5,610.00	8.66	239.48	5,607.46	15.77 S	41.38 W	504,498.63	726,479.92	0.93	-11.50	-54.87	
5,612.00	8.67	239.38	5,609.44	15.92 S	41.64 W	504,498.48	726,479.66	0.93	-11.62	-54.77	
5,614.00	8.69	239.28	5,611.42	16.08 S	41.90 W	504,498.32	726,479.40	0.93	-11.75	-54.67	
5,616.00	8.70	239.18	5,613.39	16.23 S	42.16 W	504,498.17	726,479.14	0.93	-11.88	-54.57	
5,618.00	8.71	239.08	5,615.37	16.39 S	42.42 W	504,498.01	726,478.88	0.93	-12.01	-54.47	
5,620.00	8.72	238.98	5,617.35	16.54 S	42.68 W	504,497.86	726,478.62	0.93	-12.14	-54.38	
5,622.00	8.73	238.88	5,619.32	16.70 S	42.94 W	504,497.70	726,478.36	0.93	-12.27	-54.28	
5,624.00	8.74	238.78	5,621.30	16.86 S	43.20 W	504,497.54	726,478.10	0.93	-12.40	-54.18	
5,626.00	8.75	238.68	5,623.28	17.01 S	43.46 W	504,497.39	726,477.84	0.93	-12.53	-54.08	
5,628.00	8.76	238.58	5,625.25	17.17 S	43.72 W	504,497.23	726,477.58	0.93	-12.66	-53.98	
5,630.00	8.77	238.49	5,627.23	17.33 S	43.98 W	504,497.07	726,477.32	0.93	-12.79	-53.89	
5,632.00	8.78	238.39	5,629.21	17.49 S	44.24 W	504,496.91	726,477.06	0.93	-12.92	-53.79	
5,634.00	8.79	238.29	5,631.18	17.65 S	44.50 W	504,496.75	726,476.80	0.93	-13.06	-53.69	
5,636.00	8.81	238.19	5,633.16	17.81 S	44.76 W	504,496.59	726,476.54	0.93	-13.19	-53.60	
5,638.00	8.82	238.10	5,635.14	17.97 S	45.02 W	504,496.43	726,476.28	0.93	-13.32	-53.50	



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Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
5,640.00	8.83	238.00	5,637.11	18.14 S	45.28 W	504,496.26	726,476.02	0.93	-13.46	-53.40	
5,642.00	8.84	237.90	5,639.09	18.30 S	45.54 W	504,496.10	726,475.76	0.93	-13.59	-53.31	
5,644.00	8.85	237.80	5,641.06	18.46 S	45.80 W	504,495.94	726,475.50	0.93	-13.73	-53.21	
5,646.00	8.86	237.71	5,643.04	18.63 S	46.06 W	504,495.77	726,475.24	0.93	-13.87	-53.12	
5,648.00	8.87	237.61	5,645.02	18.79 S	46.32 W	504,495.61	726,474.98	0.93	-14.01	-53.02	
5,650.00	8.88	237.52	5,646.99	18.96 S	46.58 W	504,495.44	726,474.72	0.93	-14.14	-52.92	
5,652.00	8.89	237.42	5,648.97	19.12 S	46.84 W	504,495.28	726,474.46	0.93	-14.28	-52.83	
5,654.00	8.91	237.32	5,650.95	19.29 S	47.10 W	504,495.11	726,474.20	0.93	-14.42	-52.74	
5,656.00	8.92	237.23	5,652.92	19.46 S	47.36 W	504,494.94	726,473.94	0.93	-14.56	-52.64	
5,658.00	8.93	237.13	5,654.90	19.63 S	47.62 W	504,494.77	726,473.68	0.93	-14.70	-52.55	
5,660.00	8.94	237.04	5,656.87	19.80 S	47.88 W	504,494.60	726,473.42	0.93	-14.85	-52.45	
5,662.00	8.95	236.95	5,658.85	19.96 S	48.14 W	504,494.44	726,473.16	0.93	-14.99	-52.36	
5,664.00	8.96	236.85	5,660.82	20.14 S	48.40 W	504,494.26	726,472.90	0.93	-15.13	-52.27	
5,666.00	8.97	236.76	5,662.80	20.31 S	48.66 W	504,494.09	726,472.64	0.93	-15.27	-52.17	
5,668.00	8.99	236.66	5,664.77	20.48 S	48.92 W	504,493.92	726,472.38	0.93	-15.42	-52.08	
5,670.00	9.00	236.57	5,666.75	20.65 S	49.19 W	504,493.75	726,472.11	0.93	-15.56	-51.99	
5,672.00	9.01	236.48	5,668.73	20.82 S	49.45 W	504,493.58	726,471.85	0.93	-15.71	-51.89	
5,674.00	9.02	236.38	5,670.70	20.99 S	49.71 W	504,493.41	726,471.59	0.93	-15.85	-51.80	
5,676.00	9.03	236.29	5,672.68	21.17 S	49.97 W	504,493.23	726,471.33	0.93	-16.00	-51.71	
5,678.00	9.04	236.20	5,674.65	21.34 S	50.23 W	504,493.06	726,471.07	0.93	-16.15	-51.62	
5,680.00	9.05	236.10	5,676.63	21.52 S	50.49 W	504,492.88	726,470.81	0.93	-16.29	-51.53	
5,682.00	9.07	236.01	5,678.60	21.69 S	50.75 W	504,492.71	726,470.55	0.93	-16.44	-51.44	
5,684.00	9.08	235.92	5,680.58	21.87 S	51.01 W	504,492.53	726,470.29	0.93	-16.59	-51.35	
5,686.00	9.09	235.83	5,682.55	22.05 S	51.28 W	504,492.35	726,470.02	0.93	-16.74	-51.25	
5,688.00	9.10	235.74	5,684.53	22.23 S	51.54 W	504,492.17	726,469.76	0.93	-16.89	-51.16	
5,690.00	9.11	235.65	5,686.50	22.40 S	51.80 W	504,492.00	726,469.50	0.93	-17.04	-51.07	
5,692.00	9.12	235.56	5,688.48	22.58 S	52.06 W	504,491.82	726,469.24	0.93	-17.20	-50.98	
5,694.00	9.15	235.50	5,690.45	22.76 S	52.32 W	504,491.64	726,468.98	1.26	-17.35	-19.12	
5,696.00	9.18	235.49	5,692.42	22.94 S	52.58 W	504,491.46	726,468.72	1.80	-17.50	-3.33	
5,698.00	9.22	235.48	5,694.40	23.12 S	52.85 W	504,491.28	726,468.45	1.80	-17.65	-3.32	
5,700.00	9.26	235.46	5,696.37	23.31 S	53.11 W	504,491.09	726,468.19	1.80	-17.81	-3.30	
5,702.00	9.29	235.45	5,698.35	23.49 S	53.38 W	504,490.91	726,467.92	1.80	-17.96	-3.29	
5,704.00	9.33	235.44	5,700.32	23.67 S	53.64 W	504,490.73	726,467.66	1.80	-18.12	-3.28	
5,706.00	9.36	235.43	5,702.29	23.86 S	53.91 W	504,490.54	726,467.39	1.80	-18.28	-3.27	
5,708.00	9.40	235.41	5,704.27	24.04 S	54.18 W	504,490.36	726,467.12	1.80	-18.43	-3.25	
5,710.00	9.44	235.40	5,706.24	24.23 S	54.45 W	504,490.17	726,466.85	1.80	-18.59	-3.24	
5,712.00	9.47	235.39	5,708.21	24.41 S	54.72 W	504,489.99	726,466.58	1.80	-18.75	-3.23	

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Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
5,714.00	9.51	235.38	5,710.19	24.60 S	54.99 W	504,489.80	726,466.31	1.80	-18.91	-3.22	
5,716.00	9.54	235.36	5,712.16	24.79 S	55.26 W	504,489.61	726,466.04	1.80	-19.07	-3.21	
5,718.00	9.58	235.35	5,714.13	24.98 S	55.54 W	504,489.42	726,465.76	1.80	-19.23	-3.19	
5,720.00	9.62	235.34	5,716.10	25.17 S	55.81 W	504,489.23	726,465.49	1.80	-19.39	-3.18	
5,722.00	9.65	235.33	5,718.07	25.36 S	56.09 W	504,489.04	726,465.21	1.80	-19.55	-3.17	
5,724.00	9.69	235.32	5,720.05	25.55 S	56.36 W	504,488.85	726,464.94	1.80	-19.71	-3.16	
5,726.00	9.72	235.30	5,722.02	25.74 S	56.64 W	504,488.66	726,464.66	1.80	-19.87	-3.15	
5,728.00	9.76	235.29	5,723.99	25.93 S	56.92 W	504,488.47	726,464.38	1.80	-20.04	-3.14	
5,730.00	9.80	235.28	5,725.96	26.13 S	57.20 W	504,488.27	726,464.10	1.80	-20.20	-3.12	
5,732.00	9.83	235.27	5,727.93	26.32 S	57.48 W	504,488.08	726,463.82	1.80	-20.37	-3.11	
5,734.00	9.87	235.26	5,729.90	26.52 S	57.76 W	504,487.88	726,463.54	1.80	-20.53	-3.10	
5,736.00	9.90	235.25	5,731.87	26.71 S	58.04 W	504,487.69	726,463.26	1.80	-20.70	-3.09	
5,738.00	9.94	235.24	5,733.84	26.91 S	58.32 W	504,487.49	726,462.98	1.80	-20.86	-3.08	
5,740.00	9.98	235.23	5,735.81	27.11 S	58.61 W	504,487.29	726,462.69	1.80	-21.03	-3.07	
5,742.00	10.01	235.21	5,737.78	27.30 S	58.89 W	504,487.10	726,462.41	1.80	-21.20	-3.06	
5,744.00	10.05	235.20	5,739.75	27.50 S	59.18 W	504,486.90	726,462.12	1.80	-21.37	-3.05	
5,746.00	10.08	235.19	5,741.72	27.70 S	59.47 W	504,486.70	726,461.83	1.80	-21.54	-3.03	
5,748.00	10.12	235.18	5,743.69	27.90 S	59.75 W	504,486.50	726,461.55	1.80	-21.71	-3.02	
5,750.00	10.16	235.17	5,745.66	28.10 S	60.04 W	504,486.30	726,461.26	1.80	-21.88	-3.01	
5,752.00	10.19	235.16	5,747.63	28.31 S	60.33 W	504,486.09	726,460.97	1.80	-22.05	-3.00	
5,754.00	10.23	235.15	5,749.59	28.51 S	60.62 W	504,485.89	726,460.68	1.80	-22.22	-2.99	
5,756.00	10.26	235.14	5,751.56	28.71 S	60.92 W	504,485.69	726,460.38	1.80	-22.40	-2.98	
5,758.00	10.30	235.13	5,753.53	28.92 S	61.21 W	504,485.48	726,460.09	1.80	-22.57	-2.97	
5,760.00	10.34	235.12	5,755.50	29.12 S	61.50 W	504,485.28	726,459.80	1.80	-22.74	-2.96	
5,762.00	10.37	235.11	5,757.46	29.33 S	61.80 W	504,485.07	726,459.50	1.80	-22.92	-2.95	
5,764.00	10.41	235.10	5,759.43	29.53 S	62.09 W	504,484.87	726,459.21	1.80	-23.09	-2.94	
5,766.00	10.44	235.09	5,761.40	29.74 S	62.39 W	504,484.66	726,458.91	1.80	-23.27	-2.93	
5,768.00	10.48	235.08	5,763.37	29.95 S	62.69 W	504,484.45	726,458.61	1.80	-23.45	-2.92	
5,770.00	10.52	235.07	5,765.33	30.16 S	62.99 W	504,484.24	726,458.31	1.80	-23.62	-2.91	
5,772.00	10.55	235.06	5,767.30	30.37 S	63.29 W	504,484.03	726,458.01	1.80	-23.80	-2.90	
5,774.00	10.59	235.05	5,769.26	30.58 S	63.59 W	504,483.82	726,457.71	1.80	-23.98	-2.89	
5,776.00	10.62	235.04	5,771.23	30.79 S	63.89 W	504,483.61	726,457.41	1.80	-24.16	-2.88	
5,778.00	10.66	235.03	5,773.20	31.00 S	64.19 W	504,483.40	726,457.11	1.80	-24.34	-2.87	
5,780.00	10.70	235.02	5,775.16	31.21 S	64.50 W	504,483.19	726,456.80	1.80	-24.52	-2.86	
5,782.00	10.73	235.01	5,777.13	31.42 S	64.80 W	504,482.98	726,456.50	1.80	-24.70	-2.85	
5,784.00	10.77	235.00	5,779.09	31.64 S	65.11 W	504,482.76	726,456.19	1.80	-24.88	-2.84	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
5,786.00	10.80	234.99	5,781.06	31.85 S	65.41 W	504,482.55	726,455.89	1.80	-25.07	-2.83	
5,788.00	10.84	234.98	5,783.02	32.07 S	65.72 W	504,482.33	726,455.58	1.80	-25.25	-2.82	
5,790.00	10.84	234.92	5,784.99	32.28 S	66.03 W	504,482.12	726,455.27	0.57	-25.43	-68.57	
5,792.00	10.85	234.87	5,786.95	32.50 S	66.34 W	504,481.90	726,454.96	0.57	-25.62	-68.51	
5,794.00	10.85	234.81	5,788.91	32.72 S	66.64 W	504,481.68	726,454.66	0.57	-25.80	-68.46	
5,796.00	10.86	234.75	5,790.88	32.93 S	66.95 W	504,481.47	726,454.35	0.57	-25.99	-68.40	
5,798.00	10.86	234.70	5,792.84	33.15 S	67.26 W	504,481.25	726,454.04	0.57	-26.17	-68.35	
5,800.00	10.87	234.64	5,794.81	33.37 S	67.57 W	504,481.03	726,453.73	0.57	-26.36	-68.29	
5,802.00	10.87	234.58	5,796.77	33.59 S	67.87 W	504,480.81	726,453.43	0.57	-26.54	-68.24	
5,804.00	10.87	234.53	5,798.73	33.81 S	68.18 W	504,480.59	726,453.12	0.57	-26.73	-68.18	
5,806.00	10.88	234.47	5,800.70	34.03 S	68.49 W	504,480.37	726,452.81	0.57	-26.92	-68.12	
5,808.00	10.88	234.42	5,802.66	34.25 S	68.80 W	504,480.15	726,452.50	0.57	-27.10	-68.07	
5,810.00	10.89	234.36	5,804.63	34.47 S	69.10 W	504,479.93	726,452.20	0.57	-27.29	-68.01	
5,812.00	10.89	234.30	5,806.59	34.69 S	69.41 W	504,479.71	726,451.89	0.57	-27.48	-67.96	
5,814.00	10.90	234.25	5,808.55	34.91 S	69.72 W	504,479.49	726,451.58	0.57	-27.67	-67.90	
5,816.00	10.90	234.19	5,810.52	35.13 S	70.02 W	504,479.27	726,451.28	0.57	-27.86	-67.85	
5,818.00	10.90	234.14	5,812.48	35.35 S	70.33 W	504,479.05	726,450.97	0.57	-28.05	-67.79	
5,820.00	10.91	234.08	5,814.45	35.57 S	70.64 W	504,478.83	726,450.66	0.57	-28.24	-67.74	
5,822.00	10.91	234.02	5,816.41	35.79 S	70.94 W	504,478.61	726,450.36	0.57	-28.43	-67.68	
5,824.00	10.92	233.97	5,818.37	36.02 S	71.25 W	504,478.38	726,450.05	0.57	-28.62	-67.63	
5,826.00	10.92	233.91	5,820.34	36.24 S	71.56 W	504,478.16	726,449.74	0.57	-28.81	-67.57	
5,828.00	10.93	233.86	5,822.30	36.46 S	71.86 W	504,477.94	726,449.44	0.57	-29.00	-67.52	
5,830.00	10.93	233.80	5,824.27	36.69 S	72.17 W	504,477.71	726,449.13	0.57	-29.19	-67.46	
5,832.00	10.93	233.74	5,826.23	36.91 S	72.47 W	504,477.49	726,448.83	0.57	-29.38	-67.41	
5,834.00	10.94	233.69	5,828.19	37.13 S	72.78 W	504,477.27	726,448.52	0.57	-29.57	-67.36	
5,836.00	10.94	233.63	5,830.16	37.36 S	73.08 W	504,477.04	726,448.22	0.57	-29.77	-67.30	
5,838.00	10.95	233.58	5,832.12	37.59 S	73.39 W	504,476.81	726,447.91	0.57	-29.96	-67.25	
5,840.00	10.95	233.52	5,834.08	37.81 S	73.70 W	504,476.59	726,447.60	0.57	-30.15	-67.19	
5,842.00	10.96	233.47	5,836.05	38.04 S	74.00 W	504,476.36	726,447.30	0.57	-30.35	-67.14	
5,844.00	10.96	233.41	5,838.01	38.26 S	74.31 W	504,476.14	726,446.99	0.57	-30.54	-67.08	
5,846.00	10.97	233.36	5,839.97	38.49 S	74.61 W	504,475.91	726,446.69	0.57	-30.74	-67.03	
5,848.00	10.97	233.30	5,841.94	38.72 S	74.92 W	504,475.68	726,446.38	0.57	-30.93	-66.97	
5,850.00	10.97	233.25	5,843.90	38.95 S	75.22 W	504,475.45	726,446.08	0.57	-31.13	-66.92	
5,852.00	10.98	233.19	5,845.86	39.17 S	75.53 W	504,475.23	726,445.77	0.57	-31.32	-66.87	
5,854.00	10.98	233.14	5,847.83	39.40 S	75.83 W	504,475.00	726,445.47	0.57	-31.52	-66.81	
5,856.00	10.99	233.08	5,849.79	39.63 S	76.14 W	504,474.77	726,445.16	0.57	-31.72	-66.76	
5,858.00	10.99	233.02	5,851.75	39.86 S	76.44 W	504,474.54	726,444.86	0.57	-31.91	-66.70	

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				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
5,860.00	11.00	232.97	5,853.72	40.09 S	76.75 W	504,474.31	726,444.55	0.57	-32.11	-66.65	
5,862.00	11.00	232.91	5,855.68	40.32 S	77.05 W	504,474.08	726,444.25	0.57	-32.31	-66.59	
5,864.00	11.01	232.86	5,857.64	40.55 S	77.36 W	504,473.85	726,443.94	0.57	-32.51	-66.54	
5,866.00	11.01	232.81	5,859.61	40.78 S	77.66 W	504,473.62	726,443.64	0.57	-32.71	-66.49	
5,868.00	11.02	232.75	5,861.57	41.01 S	77.96 W	504,473.39	726,443.34	0.57	-32.91	-66.43	
5,870.00	11.02	232.70	5,863.53	41.24 S	78.27 W	504,473.16	726,443.03	0.57	-33.11	-66.38	
5,872.00	11.02	232.64	5,865.50	41.47 S	78.57 W	504,472.93	726,442.73	0.57	-33.30	-66.32	
5,874.00	11.03	232.59	5,867.46	41.71 S	78.88 W	504,472.69	726,442.42	0.57	-33.51	-66.27	
5,876.00	11.03	232.53	5,869.42	41.94 S	79.18 W	504,472.46	726,442.12	0.57	-33.71	-66.22	
5,878.00	11.04	232.48	5,871.39	42.17 S	79.48 W	504,472.23	726,441.82	0.57	-33.91	-66.16	
5,880.00	11.04	232.42	5,873.35	42.41 S	79.79 W	504,471.99	726,441.51	0.57	-34.11	-66.11	
5,882.00	11.05	232.37	5,875.31	42.64 S	80.09 W	504,471.76	726,441.21	0.57	-34.31	-66.06	
5,884.00	11.05	232.34	5,877.27	42.87 S	80.39 W	504,471.53	726,440.91	0.29	-34.51	-66.00	
5,886.00	11.05	232.34	5,879.24	43.11 S	80.70 W	504,471.29	726,440.60	0.00	-34.71	0.00	
5,888.00	11.05	232.34	5,881.20	43.34 S	81.00 W	504,471.06	726,440.30	0.00	-34.92	0.00	
5,890.00	11.05	232.34	5,883.16	43.58 S	81.31 W	504,470.82	726,439.99	0.00	-35.12	0.00	
5,892.00	11.05	232.34	5,885.13	43.81 S	81.61 W	504,470.59	726,439.69	0.00	-35.32	0.00	
5,894.00	11.05	232.33	5,887.09	44.05 S	81.91 W	504,470.35	726,439.39	0.26	-35.52	-25.69	
5,896.00	11.06	232.33	5,889.05	44.28 S	82.22 W	504,470.12	726,439.08	0.05	-35.73	-25.68	
5,898.00	11.06	232.32	5,891.01	44.51 S	82.52 W	504,469.89	726,438.78	0.05	-35.93	-25.68	
5,900.00	11.06	232.32	5,892.98	44.75 S	82.82 W	504,469.65	726,438.48	0.05	-36.13	-25.68	
5,902.00	11.06	232.32	5,894.94	44.98 S	83.13 W	504,469.42	726,438.17	0.05	-36.33	-25.67	
5,904.00	11.06	232.32	5,896.90	45.22 S	83.43 W	504,469.18	726,437.87	0.05	-36.54	-25.67	
5,906.00	11.06	232.32	5,898.87	45.45 S	83.73 W	504,468.95	726,437.57	0.05	-36.74	-25.67	
5,908.00	11.06	232.31	5,900.83	45.69 S	84.04 W	504,468.71	726,437.26	0.05	-36.94	-25.67	
5,910.00	11.06	232.31	5,902.79	45.92 S	84.34 W	504,468.48	726,436.96	0.05	-37.14	-25.66	
5,912.00	11.06	232.31	5,904.75	46.16 S	84.64 W	504,468.24	726,436.66	0.05	-37.35	-25.66	
5,914.00	11.06	232.31	5,906.72	46.39 S	84.95 W	504,468.01	726,436.35	0.05	-37.55	-25.66	
5,916.00	11.06	232.30	5,908.68	46.63 S	85.25 W	504,467.77	726,436.05	0.05	-37.75	-25.66	
5,918.00	11.06	232.30	5,910.64	46.86 S	85.56 W	504,467.54	726,435.74	0.05	-37.96	-25.66	
5,920.00	11.07	232.30	5,912.61	47.09 S	85.86 W	504,467.31	726,435.44	0.05	-38.16	-25.65	
5,922.00	11.07	232.30	5,914.57	47.33 S	86.16 W	504,467.07	726,435.14	0.05	-38.36	-25.65	
5,924.00	11.07	232.30	5,916.53	47.56 S	86.47 W	504,466.84	726,434.83	0.05	-38.56	-25.65	
5,926.00	11.07	232.29	5,918.49	47.80 S	86.77 W	504,466.60	726,434.53	0.05	-38.77	-25.65	
5,928.00	11.07	232.29	5,920.46	48.03 S	87.07 W	504,466.37	726,434.23	0.05	-38.97	-25.65	
5,930.00	11.07	232.29	5,922.42	48.27 S	87.38 W	504,466.13	726,433.92	0.05	-39.17	-25.64	
5,932.00	11.07	232.29	5,924.38	48.50 S	87.68 W	504,465.90	726,433.62	0.05	-39.38	-25.64	



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Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
5,934.00	11.07	232.29	5,926.35	48.74 S	87.99 W	504,465.66	726,433.31	0.05	-39.58	-25.64	
5,936.00	11.07	232.28	5,928.31	48.97 S	88.29 W	504,465.43	726,433.01	0.05	-39.78	-25.64	
5,938.00	11.07	232.28	5,930.27	49.21 S	88.59 W	504,465.19	726,432.71	0.05	-39.98	-25.64	
5,940.00	11.07	232.28	5,932.23	49.44 S	88.90 W	504,464.96	726,432.40	0.05	-40.19	-25.63	
5,942.00	11.08	232.28	5,934.20	49.68 S	89.20 W	504,464.72	726,432.10	0.05	-40.39	-25.63	
5,944.00	11.08	232.28	5,936.16	49.91 S	89.51 W	504,464.49	726,431.79	0.05	-40.59	-25.63	
5,946.00	11.08	232.27	5,938.12	50.15 S	89.81 W	504,464.25	726,431.49	0.05	-40.80	-25.63	
5,948.00	11.08	232.27	5,940.09	50.38 S	90.11 W	504,464.02	726,431.19	0.05	-41.00	-25.63	
5,950.00	11.08	232.27	5,942.05	50.62 S	90.42 W	504,463.78	726,430.88	0.05	-41.20	-25.62	
5,952.00	11.08	232.27	5,944.01	50.85 S	90.72 W	504,463.55	726,430.58	0.05	-41.41	-25.62	
5,954.00	11.08	232.26	5,945.97	51.09 S	91.03 W	504,463.31	726,430.27	0.05	-41.61	-25.62	
5,956.00	11.08	232.26	5,947.94	51.32 S	91.33 W	504,463.08	726,429.97	0.05	-41.81	-25.62	
5,958.00	11.08	232.26	5,949.90	51.56 S	91.63 W	504,462.84	726,429.67	0.05	-42.02	-25.61	
5,960.00	11.08	232.26	5,951.86	51.80 S	91.94 W	504,462.60	726,429.36	0.05	-42.22	-25.61	
5,962.00	11.08	232.26	5,953.82	52.03 S	92.24 W	504,462.37	726,429.06	0.05	-42.42	-25.61	
5,964.00	11.08	232.25	5,955.79	52.27 S	92.55 W	504,462.13	726,428.75	0.05	-42.63	-25.61	
5,966.00	11.09	232.25	5,957.75	52.50 S	92.85 W	504,461.90	726,428.45	0.05	-42.83	-25.61	
5,968.00	11.09	232.25	5,959.71	52.74 S	93.15 W	504,461.66	726,428.15	0.05	-43.03	-25.60	
5,970.00	11.09	232.25	5,961.67	52.97 S	93.46 W	504,461.43	726,427.84	0.05	-43.24	-25.60	
5,972.00	11.09	232.25	5,963.64	53.21 S	93.76 W	504,461.19	726,427.54	0.05	-43.44	-25.60	
5,974.00	11.09	232.24	5,965.60	53.44 S	94.07 W	504,460.96	726,427.23	0.05	-43.64	-25.60	
5,976.00	11.09	232.24	5,967.56	53.68 S	94.37 W	504,460.72	726,426.93	0.05	-43.85	-25.60	
5,978.00	11.09	232.18	5,969.53	53.91 S	94.67 W	504,460.49	726,426.63	0.56	-44.05	-94.21	
5,980.00	11.09	232.07	5,971.49	54.15 S	94.98 W	504,460.25	726,426.32	1.09	-44.25	-96.46	
5,982.00	11.08	231.96	5,973.45	54.39 S	95.28 W	504,460.01	726,426.02	1.09	-44.46	-96.35	
5,984.00	11.08	231.84	5,975.41	54.62 S	95.58 W	504,459.78	726,425.72	1.09	-44.66	-96.23	
5,986.00	11.08	231.73	5,977.38	54.86 S	95.88 W	504,459.54	726,425.42	1.09	-44.87	-96.12	
5,988.00	11.08	231.62	5,979.34	55.10 S	96.19 W	504,459.30	726,425.11	1.09	-45.08	-96.01	
5,990.00	11.07	231.50	5,981.30	55.34 S	96.49 W	504,459.06	726,424.81	1.09	-45.28	-95.90	
5,992.00	11.07	231.39	5,983.26	55.58 S	96.79 W	504,458.82	726,424.51	1.09	-45.49	-95.79	
5,994.00	11.07	231.28	5,985.23	55.82 S	97.09 W	504,458.58	726,424.21	1.09	-45.70	-95.68	
5,996.00	11.07	231.16	5,987.19	56.06 S	97.39 W	504,458.34	726,423.91	1.09	-45.91	-95.57	
5,998.00	11.07	231.05	5,989.15	56.30 S	97.69 W	504,458.10	726,423.61	1.09	-46.12	-95.46	
6,000.00	11.06	230.94	5,991.12	56.54 S	97.98 W	504,457.86	726,423.32	1.09	-46.33	-95.35	
6,002.00	11.06	230.82	5,993.08	56.78 S	98.28 W	504,457.62	726,423.02	1.09	-46.54	-95.23	
6,004.00	11.06	230.71	5,995.04	57.03 S	98.58 W	504,457.37	726,422.72	1.09	-46.75	-95.12	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
6,006.00	11.06	230.60	5,997.00	57.27 S	98.88 W	504,457.13	726,422.42	1.09	-46.96	-95.01	
6,008.00	11.06	230.48	5,998.97	57.51 S	99.17 W	504,456.89	726,422.13	1.09	-47.18	-94.90	
6,010.00	11.05	230.37	6,000.93	57.76 S	99.47 W	504,456.64	726,421.83	1.09	-47.39	-94.79	
6,012.00	11.05	230.26	6,002.89	58.00 S	99.76 W	504,456.40	726,421.54	1.09	-47.60	-94.68	
6,014.00	11.05	230.14	6,004.86	58.25 S	100.06 W	504,456.15	726,421.24	1.09	-47.82	-94.56	
6,016.00	11.05	230.03	6,006.82	58.49 S	100.35 W	504,455.91	726,420.95	1.09	-48.03	-94.45	
6,018.00	11.05	229.91	6,008.78	58.74 S	100.64 W	504,455.66	726,420.66	1.09	-48.25	-94.34	
6,020.00	11.05	229.80	6,010.74	58.99 S	100.94 W	504,455.41	726,420.36	1.09	-48.46	-94.23	
6,022.00	11.04	229.69	6,012.71	59.24 S	101.23 W	504,455.16	726,420.07	1.09	-48.68	-94.12	
6,024.00	11.04	229.57	6,014.67	59.48 S	101.52 W	504,454.92	726,419.78	1.09	-48.90	-94.01	
6,026.00	11.04	229.46	6,016.63	59.73 S	101.81 W	504,454.67	726,419.49	1.09	-49.12	-93.89	
6,028.00	11.04	229.34	6,018.60	59.98 S	102.10 W	504,454.42	726,419.20	1.09	-49.33	-93.78	
6,030.00	11.04	229.23	6,020.56	60.23 S	102.39 W	504,454.17	726,418.91	1.09	-49.55	-93.67	
6,032.00	11.04	229.12	6,022.52	60.48 S	102.68 W	504,453.92	726,418.62	1.09	-49.77	-93.56	
6,034.00	11.04	229.00	6,024.49	60.73 S	102.97 W	504,453.67	726,418.33	1.09	-49.99	-93.45	
6,036.00	11.04	228.89	6,026.45	60.98 S	103.26 W	504,453.42	726,418.04	1.09	-50.21	-93.33	
6,038.00	11.03	228.77	6,028.41	61.24 S	103.55 W	504,453.16	726,417.75	1.09	-50.44	-93.22	
6,040.00	11.03	228.66	6,030.37	61.49 S	103.84 W	504,452.91	726,417.46	1.09	-50.66	-93.11	
6,042.00	11.03	228.55	6,032.34	61.74 S	104.13 W	504,452.66	726,417.17	1.09	-50.88	-93.00	
6,044.00	11.03	228.43	6,034.30	62.00 S	104.41 W	504,452.40	726,416.89	1.09	-51.10	-92.89	
6,046.00	11.03	228.32	6,036.26	62.25 S	104.70 W	504,452.15	726,416.60	1.09	-51.33	-92.77	
6,048.00	11.03	228.20	6,038.23	62.50 S	104.98 W	504,451.90	726,416.32	1.09	-51.55	-92.66	
6,050.00	11.03	228.09	6,040.19	62.76 S	105.27 W	504,451.64	726,416.03	1.09	-51.78	-92.55	
6,052.00	11.03	227.97	6,042.15	63.02 S	105.55 W	504,451.38	726,415.75	1.09	-52.00	-92.44	
6,054.00	11.03	227.86	6,044.12	63.27 S	105.84 W	504,451.13	726,415.46	1.09	-52.23	-92.33	
6,056.00	11.03	227.75	6,046.08	63.53 S	106.12 W	504,450.87	726,415.18	1.09	-52.46	-92.21	
6,058.00	11.02	227.63	6,048.04	63.79 S	106.40 W	504,450.61	726,414.90	1.09	-52.68	-92.10	
6,060.00	11.02	227.52	6,050.01	64.04 S	106.68 W	504,450.36	726,414.62	1.09	-52.91	-91.99	
6,062.00	11.02	227.40	6,051.97	64.30 S	106.97 W	504,450.10	726,414.33	1.09	-53.14	-91.88	
6,064.00	11.02	227.29	6,053.93	64.56 S	107.25 W	504,449.84	726,414.05	1.09	-53.37	-91.76	
6,066.00	11.02	227.17	6,055.89	64.82 S	107.53 W	504,449.58	726,413.77	1.09	-53.60	-91.65	
6,068.00	11.02	227.06	6,057.86	65.08 S	107.81 W	504,449.32	726,413.49	1.09	-53.83	-91.54	
6,070.00	11.02	226.94	6,059.82	65.34 S	108.09 W	504,449.06	726,413.21	1.09	-54.06	-91.43	
6,072.00	11.02	226.83	6,061.78	65.60 S	108.37 W	504,448.80	726,412.93	1.09	-54.29	-91.31	
6,074.00	11.04	226.85	6,063.75	65.87 S	108.65 W	504,448.53	726,412.65	1.02	-54.53	12.10	
6,076.00	11.06	226.87	6,065.71	66.13 S	108.93 W	504,448.27	726,412.37	1.02	-54.76	12.08	
6,078.00	11.08	226.90	6,067.67	66.39 S	109.21 W	504,448.01	726,412.09	1.02	-54.99	12.05	



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				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
6,080.00	11.10	226.92	6,069.64	66.65 S	109.49 W	504,447.75	726,411.81	1.02	-55.22	12.03	
6,082.00	11.12	226.94	6,071.60	66.92 S	109.77 W	504,447.48	726,411.53	1.02	-55.46	12.01	
6,084.00	11.14	226.96	6,073.56	67.18 S	110.05 W	504,447.22	726,411.25	1.02	-55.69	11.99	
6,086.00	11.16	226.98	6,075.52	67.44 S	110.33 W	504,446.96	726,410.97	1.02	-55.92	11.97	
6,088.00	11.18	227.01	6,077.48	67.71 S	110.62 W	504,446.69	726,410.68	1.02	-56.16	11.95	
6,090.00	11.20	227.03	6,079.45	67.97 S	110.90 W	504,446.43	726,410.40	1.02	-56.39	11.92	
6,092.00	11.22	227.05	6,081.41	68.24 S	111.19 W	504,446.16	726,410.11	1.02	-56.63	11.90	
6,094.00	11.24	227.07	6,083.37	68.50 S	111.47 W	504,445.90	726,409.83	1.02	-56.86	11.88	
6,096.00	11.26	227.09	6,085.33	68.77 S	111.76 W	504,445.63	726,409.54	1.02	-57.10	11.86	
6,098.00	11.28	227.11	6,087.29	69.03 S	112.04 W	504,445.37	726,409.26	1.02	-57.33	11.84	
6,100.00	11.30	227.14	6,089.25	69.30 S	112.33 W	504,445.10	726,408.97	1.02	-57.57	11.82	
6,102.00	11.32	227.16	6,091.22	69.57 S	112.62 W	504,444.83	726,408.68	1.02	-57.81	11.80	
6,104.00	11.34	227.18	6,093.18	69.83 S	112.91 W	504,444.57	726,408.39	1.02	-58.04	11.78	
6,106.00	11.36	227.20	6,095.14	70.10 S	113.19 W	504,444.30	726,408.11	1.02	-58.28	11.76	
6,108.00	11.38	227.22	6,097.10	70.37 S	113.48 W	504,444.03	726,407.82	1.02	-58.52	11.74	
6,110.00	11.40	227.24	6,099.06	70.64 S	113.77 W	504,443.76	726,407.53	1.02	-58.75	11.71	
6,112.00	11.42	227.26	6,101.02	70.91 S	114.06 W	504,443.49	726,407.24	1.02	-58.99	11.69	
6,114.00	11.44	227.28	6,102.98	71.18 S	114.36 W	504,443.22	726,406.94	1.02	-59.23	11.67	
6,116.00	11.46	227.30	6,104.94	71.45 S	114.65 W	504,442.95	726,406.65	1.02	-59.47	11.65	
6,118.00	11.48	227.32	6,106.90	71.71 S	114.94 W	504,442.69	726,406.36	1.02	-59.71	11.63	
6,120.00	11.50	227.35	6,108.86	71.98 S	115.23 W	504,442.42	726,406.07	1.02	-59.95	11.61	
6,122.00	11.52	227.37	6,110.82	72.26 S	115.53 W	504,442.14	726,405.77	1.02	-60.19	11.59	
6,124.00	11.54	227.39	6,112.78	72.53 S	115.82 W	504,441.87	726,405.48	1.02	-60.42	11.57	
6,126.00	11.56	227.41	6,114.74	72.80 S	116.11 W	504,441.60	726,405.19	1.02	-60.66	11.55	
6,128.00	11.58	227.43	6,116.70	73.07 S	116.41 W	504,441.33	726,404.89	1.02	-60.90	11.53	
6,130.00	11.60	227.45	6,118.66	73.34 S	116.71 W	504,441.06	726,404.59	1.02	-61.14	11.51	
6,132.00	11.62	227.47	6,120.62	73.61 S	117.00 W	504,440.79	726,404.30	1.02	-61.39	11.49	
6,134.00	11.64	227.49	6,122.58	73.88 S	117.30 W	504,440.52	726,404.00	1.02	-61.63	11.47	
6,136.00	11.66	227.51	6,124.53	74.16 S	117.60 W	504,440.24	726,403.70	1.02	-61.87	11.45	
6,138.00	11.68	227.53	6,126.49	74.43 S	117.90 W	504,439.97	726,403.40	1.02	-62.11	11.43	
6,140.00	11.70	227.55	6,128.45	74.70 S	118.19 W	504,439.70	726,403.11	1.02	-62.35	11.41	
6,142.00	11.72	227.57	6,130.41	74.98 S	118.49 W	504,439.42	726,402.81	1.02	-62.59	11.39	
6,144.00	11.74	227.59	6,132.37	75.25 S	118.79 W	504,439.15	726,402.51	1.02	-62.84	11.37	
6,146.00	11.76	227.61	6,134.33	75.53 S	119.10 W	504,438.87	726,402.20	1.02	-63.08	11.36	
6,148.00	11.78	227.63	6,136.28	75.80 S	119.40 W	504,438.60	726,401.90	1.02	-63.32	11.34	
6,150.00	11.80	227.65	6,138.24	76.08 S	119.70 W	504,438.32	726,401.60	1.02	-63.57	11.32	
6,152.00	11.82	227.67	6,140.20	76.35 S	120.00 W	504,438.05	726,401.30	1.02	-63.81	11.30	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
6,154.00	11.84	227.69	6,142.16	76.63 S	120.30 W	504,437.77	726,401.00	1.02	-64.05	11.28	
6,156.00	11.86	227.70	6,144.11	76.91 S	120.61 W	504,437.49	726,400.69	1.02	-64.30	11.26	
6,158.00	11.88	227.72	6,146.07	77.18 S	120.91 W	504,437.22	726,400.39	1.02	-64.54	11.24	
6,160.00	11.90	227.74	6,148.03	77.46 S	121.22 W	504,436.94	726,400.08	1.02	-64.79	11.22	
6,162.00	11.92	227.76	6,149.99	77.74 S	121.52 W	504,436.66	726,399.78	1.02	-65.03	11.20	
6,164.00	11.94	227.78	6,151.94	78.02 S	121.83 W	504,436.38	726,399.47	1.02	-65.28	11.18	
6,166.00	11.96	227.80	6,153.90	78.29 S	122.14 W	504,436.11	726,399.16	1.02	-65.52	11.16	
6,168.00	11.97	227.81	6,155.86	78.57 S	122.44 W	504,435.83	726,398.86	0.51	-65.77	11.15	
6,170.00	11.97	227.77	6,157.81	78.85 S	122.75 W	504,435.55	726,398.55	0.42	-66.02	-73.11	
6,172.00	11.97	227.74	6,159.77	79.13 S	123.06 W	504,435.27	726,398.24	0.28	-66.26	-73.07	
6,174.00	11.98	227.72	6,161.73	79.41 S	123.36 W	504,434.99	726,397.94	0.28	-66.51	-73.04	
6,176.00	11.98	227.69	6,163.68	79.69 S	123.67 W	504,434.71	726,397.63	0.28	-66.75	-73.02	
6,178.00	11.98	227.67	6,165.64	79.97 S	123.98 W	504,434.43	726,397.32	0.28	-67.00	-72.99	
6,180.00	11.98	227.64	6,167.59	80.25 S	124.28 W	504,434.15	726,397.02	0.28	-67.25	-72.97	
6,182.00	11.98	227.61	6,169.55	80.53 S	124.59 W	504,433.87	726,396.71	0.28	-67.50	-72.94	
6,184.00	11.98	227.59	6,171.51	80.81 S	124.90 W	504,433.59	726,396.40	0.28	-67.74	-72.91	
6,186.00	11.99	227.56	6,173.46	81.09 S	125.20 W	504,433.31	726,396.10	0.28	-67.99	-72.89	
6,188.00	11.99	227.54	6,175.42	81.37 S	125.51 W	504,433.03	726,395.79	0.28	-68.24	-72.86	
6,190.00	11.99	227.51	6,177.38	81.65 S	125.82 W	504,432.75	726,395.48	0.28	-68.49	-72.84	
6,192.00	11.99	227.48	6,179.33	81.93 S	126.12 W	504,432.47	726,395.18	0.28	-68.74	-72.81	
6,194.00	11.99	227.46	6,181.29	82.21 S	126.43 W	504,432.19	726,394.87	0.28	-68.98	-72.79	
6,196.00	11.99	227.43	6,183.25	82.49 S	126.74 W	504,431.91	726,394.56	0.28	-69.23	-72.76	
6,198.00	12.00	227.41	6,185.20	82.77 S	127.04 W	504,431.63	726,394.26	0.28	-69.48	-72.74	
6,200.00	12.00	227.38	6,187.16	83.05 S	127.35 W	504,431.35	726,393.95	0.28	-69.73	-72.71	
6,202.00	12.00	227.35	6,189.11	83.33 S	127.65 W	504,431.07	726,393.65	0.28	-69.98	-72.69	
6,204.00	12.00	227.33	6,191.07	83.62 S	127.96 W	504,430.78	726,393.34	0.28	-70.23	-72.66	
6,206.00	12.00	227.30	6,193.03	83.90 S	128.27 W	504,430.50	726,393.03	0.28	-70.48	-72.63	
6,208.00	12.00	227.28	6,194.98	84.18 S	128.57 W	504,430.22	726,392.73	0.28	-70.73	-72.61	
6,210.00	12.01	227.25	6,196.94	84.46 S	128.88 W	504,429.94	726,392.42	0.28	-70.98	-72.58	
6,212.00	12.01	227.22	6,198.90	84.75 S	129.18 W	504,429.65	726,392.12	0.28	-71.23	-72.56	
6,214.00	12.01	227.20	6,200.85	85.03 S	129.49 W	504,429.37	726,391.81	0.28	-71.48	-72.53	
6,216.00	12.01	227.17	6,202.81	85.31 S	129.79 W	504,429.09	726,391.51	0.28	-71.73	-72.51	
6,218.00	12.01	227.15	6,204.76	85.59 S	130.10 W	504,428.81	726,391.20	0.28	-71.98	-72.48	
6,220.00	12.01	227.12	6,206.72	85.88 S	130.40 W	504,428.52	726,390.90	0.28	-72.23	-72.46	
6,222.00	12.02	227.09	6,208.68	86.16 S	130.71 W	504,428.24	726,390.59	0.28	-72.48	-72.43	
6,224.00	12.02	227.07	6,210.63	86.44 S	131.01 W	504,427.96	726,390.29	0.28	-72.73	-72.41	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
6,226.00	12.02	227.04	6,212.59	86.73 S	131.32 W	504,427.67	726,389.98	0.28	-72.98	-72.38	
6,228.00	12.02	227.02	6,214.55	87.01 S	131.62 W	504,427.39	726,389.68	0.28	-73.24	-72.36	
6,230.00	12.02	226.99	6,216.50	87.30 S	131.93 W	504,427.10	726,389.37	0.28	-73.49	-72.33	
6,232.00	12.02	226.96	6,218.46	87.58 S	132.23 W	504,426.82	726,389.07	0.28	-73.74	-72.30	
6,234.00	12.03	226.94	6,220.41	87.86 S	132.54 W	504,426.54	726,388.76	0.28	-73.99	-72.28	
6,236.00	12.03	226.91	6,222.37	88.15 S	132.84 W	504,426.25	726,388.46	0.28	-74.24	-72.25	
6,238.00	12.03	226.89	6,224.33	88.43 S	133.15 W	504,425.97	726,388.15	0.28	-74.50	-72.23	
6,240.00	12.03	226.86	6,226.28	88.72 S	133.45 W	504,425.68	726,387.85	0.28	-74.75	-72.20	
6,242.00	12.03	226.84	6,228.24	89.00 S	133.75 W	504,425.40	726,387.55	0.28	-75.00	-72.18	
6,244.00	12.04	226.81	6,230.19	89.29 S	134.06 W	504,425.11	726,387.24	0.28	-75.26	-72.15	
6,246.00	12.04	226.78	6,232.15	89.58 S	134.36 W	504,424.82	726,386.94	0.28	-75.51	-72.13	
6,248.00	12.04	226.76	6,234.11	89.86 S	134.67 W	504,424.54	726,386.63	0.28	-75.76	-72.10	
6,250.00	12.04	226.73	6,236.06	90.15 S	134.97 W	504,424.25	726,386.33	0.28	-76.02	-72.08	
6,252.00	12.04	226.71	6,238.02	90.43 S	135.27 W	504,423.97	726,386.03	0.28	-76.27	-72.05	
6,254.00	12.04	226.68	6,239.97	90.72 S	135.58 W	504,423.68	726,385.72	0.28	-76.52	-72.03	
6,256.00	12.05	226.65	6,241.93	91.01 S	135.88 W	504,423.39	726,385.42	0.28	-76.78	-72.00	
6,258.00	12.05	226.63	6,243.89	91.29 S	136.18 W	504,423.11	726,385.12	0.28	-77.03	-71.98	
6,260.00	12.05	226.60	6,245.84	91.58 S	136.49 W	504,422.82	726,384.81	0.28	-77.29	-71.95	
6,262.00	12.05	226.59	6,247.80	91.87 S	136.79 W	504,422.53	726,384.51	0.14	-77.54	-71.93	
6,264.00	12.04	226.55	6,249.75	92.15 S	137.09 W	504,422.25	726,384.21	0.55	-77.80	-127.79	
6,266.00	12.04	226.52	6,251.71	92.44 S	137.40 W	504,421.96	726,383.90	0.37	-78.05	-127.75	
6,268.00	12.03	226.49	6,253.67	92.73 S	137.70 W	504,421.67	726,383.60	0.37	-78.31	-127.72	
6,270.00	12.03	226.47	6,255.62	93.01 S	138.00 W	504,421.39	726,383.30	0.37	-78.56	-127.69	
6,272.00	12.03	226.44	6,257.58	93.30 S	138.30 W	504,421.10	726,383.00	0.37	-78.82	-127.66	
6,274.00	12.02	226.41	6,259.53	93.59 S	138.61 W	504,420.81	726,382.69	0.37	-79.07	-127.64	
6,276.00	12.02	226.38	6,261.49	93.88 S	138.91 W	504,420.52	726,382.39	0.37	-79.33	-127.61	
6,278.00	12.01	226.35	6,263.45	94.16 S	139.21 W	504,420.24	726,382.09	0.37	-79.58	-127.58	
6,280.00	12.01	226.33	6,265.40	94.45 S	139.51 W	504,419.95	726,381.79	0.37	-79.84	-127.56	
6,282.00	12.00	226.30	6,267.36	94.74 S	139.81 W	504,419.66	726,381.49	0.37	-80.09	-127.53	
6,284.00	12.00	226.27	6,269.32	95.02 S	140.11 W	504,419.38	726,381.19	0.37	-80.35	-127.50	
6,286.00	11.99	226.24	6,271.27	95.31 S	140.41 W	504,419.09	726,380.89	0.37	-80.60	-127.47	
6,288.00	11.99	226.21	6,273.23	95.60 S	140.71 W	504,418.80	726,380.59	0.37	-80.86	-127.45	
6,290.00	11.99	226.19	6,275.18	95.89 S	141.01 W	504,418.51	726,380.29	0.37	-81.11	-127.42	
6,292.00	11.98	226.16	6,277.14	96.17 S	141.31 W	504,418.23	726,379.99	0.37	-81.37	-127.39	
6,294.00	11.98	226.13	6,279.10	96.46 S	141.61 W	504,417.94	726,379.69	0.37	-81.63	-127.36	
6,296.00	11.97	226.10	6,281.05	96.75 S	141.91 W	504,417.65	726,379.39	0.37	-81.88	-127.34	
6,298.00	11.97	226.07	6,283.01	97.04 S	142.21 W	504,417.36	726,379.09	0.37	-82.14	-127.31	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
6,300.00	11.96	226.05	6,284.97	97.33 S	142.51 W	504,417.07	726,378.79	0.37	-82.39	-127.28	
6,302.00	11.96	226.02	6,286.92	97.61 S	142.80 W	504,416.79	726,378.50	0.37	-82.65	-127.25	
6,304.00	11.95	225.99	6,288.88	97.90 S	143.10 W	504,416.50	726,378.20	0.37	-82.91	-127.23	
6,306.00	11.95	225.96	6,290.84	98.19 S	143.40 W	504,416.21	726,377.90	0.37	-83.16	-127.20	
6,308.00	11.95	225.93	6,292.79	98.48 S	143.70 W	504,415.92	726,377.60	0.37	-83.42	-127.17	
6,310.00	11.94	225.90	6,294.75	98.76 S	144.00 W	504,415.64	726,377.30	0.37	-83.68	-127.14	
6,312.00	11.94	225.88	6,296.71	99.05 S	144.29 W	504,415.35	726,377.01	0.37	-83.93	-127.12	
6,314.00	11.93	225.85	6,298.66	99.34 S	144.59 W	504,415.06	726,376.71	0.37	-84.19	-127.09	
6,316.00	11.93	225.82	6,300.62	99.63 S	144.89 W	504,414.77	726,376.41	0.37	-84.44	-127.06	
6,318.00	11.92	225.79	6,302.58	99.92 S	145.18 W	504,414.48	726,376.12	0.37	-84.70	-127.03	
6,320.00	11.92	225.76	6,304.53	100.20 S	145.48 W	504,414.20	726,375.82	0.37	-84.96	-127.01	
6,322.00	11.91	225.73	6,306.49	100.49 S	145.77 W	504,413.91	726,375.53	0.37	-85.21	-126.98	
6,324.00	11.91	225.71	6,308.45	100.78 S	146.07 W	504,413.62	726,375.23	0.37	-85.47	-126.95	
6,326.00	11.91	225.68	6,310.40	101.07 S	146.36 W	504,413.33	726,374.94	0.37	-85.73	-126.92	
6,328.00	11.90	225.65	6,312.36	101.36 S	146.66 W	504,413.04	726,374.64	0.37	-85.99	-126.89	
6,330.00	11.90	225.62	6,314.32	101.65 S	146.95 W	504,412.75	726,374.35	0.37	-86.24	-126.87	
6,332.00	11.89	225.59	6,316.28	101.93 S	147.25 W	504,412.47	726,374.05	0.37	-86.50	-126.84	
6,334.00	11.89	225.56	6,318.23	102.22 S	147.54 W	504,412.18	726,373.76	0.37	-86.76	-126.81	
6,336.00	11.88	225.54	6,320.19	102.51 S	147.84 W	504,411.89	726,373.46	0.37	-87.01	-126.78	
6,338.00	11.88	225.51	6,322.15	102.80 S	148.13 W	504,411.60	726,373.17	0.37	-87.27	-126.76	
6,340.00	11.87	225.48	6,324.10	103.09 S	148.43 W	504,411.31	726,372.87	0.37	-87.53	-126.73	
6,342.00	11.87	225.45	6,326.06	103.38 S	148.72 W	504,411.02	726,372.58	0.37	-87.79	-126.70	
6,344.00	11.87	225.42	6,328.02	103.67 S	149.01 W	504,410.73	726,372.29	0.37	-88.04	-126.67	
6,346.00	11.86	225.39	6,329.98	103.95 S	149.30 W	504,410.45	726,372.00	0.37	-88.30	-126.64	
6,348.00	11.86	225.36	6,331.93	104.24 S	149.60 W	504,410.16	726,371.70	0.37	-88.56	-126.62	
6,350.00	11.85	225.34	6,333.89	104.53 S	149.89 W	504,409.87	726,371.41	0.37	-88.82	-126.59	
6,352.00	11.85	225.31	6,335.85	104.82 S	150.18 W	504,409.58	726,371.12	0.37	-89.07	-126.56	
6,354.00	11.84	225.28	6,337.81	105.11 S	150.47 W	504,409.29	726,370.83	0.37	-89.33	-126.53	
6,356.00	11.84	225.25	6,339.76	105.40 S	150.76 W	504,409.00	726,370.54	0.37	-89.59	-126.50	
6,358.00	11.84	225.28	6,341.72	105.69 S	151.06 W	504,408.71	726,370.24	0.31	-89.85	57.97	
6,360.00	11.85	225.30	6,343.68	105.98 S	151.35 W	504,408.42	726,369.95	0.31	-90.10	57.94	
6,362.00	11.85	225.33	6,345.64	106.26 S	151.64 W	504,408.14	726,369.66	0.31	-90.36	57.91	
6,364.00	11.85	225.35	6,347.59	106.55 S	151.93 W	504,407.85	726,369.37	0.31	-90.62	57.89	
6,366.00	11.86	225.38	6,349.55	106.84 S	152.22 W	504,407.56	726,369.08	0.31	-90.88	57.86	
6,368.00	11.86	225.40	6,351.51	107.13 S	152.52 W	504,407.27	726,368.78	0.31	-91.14	57.84	
6,370.00	11.86	225.43	6,353.46	107.42 S	152.81 W	504,406.98	726,368.49	0.31	-91.39	57.81	
6,372.00	11.87	225.46	6,355.42	107.71 S	153.10 W	504,406.69	726,368.20	0.31	-91.65	57.79	



Eddy County, NM (NAD83)

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Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
6,374.00	11.87	225.48	6,357.38	108.00 S	153.40 W	504,406.40	726,367.90	0.31	-91.91	57.76	
6,376.00	11.87	225.51	6,359.34	108.28 S	153.69 W	504,406.12	726,367.61	0.31	-92.16	57.74	
6,378.00	11.88	225.53	6,361.29	108.57 S	153.98 W	504,405.83	726,367.32	0.31	-92.42	57.71	
6,380.00	11.88	225.56	6,363.25	108.86 S	154.28 W	504,405.54	726,367.02	0.31	-92.68	57.69	
6,382.00	11.88	225.58	6,365.21	109.15 S	154.57 W	504,405.25	726,366.73	0.31	-92.94	57.66	
6,384.00	11.89	225.61	6,367.17	109.44 S	154.87 W	504,404.96	726,366.43	0.31	-93.19	57.64	
6,386.00	11.89	225.64	6,369.12	109.73 S	155.16 W	504,404.67	726,366.14	0.31	-93.45	57.61	
6,388.00	11.89	225.66	6,371.08	110.01 S	155.45 W	504,404.39	726,365.85	0.31	-93.71	57.59	
6,390.00	11.90	225.69	6,373.04	110.30 S	155.75 W	504,404.10	726,365.55	0.31	-93.96	57.56	
6,392.00	11.90	225.71	6,374.99	110.59 S	156.04 W	504,403.81	726,365.26	0.31	-94.22	57.54	
6,394.00	11.90	225.74	6,376.95	110.88 S	156.34 W	504,403.52	726,364.96	0.31	-94.48	57.51	
6,396.00	11.91	225.76	6,378.91	111.17 S	156.64 W	504,403.23	726,364.66	0.31	-94.73	57.49	
6,398.00	11.91	225.79	6,380.86	111.45 S	156.93 W	504,402.95	726,364.37	0.31	-94.99	57.46	
6,400.00	11.91	225.81	6,382.82	111.74 S	157.23 W	504,402.66	726,364.07	0.31	-95.25	57.44	
6,402.00	11.92	225.84	6,384.78	112.03 S	157.52 W	504,402.37	726,363.78	0.31	-95.50	57.41	
6,404.00	11.92	225.87	6,386.73	112.32 S	157.82 W	504,402.08	726,363.48	0.31	-95.76	57.39	
6,406.00	11.92	225.89	6,388.69	112.60 S	158.12 W	504,401.80	726,363.18	0.31	-96.01	57.36	
6,408.00	11.93	225.92	6,390.65	112.89 S	158.41 W	504,401.51	726,362.89	0.31	-96.27	57.34	
6,410.00	11.93	225.94	6,392.61	113.18 S	158.71 W	504,401.22	726,362.59	0.31	-96.53	57.31	
6,412.00	11.93	225.97	6,394.56	113.47 S	159.01 W	504,400.93	726,362.29	0.31	-96.78	57.29	
6,414.00	11.94	225.99	6,396.52	113.75 S	159.30 W	504,400.65	726,362.00	0.31	-97.04	57.26	
6,416.00	11.94	226.02	6,398.48	114.04 S	159.60 W	504,400.36	726,361.70	0.31	-97.29	57.24	
6,418.00	11.94	226.04	6,400.43	114.33 S	159.90 W	504,400.07	726,361.40	0.31	-97.55	57.21	
6,420.00	11.95	226.07	6,402.39	114.62 S	160.20 W	504,399.78	726,361.10	0.31	-97.80	57.19	
6,422.00	11.95	226.09	6,404.35	114.90 S	160.50 W	504,399.50	726,360.80	0.31	-98.06	57.16	
6,424.00	11.95	226.12	6,406.30	115.19 S	160.79 W	504,399.21	726,360.51	0.31	-98.32	57.14	
6,426.00	11.96	226.14	6,408.26	115.48 S	161.09 W	504,398.92	726,360.21	0.31	-98.57	57.11	
6,428.00	11.96	226.17	6,410.22	115.76 S	161.39 W	504,398.64	726,359.91	0.31	-98.83	57.09	
6,430.00	11.96	226.20	6,412.17	116.05 S	161.69 W	504,398.35	726,359.61	0.31	-99.08	57.07	
6,432.00	11.97	226.22	6,414.13	116.34 S	161.99 W	504,398.06	726,359.31	0.31	-99.34	57.04	
6,434.00	11.97	226.25	6,416.09	116.63 S	162.29 W	504,397.77	726,359.01	0.31	-99.59	57.02	
6,436.00	11.97	226.27	6,418.04	116.91 S	162.59 W	504,397.49	726,358.71	0.31	-99.85	56.99	
6,438.00	11.98	226.30	6,420.00	117.20 S	162.89 W	504,397.20	726,358.41	0.31	-100.10	56.97	
6,440.00	11.98	226.32	6,421.95	117.49 S	163.19 W	504,396.91	726,358.11	0.31	-100.36	56.94	
6,442.00	11.98	226.35	6,423.91	117.77 S	163.49 W	504,396.63	726,357.81	0.31	-100.61	56.92	
6,444.00	11.99	226.37	6,425.87	118.06 S	163.79 W	504,396.34	726,357.51	0.31	-100.87	56.89	

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Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
6,446.00	11.99	226.40	6,427.82	118.35 S	164.09 W	504,396.05	726,357.21	0.31	-101.12	56.87	
6,448.00	11.99	226.42	6,429.78	118.63 S	164.39 W	504,395.77	726,356.91	0.31	-101.38	56.84	
6,450.00	12.00	226.45	6,431.74	118.92 S	164.69 W	504,395.48	726,356.61	0.31	-101.63	56.82	
6,452.00	12.00	226.46	6,433.69	119.21 S	165.00 W	504,395.19	726,356.30	0.16	-101.88	56.79	
6,454.00	12.00	226.43	6,435.65	119.49 S	165.30 W	504,394.91	726,356.00	0.32	-102.14	-123.67	
6,456.00	11.99	226.42	6,437.61	119.78 S	165.60 W	504,394.62	726,355.70	0.21	-102.39	-123.64	
6,458.00	11.99	226.40	6,439.56	120.07 S	165.90 W	504,394.33	726,355.40	0.21	-102.65	-123.62	
6,460.00	11.99	226.38	6,441.52	120.35 S	166.20 W	504,394.05	726,355.10	0.21	-102.90	-123.61	
6,462.00	11.99	226.37	6,443.47	120.64 S	166.50 W	504,393.76	726,354.80	0.21	-103.16	-123.59	
6,464.00	11.98	226.35	6,445.43	120.93 S	166.80 W	504,393.47	726,354.50	0.21	-103.41	-123.57	
6,466.00	11.98	226.33	6,447.39	121.21 S	167.10 W	504,393.19	726,354.20	0.21	-103.67	-123.56	
6,468.00	11.98	226.31	6,449.34	121.50 S	167.40 W	504,392.90	726,353.90	0.21	-103.92	-123.54	
6,470.00	11.98	226.30	6,451.30	121.79 S	167.70 W	504,392.61	726,353.60	0.21	-104.18	-123.52	
6,472.00	11.98	226.28	6,453.26	122.07 S	168.00 W	504,392.33	726,353.30	0.21	-104.43	-123.51	
6,474.00	11.97	226.26	6,455.21	122.36 S	168.30 W	504,392.04	726,353.00	0.21	-104.69	-123.49	
6,476.00	11.97	226.25	6,457.17	122.65 S	168.60 W	504,391.75	726,352.70	0.21	-104.94	-123.47	
6,478.00	11.97	226.23	6,459.13	122.93 S	168.90 W	504,391.47	726,352.40	0.21	-105.20	-123.46	
6,480.00	11.97	226.21	6,461.08	123.22 S	169.20 W	504,391.18	726,352.10	0.21	-105.45	-123.44	
6,482.00	11.96	226.19	6,463.04	123.51 S	169.50 W	504,390.89	726,351.80	0.21	-105.71	-123.42	
6,484.00	11.96	226.18	6,465.00	123.79 S	169.80 W	504,390.61	726,351.50	0.21	-105.96	-123.41	
6,486.00	11.96	226.16	6,466.95	124.08 S	170.10 W	504,390.32	726,351.20	0.21	-106.22	-123.39	
6,488.00	11.96	226.14	6,468.91	124.37 S	170.40 W	504,390.03	726,350.90	0.21	-106.47	-123.37	
6,490.00	11.95	226.13	6,470.87	124.65 S	170.70 W	504,389.75	726,350.60	0.21	-106.73	-123.36	
6,492.00	11.95	226.11	6,472.82	124.94 S	170.99 W	504,389.46	726,350.31	0.21	-106.98	-123.34	
6,494.00	11.95	226.09	6,474.78	125.23 S	171.29 W	504,389.17	726,350.01	0.21	-107.24	-123.32	
6,496.00	11.95	226.07	6,476.74	125.52 S	171.59 W	504,388.88	726,349.71	0.21	-107.49	-123.31	
6,498.00	11.94	226.06	6,478.69	125.80 S	171.89 W	504,388.60	726,349.41	0.21	-107.75	-123.29	
6,500.00	11.94	226.04	6,480.65	126.09 S	172.19 W	504,388.31	726,349.11	0.21	-108.01	-123.27	
6,502.00	11.94	226.02	6,482.61	126.38 S	172.48 W	504,388.02	726,348.82	0.21	-108.26	-123.25	
6,504.00	11.94	226.01	6,484.56	126.67 S	172.78 W	504,387.73	726,348.52	0.21	-108.52	-123.24	
6,506.00	11.94	225.99	6,486.52	126.95 S	173.08 W	504,387.45	726,348.22	0.21	-108.77	-123.22	
6,508.00	11.93	225.97	6,488.48	127.24 S	173.38 W	504,387.16	726,347.92	0.21	-109.03	-123.20	
6,510.00	11.93	225.95	6,490.43	127.53 S	173.67 W	504,386.87	726,347.63	0.21	-109.28	-123.19	
6,512.00	11.93	225.94	6,492.39	127.81 S	173.97 W	504,386.59	726,347.33	0.21	-109.54	-123.17	
6,514.00	11.93	225.92	6,494.35	128.10 S	174.27 W	504,386.30	726,347.03	0.21	-109.80	-123.15	
6,516.00	11.92	225.90	6,496.30	128.39 S	174.57 W	504,386.01	726,346.73	0.21	-110.05	-123.14	
6,518.00	11.92	225.88	6,498.26	128.68 S	174.86 W	504,385.72	726,346.44	0.21	-110.31	-123.12	

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Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
6,520.00	11.92	225.87	6,500.22	128.97 S	175.16 W	504,385.43	726,346.14	0.21	-110.56	-123.10	
6,522.00	11.92	225.85	6,502.17	129.25 S	175.46 W	504,385.15	726,345.84	0.21	-110.82	-123.09	
6,524.00	11.91	225.83	6,504.13	129.54 S	175.75 W	504,384.86	726,345.55	0.21	-111.08	-123.07	
6,526.00	11.91	225.81	6,506.09	129.83 S	176.05 W	504,384.57	726,345.25	0.21	-111.33	-123.05	
6,528.00	11.91	225.80	6,508.04	130.12 S	176.34 W	504,384.28	726,344.96	0.21	-111.59	-123.04	
6,530.00	11.91	225.78	6,510.00	130.40 S	176.64 W	504,384.00	726,344.66	0.21	-111.85	-123.02	
6,532.00	11.91	225.76	6,511.96	130.69 S	176.93 W	504,383.71	726,344.37	0.21	-112.10	-123.00	
6,534.00	11.90	225.75	6,513.92	130.98 S	177.23 W	504,383.42	726,344.07	0.21	-112.36	-122.98	
6,536.00	11.90	225.73	6,515.87	131.27 S	177.53 W	504,383.13	726,343.77	0.21	-112.62	-122.97	
6,538.00	11.90	225.71	6,517.83	131.56 S	177.82 W	504,382.84	726,343.48	0.21	-112.87	-122.95	
6,540.00	11.90	225.69	6,519.79	131.84 S	178.12 W	504,382.56	726,343.18	0.21	-113.13	-122.93	
6,542.00	11.89	225.68	6,521.74	132.13 S	178.41 W	504,382.27	726,342.89	0.21	-113.39	-122.92	
6,544.00	11.89	225.66	6,523.70	132.42 S	178.71 W	504,381.98	726,342.59	0.21	-113.64	-122.90	
6,546.00	11.89	225.65	6,525.66	132.71 S	179.00 W	504,381.69	726,342.30	0.11	-113.90	-122.88	
6,548.00	11.89	225.65	6,527.61	133.00 S	179.30 W	504,381.40	726,342.00	0.00	-114.16	0.00	
6,550.00	11.88	225.68	6,529.57	133.28 S	179.59 W	504,381.12	726,341.71	0.40	-114.41	131.81	
6,552.00	11.88	225.69	6,531.53	133.57 S	179.88 W	504,380.83	726,341.42	0.16	-114.67	131.79	
6,554.00	11.88	225.70	6,533.49	133.86 S	180.18 W	504,380.54	726,341.12	0.16	-114.92	131.78	
6,556.00	11.88	225.71	6,535.44	134.15 S	180.47 W	504,380.25	726,340.83	0.16	-115.18	131.76	
6,558.00	11.88	225.72	6,537.40	134.43 S	180.77 W	504,379.97	726,340.53	0.16	-115.44	131.75	
6,560.00	11.87	225.74	6,539.36	134.72 S	181.06 W	504,379.68	726,340.24	0.16	-115.69	131.74	
6,562.00	11.87	225.75	6,541.32	135.01 S	181.36 W	504,379.39	726,339.94	0.16	-115.95	131.73	
6,564.00	11.87	225.76	6,543.27	135.29 S	181.65 W	504,379.11	726,339.65	0.16	-116.20	131.72	
6,566.00	11.87	225.77	6,545.23	135.58 S	181.95 W	504,378.82	726,339.35	0.16	-116.46	131.71	
6,568.00	11.87	225.78	6,547.19	135.87 S	182.24 W	504,378.53	726,339.06	0.16	-116.72	131.70	
6,570.00	11.86	225.79	6,549.14	136.16 S	182.54 W	504,378.24	726,338.76	0.16	-116.97	131.68	
6,572.00	11.86	225.81	6,551.10	136.44 S	182.83 W	504,377.96	726,338.47	0.16	-117.23	131.67	
6,574.00	11.86	225.82	6,553.06	136.73 S	183.13 W	504,377.67	726,338.17	0.16	-117.48	131.66	
6,576.00	11.86	225.83	6,555.02	137.01 S	183.42 W	504,377.39	726,337.88	0.16	-117.74	131.65	
6,578.00	11.86	225.84	6,556.97	137.30 S	183.72 W	504,377.10	726,337.58	0.16	-117.99	131.64	
6,580.00	11.85	225.85	6,558.93	137.59 S	184.01 W	504,376.81	726,337.29	0.16	-118.25	131.63	
6,582.00	11.85	225.86	6,560.89	137.87 S	184.31 W	504,376.53	726,336.99	0.16	-118.50	131.62	
6,584.00	11.85	225.87	6,562.85	138.16 S	184.60 W	504,376.24	726,336.70	0.16	-118.76	131.61	
6,586.00	11.85	225.89	6,564.80	138.45 S	184.89 W	504,375.95	726,336.41	0.16	-119.01	131.59	
6,588.00	11.84	225.90	6,566.76	138.73 S	185.19 W	504,375.67	726,336.11	0.16	-119.26	131.58	
6,590.00	11.84	225.91	6,568.72	139.02 S	185.48 W	504,375.38	726,335.82	0.16	-119.52	131.57	
6,592.00	11.84	225.92	6,570.68	139.30 S	185.78 W	504,375.10	726,335.52	0.16	-119.77	131.56	

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				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
6,594.00	11.84	225.93	6,572.63	139.59 S	186.07 W	504,374.81	726,335.23	0.16	-120.03	131.55	
6,596.00	11.84	225.94	6,574.59	139.87 S	186.37 W	504,374.53	726,334.93	0.16	-120.28	131.54	
6,598.00	11.83	225.96	6,576.55	140.16 S	186.66 W	504,374.24	726,334.64	0.16	-120.54	131.53	
6,600.00	11.83	225.97	6,578.51	140.44 S	186.96 W	504,373.96	726,334.34	0.16	-120.79	131.52	
6,602.00	11.83	225.98	6,580.46	140.73 S	187.25 W	504,373.67	726,334.05	0.16	-121.04	131.50	
6,604.00	11.83	225.99	6,582.42	141.01 S	187.55 W	504,373.39	726,333.75	0.16	-121.30	131.49	
6,606.00	11.83	226.00	6,584.38	141.30 S	187.84 W	504,373.10	726,333.46	0.16	-121.55	131.48	
6,608.00	11.82	226.01	6,586.34	141.58 S	188.14 W	504,372.82	726,333.16	0.16	-121.80	131.47	
6,610.00	11.82	226.03	6,588.29	141.87 S	188.43 W	504,372.53	726,332.87	0.16	-122.06	131.46	
6,612.00	11.82	226.04	6,590.25	142.15 S	188.73 W	504,372.25	726,332.57	0.16	-122.31	131.45	
6,614.00	11.82	226.05	6,592.21	142.44 S	189.02 W	504,371.96	726,332.28	0.16	-122.56	131.44	
6,616.00	11.82	226.06	6,594.17	142.72 S	189.32 W	504,371.68	726,331.98	0.16	-122.82	131.42	
6,618.00	11.81	226.07	6,596.12	143.00 S	189.61 W	504,371.40	726,331.69	0.16	-123.07	131.41	
6,620.00	11.81	226.08	6,598.08	143.29 S	189.91 W	504,371.11	726,331.39	0.16	-123.32	131.40	
6,622.00	11.81	226.10	6,600.04	143.57 S	190.20 W	504,370.83	726,331.10	0.16	-123.57	131.39	
6,624.00	11.81	226.11	6,602.00	143.86 S	190.50 W	504,370.54	726,330.80	0.16	-123.83	131.38	
6,626.00	11.80	226.12	6,603.95	144.14 S	190.79 W	504,370.26	726,330.51	0.16	-124.08	131.37	
6,628.00	11.80	226.13	6,605.91	144.42 S	191.09 W	504,369.98	726,330.21	0.16	-124.33	131.36	
6,630.00	11.80	226.14	6,607.87	144.71 S	191.38 W	504,369.69	726,329.92	0.16	-124.58	131.34	
6,632.00	11.80	226.15	6,609.83	144.99 S	191.68 W	504,369.41	726,329.62	0.16	-124.83	131.33	
6,634.00	11.80	226.16	6,611.78	145.27 S	191.97 W	504,369.13	726,329.33	0.16	-125.09	131.32	
6,636.00	11.79	226.18	6,613.74	145.56 S	192.27 W	504,368.84	726,329.03	0.16	-125.34	131.31	
6,638.00	11.79	226.19	6,615.70	145.84 S	192.56 W	504,368.56	726,328.74	0.16	-125.59	131.30	
6,640.00	11.79	226.20	6,617.66	146.12 S	192.86 W	504,368.28	726,328.44	0.16	-125.84	131.29	
6,642.00	11.79	226.20	6,619.62	146.40 S	193.15 W	504,368.00	726,328.15	0.00	-126.09	0.00	
6,644.00	11.80	226.19	6,621.57	146.69 S	193.45 W	504,367.71	726,327.85	0.28	-126.34	-11.67	
6,646.00	11.80	226.19	6,623.53	146.97 S	193.74 W	504,367.43	726,327.56	0.14	-126.60	-11.67	
6,648.00	11.80	226.19	6,625.49	147.25 S	194.04 W	504,367.15	726,327.26	0.14	-126.85	-11.66	
6,650.00	11.80	226.19	6,627.45	147.54 S	194.33 W	504,366.86	726,326.97	0.14	-127.10	-11.66	
6,652.00	11.81	226.18	6,629.40	147.82 S	194.63 W	504,366.58	726,326.67	0.14	-127.35	-11.66	
6,654.00	11.81	226.18	6,631.36	148.10 S	194.92 W	504,366.30	726,326.38	0.14	-127.60	-11.66	
6,656.00	11.81	226.18	6,633.32	148.39 S	195.22 W	504,366.01	726,326.08	0.14	-127.86	-11.65	
6,658.00	11.81	226.17	6,635.28	148.67 S	195.51 W	504,365.73	726,325.79	0.14	-128.11	-11.65	
6,660.00	11.82	226.17	6,637.24	148.95 S	195.81 W	504,365.45	726,325.49	0.14	-128.36	-11.65	
6,662.00	11.82	226.17	6,639.19	149.24 S	196.10 W	504,365.16	726,325.20	0.14	-128.61	-11.65	
6,664.00	11.82	226.17	6,641.15	149.52 S	196.40 W	504,364.88	726,324.90	0.14	-128.86	-11.64	

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				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
6,666.00	11.83	226.16	6,643.11	149.81 S	196.70 W	504,364.59	726,324.60	0.14	-129.12	-11.64	
6,668.00	11.83	226.16	6,645.07	150.09 S	196.99 W	504,364.31	726,324.31	0.14	-129.37	-11.64	
6,670.00	11.83	226.16	6,647.02	150.37 S	197.29 W	504,364.03	726,324.01	0.14	-129.62	-11.63	
6,672.00	11.83	226.16	6,648.98	150.66 S	197.58 W	504,363.74	726,323.72	0.14	-129.88	-11.63	
6,674.00	11.84	226.15	6,650.94	150.94 S	197.88 W	504,363.46	726,323.42	0.14	-130.13	-11.63	
6,676.00	11.84	226.15	6,652.90	151.23 S	198.17 W	504,363.17	726,323.13	0.14	-130.38	-11.63	
6,678.00	11.84	226.15	6,654.85	151.51 S	198.47 W	504,362.89	726,322.83	0.14	-130.63	-11.62	
6,680.00	11.85	226.14	6,656.81	151.79 S	198.77 W	504,362.61	726,322.53	0.14	-130.89	-11.62	
6,682.00	11.85	226.14	6,658.77	152.08 S	199.06 W	504,362.32	726,322.24	0.14	-131.14	-11.62	
6,684.00	11.85	226.14	6,660.73	152.36 S	199.36 W	504,362.04	726,321.94	0.14	-131.39	-11.62	
6,686.00	11.85	226.14	6,662.68	152.65 S	199.65 W	504,361.75	726,321.65	0.14	-131.65	-11.61	
6,688.00	11.86	226.13	6,664.64	152.93 S	199.95 W	504,361.47	726,321.35	0.14	-131.90	-11.61	
6,690.00	11.86	226.13	6,666.60	153.22 S	200.25 W	504,361.18	726,321.05	0.14	-132.15	-11.61	
6,692.00	11.86	226.13	6,668.55	153.50 S	200.54 W	504,360.90	726,320.76	0.14	-132.41	-11.60	
6,694.00	11.86	226.12	6,670.51	153.79 S	200.84 W	504,360.61	726,320.46	0.14	-132.66	-11.60	
6,696.00	11.87	226.12	6,672.47	154.07 S	201.14 W	504,360.33	726,320.16	0.14	-132.91	-11.60	
6,698.00	11.87	226.12	6,674.43	154.36 S	201.43 W	504,360.04	726,319.87	0.14	-133.17	-11.60	
6,700.00	11.87	226.12	6,676.38	154.64 S	201.73 W	504,359.76	726,319.57	0.14	-133.42	-11.59	
6,702.00	11.88	226.11	6,678.34	154.93 S	202.03 W	504,359.47	726,319.27	0.14	-133.67	-11.59	
6,704.00	11.88	226.11	6,680.30	155.21 S	202.32 W	504,359.19	726,318.98	0.14	-133.93	-11.59	
6,706.00	11.88	226.11	6,682.25	155.50 S	202.62 W	504,358.90	726,318.68	0.14	-134.18	-11.59	
6,708.00	11.88	226.11	6,684.21	155.78 S	202.92 W	504,358.62	726,318.38	0.14	-134.44	-11.58	
6,710.00	11.89	226.10	6,686.17	156.07 S	203.21 W	504,358.33	726,318.09	0.14	-134.69	-11.58	
6,712.00	11.89	226.10	6,688.13	156.36 S	203.51 W	504,358.04	726,317.79	0.14	-134.94	-11.58	
6,714.00	11.89	226.10	6,690.08	156.64 S	203.81 W	504,357.76	726,317.49	0.14	-135.20	-11.57	
6,716.00	11.90	226.09	6,692.04	156.93 S	204.10 W	504,357.47	726,317.20	0.14	-135.45	-11.57	
6,718.00	11.90	226.09	6,694.00	157.21 S	204.40 W	504,357.19	726,316.90	0.14	-135.71	-11.57	
6,720.00	11.90	226.09	6,695.95	157.50 S	204.70 W	504,356.90	726,316.60	0.14	-135.96	-11.57	
6,722.00	11.90	226.09	6,697.91	157.79 S	204.99 W	504,356.61	726,316.31	0.14	-136.22	-11.56	
6,724.00	11.91	226.08	6,699.87	158.07 S	205.29 W	504,356.33	726,316.01	0.14	-136.47	-11.56	
6,726.00	11.91	226.08	6,701.83	158.36 S	205.59 W	504,356.04	726,315.71	0.14	-136.73	-11.56	
6,728.00	11.91	226.08	6,703.78	158.64 S	205.89 W	504,355.76	726,315.41	0.14	-136.98	-11.56	
6,730.00	11.91	226.08	6,705.74	158.93 S	206.18 W	504,355.47	726,315.12	0.14	-137.23	-11.55	
6,732.00	11.92	226.07	6,707.70	159.22 S	206.48 W	504,355.18	726,314.82	0.14	-137.49	-11.55	
6,734.00	11.92	226.07	6,709.65	159.50 S	206.78 W	504,354.90	726,314.52	0.14	-137.74	-11.55	
6,736.00	11.92	226.07	6,711.61	159.79 S	207.08 W	504,354.61	726,314.22	0.00	-138.00	0.00	
6,738.00	11.92	226.07	6,713.57	160.08 S	207.37 W	504,354.32	726,313.93	0.00	-138.25	0.00	



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Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates (usft)		Map Coordinates (usft)		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing	Easting	Northing	Easting				
6,740.00	11.92	226.07	6,715.52	160.36 S	207.67 W	504,354.04	726,313.63	0.00	-138.51	0.00	
6,742.00	11.91	226.08	6,717.48	160.65 S	207.97 W	504,353.75	726,313.33	0.30	-138.76	165.21	
6,744.00	11.91	226.08	6,719.44	160.94 S	208.27 W	504,353.46	726,313.03	0.08	-139.02	165.21	
6,746.00	11.91	226.08	6,721.39	161.22 S	208.56 W	504,353.18	726,312.74	0.08	-139.27	165.20	
6,748.00	11.91	226.08	6,723.35	161.51 S	208.86 W	504,352.89	726,312.44	0.08	-139.53	165.20	
6,750.00	11.91	226.09	6,725.31	161.80 S	209.16 W	504,352.60	726,312.14	0.08	-139.78	165.20	
6,752.00	11.91	226.09	6,727.27	162.08 S	209.46 W	504,352.32	726,311.84	0.08	-140.04	165.20	
6,754.00	11.91	226.09	6,729.22	162.37 S	209.75 W	504,352.03	726,311.55	0.08	-140.29	165.20	
6,756.00	11.90	226.09	6,731.18	162.65 S	210.05 W	504,351.75	726,311.25	0.08	-140.55	165.19	
6,758.00	11.90	226.09	6,733.14	162.94 S	210.35 W	504,351.46	726,310.95	0.08	-140.80	165.19	
6,760.00	11.90	226.09	6,735.09	163.23 S	210.64 W	504,351.17	726,310.66	0.08	-141.06	165.19	
6,762.00	11.90	226.10	6,737.05	163.51 S	210.94 W	504,350.89	726,310.36	0.08	-141.31	165.19	
6,764.00	11.90	226.10	6,739.01	163.80 S	211.24 W	504,350.60	726,310.06	0.08	-141.56	165.19	
6,766.00	11.90	226.10	6,740.96	164.08 S	211.54 W	504,350.32	726,309.76	0.08	-141.82	165.19	
6,768.00	11.89	226.10	6,742.92	164.37 S	211.83 W	504,350.03	726,309.47	0.08	-142.07	165.18	
6,770.00	11.89	226.10	6,744.88	164.66 S	212.13 W	504,349.74	726,309.17	0.08	-142.33	165.18	
6,772.00	11.89	226.11	6,746.84	164.94 S	212.43 W	504,349.46	726,308.87	0.08	-142.58	165.18	
6,774.00	11.89	226.11	6,748.79	165.23 S	212.72 W	504,349.17	726,308.58	0.08	-142.84	165.18	
6,776.00	11.89	226.11	6,750.75	165.51 S	213.02 W	504,348.89	726,308.28	0.08	-143.09	165.18	
6,778.00	11.89	226.11	6,752.71	165.80 S	213.32 W	504,348.60	726,307.98	0.08	-143.34	165.17	
6,780.00	11.89	226.11	6,754.66	166.08 S	213.61 W	504,348.32	726,307.69	0.08	-143.60	165.17	
6,782.00	11.88	226.12	6,756.62	166.37 S	213.91 W	504,348.03	726,307.39	0.08	-143.85	165.17	
6,784.00	11.88	226.12	6,758.58	166.65 S	214.21 W	504,347.75	726,307.09	0.08	-144.11	165.17	
6,786.00	11.88	226.12	6,760.54	166.94 S	214.51 W	504,347.46	726,306.79	0.08	-144.36	165.17	
6,788.00	11.88	226.12	6,762.49	167.23 S	214.80 W	504,347.17	726,306.50	0.08	-144.61	165.16	
6,790.00	11.88	226.12	6,764.45	167.51 S	215.10 W	504,346.89	726,306.20	0.08	-144.87	165.16	
6,792.00	11.88	226.12	6,766.41	167.80 S	215.40 W	504,346.60	726,305.90	0.08	-145.12	165.16	
6,794.00	11.88	226.13	6,768.36	168.08 S	215.69 W	504,346.32	726,305.61	0.08	-145.38	165.16	
6,796.00	11.87	226.13	6,770.32	168.37 S	215.99 W	504,346.03	726,305.31	0.08	-145.63	165.16	
6,798.00	11.87	226.13	6,772.28	168.65 S	216.29 W	504,345.75	726,305.01	0.08	-145.88	165.16	
6,800.00	11.87	226.13	6,774.24	168.94 S	216.58 W	504,345.46	726,304.72	0.08	-146.14	165.15	
6,802.00	11.87	226.13	6,776.19	169.22 S	216.88 W	504,345.18	726,304.42	0.08	-146.39	165.15	
6,804.00	11.87	226.14	6,778.15	169.51 S	217.18 W	504,344.89	726,304.12	0.08	-146.64	165.15	
6,806.00	11.87	226.14	6,780.11	169.79 S	217.47 W	504,344.61	726,303.83	0.08	-146.90	165.15	
6,808.00	11.87	226.14	6,782.06	170.08 S	217.77 W	504,344.32	726,303.53	0.08	-147.15	165.15	
6,810.00	11.86	226.14	6,784.02	170.36 S	218.06 W	504,344.04	726,303.24	0.08	-147.40	165.14	
6,812.00	11.86	226.14	6,785.98	170.65 S	218.36 W	504,343.75	726,302.94	0.08	-147.66	165.14	

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Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
6,814.00	11.86	226.15	6,787.94	170.93 S	218.66 W	504,343.47	726,302.64	0.08	-147.91	165.14	
6,816.00	11.86	226.15	6,789.89	171.22 S	218.95 W	504,343.18	726,302.35	0.08	-148.16	165.14	
6,818.00	11.86	226.15	6,791.85	171.50 S	219.25 W	504,342.90	726,302.05	0.08	-148.42	165.14	
6,820.00	11.86	226.15	6,793.81	171.79 S	219.55 W	504,342.61	726,301.75	0.08	-148.67	165.14	
6,822.00	11.86	226.15	6,795.77	172.07 S	219.84 W	504,342.33	726,301.46	0.08	-148.92	165.13	
6,824.00	11.85	226.16	6,797.72	172.36 S	220.14 W	504,342.04	726,301.16	0.08	-149.18	165.13	
6,826.00	11.85	226.16	6,799.68	172.64 S	220.44 W	504,341.76	726,300.86	0.08	-149.43	165.13	
6,828.00	11.85	226.16	6,801.64	172.92 S	220.73 W	504,341.48	726,300.57	0.08	-149.68	165.13	
6,830.00	11.85	226.16	6,803.60	173.21 S	221.03 W	504,341.19	726,300.27	0.04	-149.94	165.13	
6,832.00	11.85	226.16	6,805.55	173.49 S	221.32 W	504,340.91	726,299.98	0.00	-150.19	0.00	
6,834.00	11.85	226.16	6,807.51	173.78 S	221.62 W	504,340.62	726,299.68	0.00	-150.44	0.00	
6,836.00	11.85	226.16	6,809.47	174.06 S	221.92 W	504,340.34	726,299.38	0.00	-150.70	0.00	
6,838.00	11.85	226.16	6,811.42	174.35 S	222.21 W	504,340.05	726,299.09	0.00	-150.95	0.00	
6,840.00	11.84	226.15	6,813.38	174.63 S	222.51 W	504,339.77	726,298.79	0.30	-151.20	-168.44	
6,842.00	11.84	226.15	6,815.34	174.92 S	222.80 W	504,339.48	726,298.50	0.05	-151.45	-168.44	
6,844.00	11.84	226.15	6,817.30	175.20 S	223.10 W	504,339.20	726,298.20	0.05	-151.71	-168.44	
6,846.00	11.84	226.15	6,819.25	175.48 S	223.40 W	504,338.92	726,297.90	0.05	-151.96	-168.44	
6,848.00	11.84	226.15	6,821.21	175.77 S	223.69 W	504,338.63	726,297.61	0.05	-152.21	-168.43	
6,850.00	11.84	226.15	6,823.17	176.05 S	223.99 W	504,338.35	726,297.31	0.05	-152.47	-168.43	
6,852.00	11.84	226.15	6,825.13	176.34 S	224.28 W	504,338.06	726,297.02	0.05	-152.72	-168.43	
6,854.00	11.84	226.15	6,827.08	176.62 S	224.58 W	504,337.78	726,296.72	0.05	-152.97	-168.43	
6,856.00	11.84	226.15	6,829.04	176.91 S	224.88 W	504,337.49	726,296.42	0.05	-153.22	-168.43	
6,858.00	11.83	226.14	6,831.00	177.19 S	225.17 W	504,337.21	726,296.13	0.05	-153.48	-168.43	
6,860.00	11.83	226.14	6,832.96	177.47 S	225.47 W	504,336.93	726,295.83	0.05	-153.73	-168.43	
6,862.00	11.83	226.14	6,834.91	177.76 S	225.76 W	504,336.64	726,295.54	0.05	-153.98	-168.43	
6,864.00	11.83	226.14	6,836.87	178.04 S	226.06 W	504,336.36	726,295.24	0.05	-154.23	-168.43	
6,866.00	11.83	226.14	6,838.83	178.33 S	226.35 W	504,336.07	726,294.95	0.05	-154.49	-168.43	
6,868.00	11.83	226.14	6,840.79	178.61 S	226.65 W	504,335.79	726,294.65	0.05	-154.74	-168.42	
6,870.00	11.83	226.14	6,842.74	178.89 S	226.95 W	504,335.51	726,294.35	0.05	-154.99	-168.42	
6,872.00	11.83	226.14	6,844.70	179.18 S	227.24 W	504,335.22	726,294.06	0.05	-155.25	-168.42	
6,874.00	11.83	226.14	6,846.66	179.46 S	227.54 W	504,334.94	726,293.76	0.05	-155.50	-168.42	
6,876.00	11.82	226.14	6,848.62	179.75 S	227.83 W	504,334.65	726,293.47	0.05	-155.75	-168.42	
6,878.00	11.82	226.13	6,850.57	180.03 S	228.13 W	504,334.37	726,293.17	0.05	-156.00	-168.42	
6,880.00	11.82	226.13	6,852.53	180.31 S	228.42 W	504,334.09	726,292.88	0.05	-156.26	-168.42	
6,882.00	11.82	226.13	6,854.49	180.60 S	228.72 W	504,333.80	726,292.58	0.05	-156.51	-168.42	
6,884.00	11.82	226.13	6,856.45	180.88 S	229.01 W	504,333.52	726,292.29	0.05	-156.76	-168.42	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
6,886.00	11.82	226.13	6,858.41	181.17 S	229.31 W	504,333.23	726,291.99	0.05	-157.01	-168.41	
6,888.00	11.82	226.13	6,860.36	181.45 S	229.61 W	504,332.95	726,291.69	0.05	-157.27	-168.41	
6,890.00	11.82	226.13	6,862.32	181.73 S	229.90 W	504,332.67	726,291.40	0.05	-157.52	-168.41	
6,892.00	11.82	226.13	6,864.28	182.02 S	230.20 W	504,332.38	726,291.10	0.05	-157.77	-168.41	
6,894.00	11.82	226.13	6,866.24	182.30 S	230.49 W	504,332.10	726,290.81	0.05	-158.02	-168.41	
6,896.00	11.81	226.12	6,868.19	182.59 S	230.79 W	504,331.81	726,290.51	0.05	-158.28	-168.41	
6,898.00	11.81	226.12	6,870.15	182.87 S	231.08 W	504,331.53	726,290.22	0.05	-158.53	-168.41	
6,900.00	11.81	226.12	6,872.11	183.15 S	231.38 W	504,331.25	726,289.92	0.05	-158.78	-168.41	
6,902.00	11.81	226.12	6,874.07	183.44 S	231.67 W	504,330.96	726,289.63	0.05	-159.03	-168.41	
6,904.00	11.81	226.12	6,876.02	183.72 S	231.97 W	504,330.68	726,289.33	0.05	-159.29	-168.41	
6,906.00	11.81	226.12	6,877.98	184.00 S	232.26 W	504,330.40	726,289.04	0.05	-159.54	-168.40	
6,908.00	11.81	226.12	6,879.94	184.29 S	232.56 W	504,330.11	726,288.74	0.05	-159.79	-168.40	
6,910.00	11.81	226.12	6,881.90	184.57 S	232.85 W	504,329.83	726,288.45	0.05	-160.04	-168.40	
6,912.00	11.81	226.12	6,883.85	184.86 S	233.15 W	504,329.54	726,288.15	0.05	-160.30	-168.40	
6,914.00	11.80	226.11	6,885.81	185.14 S	233.44 W	504,329.26	726,287.86	0.05	-160.55	-168.40	
6,916.00	11.80	226.11	6,887.77	185.42 S	233.74 W	504,328.98	726,287.56	0.05	-160.80	-168.40	
6,918.00	11.80	226.11	6,889.73	185.71 S	234.03 W	504,328.69	726,287.27	0.05	-161.05	-168.40	
6,920.00	11.80	226.11	6,891.69	185.99 S	234.33 W	504,328.41	726,286.97	0.05	-161.30	-168.40	
6,922.00	11.80	226.11	6,893.64	186.27 S	234.62 W	504,328.13	726,286.68	0.05	-161.56	-168.40	
6,924.00	11.80	226.14	6,895.60	186.56 S	234.92 W	504,327.84	726,286.38	0.32	-161.81	57.38	
6,926.00	11.81	226.19	6,897.56	186.84 S	235.21 W	504,327.56	726,286.09	0.68	-162.06	54.08	
6,928.00	11.82	226.24	6,899.52	187.12 S	235.51 W	504,327.28	726,285.79	0.68	-162.31	54.02	
6,930.00	11.83	226.30	6,901.47	187.41 S	235.80 W	504,326.99	726,285.50	0.68	-162.57	53.97	
6,932.00	11.84	226.35	6,903.43	187.69 S	236.10 W	504,326.71	726,285.20	0.68	-162.82	53.92	
6,934.00	11.84	226.41	6,905.39	187.97 S	236.40 W	504,326.43	726,284.90	0.68	-163.07	53.87	
6,936.00	11.85	226.46	6,907.35	188.26 S	236.69 W	504,326.14	726,284.61	0.68	-163.32	53.81	
6,938.00	11.86	226.51	6,909.30	188.54 S	236.99 W	504,325.86	726,284.31	0.68	-163.57	53.76	
6,940.00	11.87	226.57	6,911.26	188.82 S	237.29 W	504,325.58	726,284.01	0.68	-163.82	53.71	
6,942.00	11.88	226.62	6,913.22	189.10 S	237.59 W	504,325.30	726,283.71	0.68	-164.07	53.66	
6,944.00	11.88	226.67	6,915.17	189.39 S	237.89 W	504,325.01	726,283.41	0.68	-164.32	53.61	
6,946.00	11.89	226.73	6,917.13	189.67 S	238.19 W	504,324.73	726,283.11	0.68	-164.57	53.55	
6,948.00	11.90	226.78	6,919.09	189.95 S	238.49 W	504,324.45	726,282.81	0.68	-164.83	53.50	
6,950.00	11.91	226.83	6,921.05	190.23 S	238.79 W	504,324.17	726,282.51	0.68	-165.08	53.45	
6,952.00	11.92	226.88	6,923.00	190.52 S	239.09 W	504,323.88	726,282.21	0.68	-165.33	53.40	
6,954.00	11.92	226.94	6,924.96	190.80 S	239.39 W	504,323.60	726,281.91	0.68	-165.58	53.35	
6,956.00	11.93	226.99	6,926.92	191.08 S	239.69 W	504,323.32	726,281.61	0.68	-165.83	53.29	
6,958.00	11.94	227.04	6,928.87	191.36 S	240.00 W	504,323.04	726,281.30	0.68	-166.08	53.24	

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Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
6,960.00	11.95	227.09	6,930.83	191.65 S	240.30 W	504,322.75	726,281.00	0.68	-166.33	53.19	
6,962.00	11.96	227.15	6,932.79	191.93 S	240.60 W	504,322.47	726,280.70	0.68	-166.58	53.14	
6,964.00	11.97	227.20	6,934.74	192.21 S	240.91 W	504,322.19	726,280.39	0.68	-166.83	53.09	
6,966.00	11.97	227.25	6,936.70	192.49 S	241.21 W	504,321.91	726,280.09	0.68	-167.07	53.04	
6,968.00	11.98	227.30	6,938.66	192.77 S	241.52 W	504,321.63	726,279.78	0.68	-167.32	52.99	
6,970.00	11.99	227.36	6,940.61	193.05 S	241.82 W	504,321.35	726,279.48	0.68	-167.57	52.93	
6,972.00	12.00	227.41	6,942.57	193.34 S	242.13 W	504,321.06	726,279.17	0.68	-167.82	52.88	
6,974.00	12.01	227.46	6,944.53	193.62 S	242.43 W	504,320.78	726,278.87	0.68	-168.07	52.83	
6,976.00	12.01	227.51	6,946.48	193.90 S	242.74 W	504,320.50	726,278.56	0.68	-168.32	52.78	
6,978.00	12.02	227.57	6,948.44	194.18 S	243.05 W	504,320.22	726,278.25	0.68	-168.57	52.73	
6,980.00	12.03	227.62	6,950.39	194.46 S	243.36 W	504,319.94	726,277.94	0.68	-168.82	52.68	
6,982.00	12.04	227.67	6,952.35	194.74 S	243.66 W	504,319.66	726,277.64	0.68	-169.07	52.63	
6,984.00	12.05	227.72	6,954.31	195.02 S	243.97 W	504,319.38	726,277.33	0.68	-169.31	52.58	
6,986.00	12.06	227.77	6,956.26	195.30 S	244.28 W	504,319.10	726,277.02	0.68	-169.56	52.53	
6,988.00	12.06	227.82	6,958.22	195.58 S	244.59 W	504,318.82	726,276.71	0.68	-169.81	52.48	
6,990.00	12.07	227.88	6,960.17	195.86 S	244.90 W	504,318.54	726,276.40	0.68	-170.06	52.43	
6,992.00	12.08	227.93	6,962.13	196.14 S	245.21 W	504,318.26	726,276.09	0.68	-170.30	52.38	
6,994.00	12.09	227.98	6,964.08	196.42 S	245.52 W	504,317.98	726,275.78	0.68	-170.55	52.33	
6,996.00	12.10	228.03	6,966.04	196.71 S	245.83 W	504,317.69	726,275.47	0.68	-170.80	52.28	
6,998.00	12.11	228.08	6,968.00	196.99 S	246.15 W	504,317.41	726,275.15	0.68	-171.05	52.23	
7,000.00	12.11	228.13	6,969.95	197.27 S	246.46 W	504,317.13	726,274.84	0.68	-171.29	52.17	
7,002.00	12.12	228.18	6,971.91	197.55 S	246.77 W	504,316.85	726,274.53	0.68	-171.54	52.12	
7,004.00	12.13	228.23	6,973.86	197.83 S	247.09 W	504,316.57	726,274.21	0.68	-171.79	52.07	
7,006.00	12.14	228.29	6,975.82	198.11 S	247.40 W	504,316.29	726,273.90	0.68	-172.03	52.02	
7,008.00	12.15	228.34	6,977.77	198.39 S	247.71 W	504,316.01	726,273.59	0.68	-172.28	51.98	
7,010.00	12.16	228.39	6,979.73	198.67 S	248.03 W	504,315.73	726,273.27	0.68	-172.53	51.93	
7,012.00	12.16	228.44	6,981.68	198.94 S	248.34 W	504,315.46	726,272.96	0.68	-172.77	51.88	
7,014.00	12.17	228.49	6,983.64	199.22 S	248.66 W	504,315.18	726,272.64	0.68	-173.02	51.83	
7,016.00	12.18	228.54	6,985.59	199.50 S	248.97 W	504,314.90	726,272.33	0.68	-173.27	51.78	
7,018.00	12.19	228.59	6,987.55	199.78 S	249.29 W	504,314.62	726,272.01	0.68	-173.51	51.73	
7,020.00	12.19	228.56	6,989.50	200.06 S	249.61 W	504,314.34	726,271.69	0.39	-173.76	-129.02	
7,022.00	12.18	228.53	6,991.46	200.34 S	249.92 W	504,314.06	726,271.38	0.39	-174.00	-128.99	
7,024.00	12.18	228.50	6,993.41	200.62 S	250.24 W	504,313.78	726,271.06	0.39	-174.25	-128.96	
7,026.00	12.17	228.47	6,995.37	200.90 S	250.56 W	504,313.50	726,270.74	0.39	-174.50	-128.94	
7,028.00	12.17	228.44	6,997.32	201.18 S	250.87 W	504,313.22	726,270.43	0.39	-174.74	-128.91	
7,030.00	12.16	228.42	6,999.28	201.46 S	251.19 W	504,312.94	726,270.11	0.39	-174.99	-128.88	
7,032.00	12.16	228.39	7,001.23	201.74 S	251.50 W	504,312.66	726,269.80	0.39	-175.23	-128.85	

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Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
7,034.00	12.15	228.36	7,003.19	202.02 S	251.82 W	504,312.38	726,269.48	0.39	-175.48	-128.82	
7,036.00	12.15	228.33	7,005.14	202.30 S	252.13 W	504,312.10	726,269.17	0.39	-175.73	-128.79	
7,038.00	12.14	228.30	7,007.10	202.58 S	252.44 W	504,311.82	726,268.86	0.39	-175.97	-128.77	
7,040.00	12.14	228.27	7,009.05	202.86 S	252.76 W	504,311.54	726,268.54	0.39	-176.22	-128.74	
7,042.00	12.13	228.24	7,011.01	203.14 S	253.07 W	504,311.26	726,268.23	0.39	-176.47	-128.71	
7,044.00	12.13	228.21	7,012.96	203.42 S	253.39 W	504,310.98	726,267.91	0.39	-176.71	-128.68	
7,046.00	12.12	228.18	7,014.92	203.70 S	253.70 W	504,310.70	726,267.60	0.39	-176.96	-128.65	
7,048.00	12.12	228.15	7,016.88	203.98 S	254.01 W	504,310.42	726,267.29	0.39	-177.21	-128.62	
7,050.00	12.11	228.12	7,018.83	204.26 S	254.32 W	504,310.14	726,266.98	0.39	-177.45	-128.59	
7,052.00	12.11	228.09	7,020.79	204.54 S	254.64 W	504,309.86	726,266.66	0.39	-177.70	-128.56	
7,054.00	12.10	228.06	7,022.74	204.82 S	254.95 W	504,309.58	726,266.35	0.39	-177.95	-128.54	
7,056.00	12.10	228.03	7,024.70	205.10 S	255.26 W	504,309.30	726,266.04	0.39	-178.20	-128.51	
7,058.00	12.09	228.00	7,026.65	205.38 S	255.57 W	504,309.02	726,265.73	0.39	-178.44	-128.48	
7,060.00	12.09	227.98	7,028.61	205.66 S	255.88 W	504,308.74	726,265.42	0.39	-178.69	-128.45	
7,062.00	12.08	227.95	7,030.56	205.94 S	256.19 W	504,308.46	726,265.11	0.39	-178.94	-128.42	
7,064.00	12.08	227.92	7,032.52	206.22 S	256.50 W	504,308.18	726,264.80	0.39	-179.19	-128.39	
7,066.00	12.07	227.89	7,034.48	206.50 S	256.82 W	504,307.90	726,264.48	0.39	-179.43	-128.36	
7,068.00	12.07	227.86	7,036.43	206.78 S	257.13 W	504,307.62	726,264.17	0.39	-179.68	-128.33	
7,070.00	12.06	227.83	7,038.39	207.06 S	257.44 W	504,307.34	726,263.86	0.39	-179.93	-128.31	
7,072.00	12.06	227.80	7,040.34	207.34 S	257.74 W	504,307.06	726,263.56	0.39	-180.18	-128.28	
7,074.00	12.05	227.77	7,042.30	207.62 S	258.05 W	504,306.78	726,263.25	0.39	-180.42	-128.25	
7,076.00	12.05	227.74	7,044.26	207.90 S	258.36 W	504,306.50	726,262.94	0.39	-180.67	-128.22	
7,078.00	12.04	227.71	7,046.21	208.19 S	258.67 W	504,306.21	726,262.63	0.39	-180.92	-128.19	
7,080.00	12.04	227.68	7,048.17	208.47 S	258.98 W	504,305.93	726,262.32	0.39	-181.17	-128.16	
7,082.00	12.03	227.65	7,050.12	208.75 S	259.29 W	504,305.65	726,262.01	0.39	-181.42	-128.13	
7,084.00	12.03	227.62	7,052.08	209.03 S	259.60 W	504,305.37	726,261.70	0.39	-181.67	-128.10	
7,086.00	12.02	227.59	7,054.04	209.31 S	259.90 W	504,305.09	726,261.40	0.39	-181.91	-128.07	
7,088.00	12.02	227.56	7,055.99	209.59 S	260.21 W	504,304.81	726,261.09	0.39	-182.16	-128.04	
7,090.00	12.01	227.53	7,057.95	209.87 S	260.52 W	504,304.53	726,260.78	0.39	-182.41	-128.01	
7,092.00	12.01	227.50	7,059.90	210.15 S	260.83 W	504,304.25	726,260.47	0.39	-182.66	-127.99	
7,094.00	12.00	227.47	7,061.86	210.43 S	261.13 W	504,303.97	726,260.17	0.39	-182.91	-127.96	
7,096.00	12.00	227.44	7,063.82	210.71 S	261.44 W	504,303.69	726,259.86	0.39	-183.16	-127.93	
7,098.00	11.99	227.41	7,065.77	211.00 S	261.75 W	504,303.40	726,259.55	0.39	-183.41	-127.90	
7,100.00	11.99	227.38	7,067.73	211.28 S	262.05 W	504,303.12	726,259.25	0.39	-183.65	-127.87	
7,102.00	11.98	227.35	7,069.69	211.56 S	262.36 W	504,302.84	726,258.94	0.39	-183.90	-127.84	
7,104.00	11.98	227.32	7,071.64	211.84 S	262.66 W	504,302.56	726,258.64	0.39	-184.15	-127.81	

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				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
7,106.00	11.97	227.29	7,073.60	212.12 S	262.97 W	504,302.28	726,258.33	0.39	-184.40	-127.78	
7,108.00	11.97	227.26	7,075.56	212.40 S	263.27 W	504,302.00	726,258.03	0.39	-184.65	-127.75	
7,110.00	11.96	227.23	7,077.51	212.68 S	263.58 W	504,301.72	726,257.72	0.39	-184.90	-127.72	
7,112.00	11.96	227.20	7,079.47	212.97 S	263.88 W	504,301.43	726,257.42	0.39	-185.15	-127.69	
7,114.00	11.96	227.18	7,081.42	213.25 S	264.18 W	504,301.15	726,257.12	0.27	-185.40	-105.95	
7,116.00	11.96	227.15	7,083.38	213.53 S	264.49 W	504,300.87	726,256.81	0.27	-185.65	-105.93	
7,118.00	11.96	227.13	7,085.34	213.81 S	264.79 W	504,300.59	726,256.51	0.27	-185.90	-105.90	
7,120.00	11.95	227.10	7,087.29	214.09 S	265.10 W	504,300.31	726,256.20	0.27	-186.15	-105.88	
7,122.00	11.95	227.08	7,089.25	214.37 S	265.40 W	504,300.03	726,255.90	0.27	-186.40	-105.85	
7,124.00	11.95	227.05	7,091.21	214.66 S	265.70 W	504,299.74	726,255.60	0.27	-186.65	-105.83	
7,126.00	11.95	227.03	7,093.16	214.94 S	266.01 W	504,299.46	726,255.29	0.27	-186.90	-105.80	
7,128.00	11.95	227.00	7,095.12	215.22 S	266.31 W	504,299.18	726,254.99	0.27	-187.15	-105.78	
7,130.00	11.95	226.98	7,097.08	215.50 S	266.61 W	504,298.90	726,254.69	0.27	-187.40	-105.76	
7,132.00	11.95	226.95	7,099.03	215.79 S	266.91 W	504,298.61	726,254.39	0.27	-187.65	-105.73	
7,134.00	11.94	226.93	7,100.99	216.07 S	267.22 W	504,298.33	726,254.08	0.27	-187.90	-105.71	
7,136.00	11.94	226.90	7,102.95	216.35 S	267.52 W	504,298.05	726,253.78	0.27	-188.15	-105.68	
7,138.00	11.94	226.88	7,104.90	216.63 S	267.82 W	504,297.77	726,253.48	0.27	-188.40	-105.66	
7,140.00	11.94	226.85	7,106.86	216.92 S	268.12 W	504,297.48	726,253.18	0.27	-188.65	-105.63	
7,142.00	11.94	226.83	7,108.82	217.20 S	268.42 W	504,297.20	726,252.88	0.27	-188.90	-105.61	
7,144.00	11.94	226.80	7,110.78	217.48 S	268.73 W	504,296.92	726,252.57	0.27	-189.15	-105.58	
7,146.00	11.94	226.78	7,112.73	217.77 S	269.03 W	504,296.63	726,252.27	0.27	-189.40	-105.56	
7,148.00	11.93	226.75	7,114.69	218.05 S	269.33 W	504,296.35	726,251.97	0.27	-189.66	-105.54	
7,150.00	11.93	226.73	7,116.65	218.33 S	269.63 W	504,296.07	726,251.67	0.27	-189.91	-105.51	
7,152.00	11.93	226.70	7,118.60	218.62 S	269.93 W	504,295.78	726,251.37	0.27	-190.16	-105.49	
7,154.00	11.93	226.68	7,120.56	218.90 S	270.23 W	504,295.50	726,251.07	0.27	-190.41	-105.46	
7,156.00	11.93	226.65	7,122.52	219.18 S	270.53 W	504,295.22	726,250.77	0.27	-190.66	-105.44	
7,158.00	11.93	226.63	7,124.47	219.47 S	270.83 W	504,294.93	726,250.47	0.27	-190.91	-105.41	
7,160.00	11.93	226.60	7,126.43	219.75 S	271.13 W	504,294.65	726,250.17	0.27	-191.17	-105.39	
7,162.00	11.92	226.58	7,128.39	220.04 S	271.43 W	504,294.36	726,249.87	0.27	-191.42	-105.36	
7,164.00	11.92	226.55	7,130.34	220.32 S	271.73 W	504,294.08	726,249.57	0.27	-191.67	-105.34	
7,166.00	11.92	226.53	7,132.30	220.60 S	272.03 W	504,293.80	726,249.27	0.27	-191.92	-105.32	
7,168.00	11.92	226.50	7,134.26	220.89 S	272.33 W	504,293.51	726,248.97	0.27	-192.18	-105.29	
7,170.00	11.92	226.48	7,136.21	221.17 S	272.63 W	504,293.23	726,248.67	0.27	-192.43	-105.27	
7,172.00	11.92	226.45	7,138.17	221.46 S	272.93 W	504,292.94	726,248.37	0.27	-192.68	-105.24	
7,174.00	11.92	226.43	7,140.13	221.74 S	273.23 W	504,292.66	726,248.07	0.27	-192.93	-105.22	
7,176.00	11.91	226.40	7,142.08	222.03 S	273.53 W	504,292.37	726,247.77	0.27	-193.19	-105.19	
7,178.00	11.91	226.38	7,144.04	222.31 S	273.83 W	504,292.09	726,247.47	0.27	-193.44	-105.17	

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				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
7,180.00	11.91	226.35	7,146.00	222.60 S	274.13 W	504,291.80	726,247.17	0.27	-193.69	-105.14	
7,182.00	11.91	226.33	7,147.96	222.88 S	274.43 W	504,291.52	726,246.87	0.27	-193.95	-105.12	
7,184.00	11.91	226.30	7,149.91	223.17 S	274.72 W	504,291.23	726,246.58	0.27	-194.20	-105.09	
7,186.00	11.91	226.28	7,151.87	223.45 S	275.02 W	504,290.95	726,246.28	0.27	-194.45	-105.07	
7,188.00	11.91	226.25	7,153.83	223.74 S	275.32 W	504,290.66	726,245.98	0.27	-194.71	-105.05	
7,190.00	11.90	226.23	7,155.78	224.02 S	275.62 W	504,290.38	726,245.68	0.27	-194.96	-105.02	
7,192.00	11.90	226.20	7,157.74	224.31 S	275.92 W	504,290.09	726,245.38	0.27	-195.21	-105.00	
7,194.00	11.90	226.17	7,159.70	224.59 S	276.21 W	504,289.81	726,245.09	0.27	-195.47	-104.97	
7,196.00	11.90	226.15	7,161.65	224.88 S	276.51 W	504,289.52	726,244.79	0.27	-195.72	-104.95	
7,198.00	11.90	226.12	7,163.61	225.16 S	276.81 W	504,289.24	726,244.49	0.27	-195.98	-104.92	
7,200.00	11.90	226.10	7,165.57	225.45 S	277.11 W	504,288.95	726,244.19	0.27	-196.23	-104.90	
7,202.00	11.90	226.07	7,167.53	225.74 S	277.40 W	504,288.66	726,243.90	0.27	-196.48	-104.87	
7,204.00	11.89	226.05	7,169.48	226.02 S	277.70 W	504,288.38	726,243.60	0.27	-196.74	-104.85	
7,206.00	11.89	226.02	7,171.44	226.31 S	278.00 W	504,288.09	726,243.30	0.27	-196.99	-104.82	
7,208.00	11.89	226.00	7,173.40	226.59 S	278.29 W	504,287.81	726,243.01	0.27	-197.25	-104.80	
7,210.00	11.89	225.97	7,175.35	226.88 S	278.59 W	504,287.52	726,242.71	0.27	-197.50	-104.78	
7,212.00	11.89	225.95	7,177.31	227.17 S	278.89 W	504,287.23	726,242.41	0.27	-197.76	-104.75	
7,214.00	11.89	225.92	7,179.27	227.45 S	279.18 W	504,286.95	726,242.12	0.27	-198.01	-104.73	
7,216.00	11.89	225.90	7,181.22	227.74 S	279.48 W	504,286.66	726,241.82	0.27	-198.27	-104.70	
7,218.00	11.88	225.87	7,183.18	228.03 S	279.77 W	504,286.37	726,241.53	0.27	-198.52	-104.68	
7,220.00	11.88	225.85	7,185.14	228.31 S	280.07 W	504,286.09	726,241.23	0.27	-198.78	-104.65	
7,222.00	11.88	225.82	7,187.10	228.60 S	280.37 W	504,285.80	726,240.93	0.27	-199.04	-104.63	
7,224.00	11.88	225.80	7,189.05	228.89 S	280.66 W	504,285.51	726,240.64	0.27	-199.29	-104.60	
7,226.00	11.88	225.77	7,191.01	229.18 S	280.96 W	504,285.22	726,240.34	0.27	-199.55	-104.58	
7,228.00	11.88	225.75	7,192.97	229.46 S	281.25 W	504,284.94	726,240.05	0.27	-199.80	-104.55	
7,230.00	11.88	225.72	7,194.92	229.75 S	281.55 W	504,284.65	726,239.75	0.27	-200.06	-104.53	
7,232.00	11.88	225.70	7,196.88	230.04 S	281.84 W	504,284.36	726,239.46	0.27	-200.31	-104.50	
7,234.00	11.87	225.67	7,198.84	230.32 S	282.13 W	504,284.08	726,239.17	0.27	-200.57	-104.48	
7,236.00	11.87	225.65	7,200.80	230.61 S	282.43 W	504,283.79	726,238.87	0.27	-200.83	-104.45	
7,238.00	11.87	225.62	7,202.75	230.90 S	282.72 W	504,283.50	726,238.58	0.27	-201.08	-104.43	
7,240.00	11.87	225.60	7,204.71	231.19 S	283.02 W	504,283.21	726,238.28	0.27	-201.34	-104.41	
7,242.00	11.87	225.57	7,206.67	231.48 S	283.31 W	504,282.92	726,237.99	0.27	-201.60	-104.38	
7,244.00	11.87	225.54	7,208.63	231.76 S	283.60 W	504,282.64	726,237.70	0.27	-201.85	-104.36	
7,246.00	11.87	225.52	7,210.58	232.05 S	283.90 W	504,282.35	726,237.40	0.27	-202.11	-104.33	
7,248.00	11.86	225.49	7,212.54	232.34 S	284.19 W	504,282.06	726,237.11	0.27	-202.37	-104.31	
7,250.00	11.86	225.47	7,214.50	232.63 S	284.48 W	504,281.77	726,236.82	0.27	-202.62	-104.28	
7,252.00	11.86	225.44	7,216.45	232.92 S	284.78 W	504,281.48	726,236.52	0.27	-202.88	-104.26	

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Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
7,254.00	11.86	225.42	7,218.41	233.21 S	285.07 W	504,281.19	726,236.23	0.27	-203.14	-104.23	
7,256.00	11.86	225.39	7,220.37	233.49 S	285.36 W	504,280.91	726,235.94	0.27	-203.40	-104.21	
7,258.00	11.86	225.37	7,222.33	233.78 S	285.66 W	504,280.62	726,235.64	0.27	-203.65	-104.18	
7,260.00	11.86	225.34	7,224.28	234.07 S	285.95 W	504,280.33	726,235.35	0.27	-203.91	-104.16	
7,262.00	11.86	225.32	7,226.24	234.36 S	286.24 W	504,280.04	726,235.06	0.27	-204.17	-104.13	
7,264.00	11.85	225.29	7,228.20	234.65 S	286.53 W	504,279.75	726,234.77	0.27	-204.43	-104.11	
7,266.00	11.85	225.27	7,230.16	234.94 S	286.82 W	504,279.46	726,234.48	0.27	-204.69	-104.08	
7,268.00	11.85	225.24	7,232.11	235.23 S	287.12 W	504,279.17	726,234.18	0.27	-204.94	-104.06	
7,270.00	11.85	225.22	7,234.07	235.52 S	287.41 W	504,278.88	726,233.89	0.27	-205.20	-104.03	
7,272.00	11.85	225.19	7,236.03	235.81 S	287.70 W	504,278.59	726,233.60	0.27	-205.46	-104.01	
7,274.00	11.85	225.17	7,237.99	236.10 S	287.99 W	504,278.30	726,233.31	0.27	-205.72	-103.98	
7,276.00	11.85	225.14	7,239.94	236.39 S	288.28 W	504,278.01	726,233.02	0.27	-205.98	-103.96	
7,278.00	11.85	225.11	7,241.90	236.67 S	288.57 W	504,277.73	726,232.73	0.27	-206.24	-103.93	
7,280.00	11.84	225.09	7,243.86	236.96 S	288.86 W	504,277.44	726,232.44	0.27	-206.50	-103.91	
7,282.00	11.84	225.06	7,245.81	237.25 S	289.15 W	504,277.15	726,232.15	0.27	-206.75	-103.88	
7,284.00	11.84	225.04	7,247.77	237.54 S	289.44 W	504,276.86	726,231.86	0.27	-207.01	-103.86	
7,286.00	11.84	225.01	7,249.73	237.83 S	289.73 W	504,276.57	726,231.57	0.27	-207.27	-103.84	
7,288.00	11.84	224.99	7,251.69	238.12 S	290.02 W	504,276.28	726,231.28	0.27	-207.53	-103.81	
7,290.00	11.84	224.96	7,253.64	238.41 S	290.31 W	504,275.99	726,230.99	0.27	-207.79	-103.79	
7,292.00	11.84	224.94	7,255.60	238.71 S	290.60 W	504,275.69	726,230.70	0.27	-208.05	-103.76	
7,294.00	11.84	224.91	7,257.56	239.00 S	290.89 W	504,275.40	726,230.41	0.27	-208.31	-103.74	
7,296.00	11.83	224.89	7,259.52	239.29 S	291.18 W	504,275.11	726,230.12	0.27	-208.57	-103.71	
7,298.00	11.83	224.86	7,261.47	239.58 S	291.47 W	504,274.82	726,229.83	0.27	-208.83	-103.69	
7,300.00	11.83	224.84	7,263.43	239.87 S	291.76 W	504,274.53	726,229.54	0.27	-209.09	-103.66	
7,302.00	11.83	224.81	7,265.39	240.16 S	292.05 W	504,274.24	726,229.25	0.27	-209.35	-103.64	
7,304.00	11.83	224.85	7,267.35	240.45 S	292.34 W	504,273.95	726,228.96	0.48	-209.61	62.09	
7,306.00	11.84	224.89	7,269.30	240.74 S	292.63 W	504,273.66	726,228.67	0.48	-209.87	62.05	
7,308.00	11.84	224.94	7,271.26	241.03 S	292.92 W	504,273.37	726,228.38	0.48	-210.13	62.01	
7,310.00	11.85	224.98	7,273.22	241.32 S	293.21 W	504,273.08	726,228.09	0.48	-210.39	61.97	
7,312.00	11.85	225.02	7,275.18	241.61 S	293.50 W	504,272.79	726,227.80	0.48	-210.65	61.93	
7,314.00	11.86	225.06	7,277.13	241.90 S	293.79 W	504,272.50	726,227.51	0.48	-210.91	61.89	
7,316.00	11.86	225.10	7,279.09	242.19 S	294.08 W	504,272.21	726,227.22	0.48	-211.17	61.85	
7,318.00	11.87	225.14	7,281.05	242.48 S	294.37 W	504,271.92	726,226.93	0.48	-211.43	61.81	
7,320.00	11.87	225.18	7,283.01	242.77 S	294.66 W	504,271.63	726,226.64	0.48	-211.69	61.77	
7,322.00	11.88	225.23	7,284.96	243.06 S	294.96 W	504,271.34	726,226.34	0.48	-211.94	61.73	
7,324.00	11.88	225.27	7,286.92	243.35 S	295.25 W	504,271.05	726,226.05	0.48	-212.20	61.69	

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				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
7,326.00	11.88	225.31	7,288.88	243.64 S	295.54 W	504,270.76	726,225.76	0.48	-212.46	61.64	
7,328.00	11.89	225.35	7,290.83	243.93 S	295.83 W	504,270.47	726,225.47	0.48	-212.72	61.60	
7,330.00	11.89	225.39	7,292.79	244.22 S	296.13 W	504,270.18	726,225.17	0.48	-212.98	61.56	
7,332.00	11.90	225.43	7,294.75	244.51 S	296.42 W	504,269.89	726,224.88	0.48	-213.24	61.52	
7,334.00	11.90	225.47	7,296.71	244.80 S	296.72 W	504,269.60	726,224.58	0.48	-213.49	61.48	
7,336.00	11.91	225.52	7,298.66	245.09 S	297.01 W	504,269.31	726,224.29	0.48	-213.75	61.44	
7,338.00	11.91	225.56	7,300.62	245.38 S	297.30 W	504,269.02	726,224.00	0.48	-214.01	61.40	
7,340.00	11.92	225.60	7,302.58	245.67 S	297.60 W	504,268.73	726,223.70	0.48	-214.27	61.36	
7,342.00	11.92	225.64	7,304.53	245.96 S	297.89 W	504,268.44	726,223.41	0.48	-214.53	61.32	
7,344.00	11.93	225.68	7,306.49	246.24 S	298.19 W	504,268.16	726,223.11	0.48	-214.78	61.28	
7,346.00	11.93	225.72	7,308.45	246.53 S	298.49 W	504,267.87	726,222.81	0.48	-215.04	61.24	
7,348.00	11.94	225.76	7,310.40	246.82 S	298.78 W	504,267.58	726,222.52	0.48	-215.30	61.20	
7,350.00	11.94	225.80	7,312.36	247.11 S	299.08 W	504,267.29	726,222.22	0.48	-215.55	61.16	
7,352.00	11.95	225.85	7,314.32	247.40 S	299.38 W	504,267.00	726,221.92	0.48	-215.81	61.12	
7,354.00	11.95	225.89	7,316.27	247.69 S	299.67 W	504,266.71	726,221.63	0.48	-216.07	61.08	
7,356.00	11.95	225.93	7,318.23	247.98 S	299.97 W	504,266.42	726,221.33	0.48	-216.32	61.04	
7,358.00	11.96	225.97	7,320.19	248.26 S	300.27 W	504,266.14	726,221.03	0.48	-216.58	61.00	
7,360.00	11.96	226.01	7,322.14	248.55 S	300.57 W	504,265.85	726,220.73	0.48	-216.84	60.96	
7,362.00	11.97	226.05	7,324.10	248.84 S	300.86 W	504,265.56	726,220.44	0.48	-217.09	60.92	
7,364.00	11.97	226.09	7,326.06	249.13 S	301.16 W	504,265.27	726,220.14	0.48	-217.35	60.88	
7,366.00	11.98	226.13	7,328.01	249.42 S	301.46 W	504,264.98	726,219.84	0.48	-217.61	60.84	
7,368.00	11.98	226.17	7,329.97	249.70 S	301.76 W	504,264.70	726,219.54	0.48	-217.86	60.80	
7,370.00	11.99	226.21	7,331.93	249.99 S	302.06 W	504,264.41	726,219.24	0.48	-218.12	60.76	
7,372.00	11.99	226.25	7,333.88	250.28 S	302.36 W	504,264.12	726,218.94	0.48	-218.37	60.72	
7,374.00	12.00	226.29	7,335.84	250.57 S	302.66 W	504,263.83	726,218.64	0.48	-218.63	60.68	
7,376.00	12.00	226.34	7,337.80	250.85 S	302.96 W	504,263.55	726,218.34	0.48	-218.88	60.64	
7,378.00	12.01	226.38	7,339.75	251.14 S	303.26 W	504,263.26	726,218.04	0.48	-219.14	60.60	
7,380.00	12.01	226.42	7,341.71	251.43 S	303.57 W	504,262.97	726,217.73	0.48	-219.39	60.56	
7,382.00	12.02	226.46	7,343.66	251.71 S	303.87 W	504,262.69	726,217.43	0.48	-219.65	60.52	
7,384.00	12.02	226.50	7,345.62	252.00 S	304.17 W	504,262.40	726,217.13	0.48	-219.90	60.48	
7,386.00	12.03	226.54	7,347.58	252.29 S	304.47 W	504,262.11	726,216.83	0.48	-220.16	60.44	
7,388.00	12.03	226.58	7,349.53	252.57 S	304.77 W	504,261.83	726,216.53	0.48	-220.41	60.40	
7,390.00	12.04	226.62	7,351.49	252.86 S	305.08 W	504,261.54	726,216.22	0.48	-220.67	60.36	
7,392.00	12.04	226.66	7,353.44	253.15 S	305.38 W	504,261.25	726,215.92	0.48	-220.92	60.32	
7,394.00	12.05	226.70	7,355.40	253.43 S	305.68 W	504,260.97	726,215.62	0.48	-221.17	60.28	
7,396.00	12.05	226.74	7,357.36	253.72 S	305.99 W	504,260.68	726,215.31	0.48	-221.43	60.24	
7,398.00	12.05	226.74	7,359.31	254.00 S	306.29 W	504,260.40	726,215.01	0.00	-221.68	0.00	

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				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
7,400.00	12.05	226.75	7,361.27	254.29 S	306.60 W	504,260.11	726,214.70	0.27	-221.94	31.54	
7,402.00	12.06	226.76	7,363.22	254.58 S	306.90 W	504,259.82	726,214.40	0.14	-222.19	31.53	
7,404.00	12.06	226.77	7,365.18	254.86 S	307.20 W	504,259.54	726,214.10	0.14	-222.44	31.52	
7,406.00	12.06	226.77	7,367.14	255.15 S	307.51 W	504,259.25	726,213.79	0.14	-222.70	31.52	
7,408.00	12.06	226.78	7,369.09	255.44 S	307.81 W	504,258.96	726,213.49	0.14	-222.95	31.51	
7,410.00	12.07	226.79	7,371.05	255.72 S	308.12 W	504,258.68	726,213.18	0.14	-223.21	31.50	
7,412.00	12.07	226.79	7,373.00	256.01 S	308.42 W	504,258.39	726,212.88	0.14	-223.46	31.50	
7,414.00	12.07	226.80	7,374.96	256.29 S	308.73 W	504,258.11	726,212.57	0.14	-223.71	31.49	
7,416.00	12.07	226.81	7,376.91	256.58 S	309.03 W	504,257.82	726,212.27	0.14	-223.97	31.48	
7,418.00	12.08	226.81	7,378.87	256.87 S	309.34 W	504,257.53	726,211.96	0.14	-224.22	31.48	
7,420.00	12.08	226.82	7,380.83	257.15 S	309.64 W	504,257.25	726,211.66	0.14	-224.48	31.47	
7,422.00	12.08	226.83	7,382.78	257.44 S	309.95 W	504,256.96	726,211.35	0.14	-224.73	31.46	
7,424.00	12.08	226.83	7,384.74	257.73 S	310.25 W	504,256.67	726,211.05	0.14	-224.98	31.46	
7,426.00	12.08	226.84	7,386.69	258.01 S	310.56 W	504,256.39	726,210.74	0.14	-225.24	31.45	
7,428.00	12.09	226.85	7,388.65	258.30 S	310.86 W	504,256.10	726,210.44	0.14	-225.49	31.44	
7,430.00	12.09	226.86	7,390.60	258.59 S	311.17 W	504,255.81	726,210.13	0.14	-225.75	31.44	
7,432.00	12.09	226.86	7,392.56	258.87 S	311.48 W	504,255.53	726,209.82	0.14	-226.00	31.43	
7,434.00	12.09	226.87	7,394.52	259.16 S	311.78 W	504,255.24	726,209.52	0.14	-226.25	31.42	
7,436.00	12.10	226.88	7,396.47	259.45 S	312.09 W	504,254.95	726,209.21	0.14	-226.51	31.42	
7,438.00	12.10	226.88	7,398.43	259.73 S	312.39 W	504,254.67	726,208.91	0.14	-226.76	31.41	
7,440.00	12.10	226.89	7,400.38	260.02 S	312.70 W	504,254.38	726,208.60	0.14	-227.02	31.40	
7,442.00	12.10	226.90	7,402.34	260.30 S	313.01 W	504,254.10	726,208.29	0.14	-227.27	31.40	
7,444.00	12.11	226.90	7,404.29	260.59 S	313.31 W	504,253.81	726,207.99	0.14	-227.52	31.39	
7,446.00	12.11	226.91	7,406.25	260.88 S	313.62 W	504,253.52	726,207.68	0.14	-227.78	31.38	
7,448.00	12.11	226.92	7,408.20	261.16 S	313.92 W	504,253.24	726,207.38	0.14	-228.03	31.38	
7,450.00	12.11	226.92	7,410.16	261.45 S	314.23 W	504,252.95	726,207.07	0.14	-228.29	31.37	
7,452.00	12.11	226.93	7,412.12	261.74 S	314.54 W	504,252.66	726,206.76	0.14	-228.54	31.36	
7,454.00	12.12	226.94	7,414.07	262.02 S	314.84 W	504,252.38	726,206.46	0.14	-228.79	31.36	
7,456.00	12.12	226.94	7,416.03	262.31 S	315.15 W	504,252.09	726,206.15	0.14	-229.05	31.35	
7,458.00	12.12	226.95	7,417.98	262.60 S	315.46 W	504,251.80	726,205.84	0.14	-229.30	31.34	
7,460.00	12.12	226.96	7,419.94	262.88 S	315.76 W	504,251.52	726,205.54	0.14	-229.56	31.34	
7,462.00	12.13	226.96	7,421.89	263.17 S	316.07 W	504,251.23	726,205.23	0.14	-229.81	31.33	
7,464.00	12.13	226.97	7,423.85	263.46 S	316.38 W	504,250.94	726,204.92	0.14	-230.07	31.32	
7,466.00	12.13	226.98	7,425.80	263.74 S	316.69 W	504,250.66	726,204.61	0.14	-230.32	31.32	
7,468.00	12.13	226.98	7,427.76	264.03 S	316.99 W	504,250.37	726,204.31	0.14	-230.57	31.31	
7,470.00	12.14	226.99	7,429.71	264.32 S	317.30 W	504,250.08	726,204.00	0.14	-230.83	31.30	
7,472.00	12.14	227.00	7,431.67	264.60 S	317.61 W	504,249.80	726,203.69	0.14	-231.08	31.30	

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Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
7,474.00	12.14	227.00	7,433.62	264.89 S	317.92 W	504,249.51	726,203.38	0.14	-231.34	31.29	
7,476.00	12.14	227.01	7,435.58	265.18 S	318.22 W	504,249.22	726,203.08	0.14	-231.59	31.28	
7,478.00	12.14	227.02	7,437.54	265.47 S	318.53 W	504,248.93	726,202.77	0.14	-231.85	31.28	
7,480.00	12.15	227.02	7,439.49	265.75 S	318.84 W	504,248.65	726,202.46	0.14	-232.10	31.27	
7,482.00	12.15	227.03	7,441.45	266.04 S	319.15 W	504,248.36	726,202.15	0.14	-232.35	31.26	
7,484.00	12.15	227.04	7,443.40	266.33 S	319.45 W	504,248.07	726,201.85	0.14	-232.61	31.26	
7,486.00	12.15	227.04	7,445.36	266.61 S	319.76 W	504,247.79	726,201.54	0.14	-232.86	31.25	
7,488.00	12.16	227.05	7,447.31	266.90 S	320.07 W	504,247.50	726,201.23	0.14	-233.12	31.25	
7,490.00	12.16	227.06	7,449.27	267.19 S	320.38 W	504,247.21	726,200.92	0.14	-233.37	31.24	
7,492.00	12.16	227.06	7,451.22	267.47 S	320.69 W	504,246.93	726,200.61	0.07	-233.62	31.23	
7,494.00	12.16	227.06	7,453.18	267.76 S	321.00 W	504,246.64	726,200.30	0.00	-233.88	0.00	
7,496.00	12.15	227.06	7,455.13	268.05 S	321.30 W	504,246.35	726,200.00	0.27	-234.13	171.75	
7,498.00	12.15	227.07	7,457.09	268.33 S	321.61 W	504,246.07	726,199.69	0.11	-234.39	171.74	
7,500.00	12.15	227.07	7,459.04	268.62 S	321.92 W	504,245.78	726,199.38	0.11	-234.64	171.74	
7,502.00	12.15	227.07	7,461.00	268.91 S	322.23 W	504,245.49	726,199.07	0.11	-234.90	171.74	
7,504.00	12.15	227.07	7,462.95	269.19 S	322.54 W	504,245.21	726,198.76	0.11	-235.15	171.74	
7,506.00	12.14	227.07	7,464.91	269.48 S	322.85 W	504,244.92	726,198.45	0.11	-235.40	171.74	
7,508.00	12.14	227.07	7,466.86	269.77 S	323.15 W	504,244.63	726,198.15	0.11	-235.66	171.74	
7,510.00	12.14	227.07	7,468.82	270.05 S	323.46 W	504,244.35	726,197.84	0.11	-235.91	171.74	
7,512.00	12.14	227.08	7,470.77	270.34 S	323.77 W	504,244.06	726,197.53	0.11	-236.16	171.73	
7,514.00	12.14	227.08	7,472.73	270.63 S	324.08 W	504,243.77	726,197.22	0.11	-236.42	171.73	
7,516.00	12.13	227.08	7,474.68	270.91 S	324.39 W	504,243.49	726,196.91	0.11	-236.67	171.73	
7,518.00	12.13	227.08	7,476.64	271.20 S	324.69 W	504,243.20	726,196.61	0.11	-236.93	171.73	
7,520.00	12.13	227.08	7,478.59	271.49 S	325.00 W	504,242.91	726,196.30	0.11	-237.18	171.73	
7,522.00	12.13	227.08	7,480.55	271.77 S	325.31 W	504,242.63	726,195.99	0.11	-237.43	171.73	
7,524.00	12.13	227.08	7,482.51	272.06 S	325.62 W	504,242.34	726,195.68	0.11	-237.69	171.73	
7,526.00	12.12	227.09	7,484.46	272.34 S	325.92 W	504,242.06	726,195.38	0.11	-237.94	171.72	
7,528.00	12.12	227.09	7,486.42	272.63 S	326.23 W	504,241.77	726,195.07	0.11	-238.19	171.72	
7,530.00	12.12	227.09	7,488.37	272.92 S	326.54 W	504,241.48	726,194.76	0.11	-238.45	171.72	
7,532.00	12.12	227.09	7,490.33	273.20 S	326.85 W	504,241.20	726,194.45	0.11	-238.70	171.72	
7,534.00	12.11	227.09	7,492.28	273.49 S	327.15 W	504,240.91	726,194.15	0.11	-238.95	171.72	
7,536.00	12.11	227.09	7,494.24	273.77 S	327.46 W	504,240.63	726,193.84	0.11	-239.21	171.72	
7,538.00	12.11	227.09	7,496.19	274.06 S	327.77 W	504,240.34	726,193.53	0.11	-239.46	171.72	
7,540.00	12.11	227.10	7,498.15	274.34 S	328.08 W	504,240.06	726,193.22	0.11	-239.71	171.71	
7,542.00	12.11	227.10	7,500.10	274.63 S	328.38 W	504,239.77	726,192.92	0.11	-239.97	171.71	
7,544.00	12.10	227.10	7,502.06	274.92 S	328.69 W	504,239.48	726,192.61	0.11	-240.22	171.71	

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Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
7,546.00	12.10	227.10	7,504.02	275.20 S	329.00 W	504,239.20	726,192.30	0.11	-240.47	171.71	
7,548.00	12.10	227.10	7,505.97	275.49 S	329.30 W	504,238.91	726,192.00	0.11	-240.72	171.71	
7,550.00	12.10	227.10	7,507.93	275.77 S	329.61 W	504,238.63	726,191.69	0.11	-240.98	171.71	
7,552.00	12.10	227.10	7,509.88	276.06 S	329.92 W	504,238.34	726,191.38	0.11	-241.23	171.71	
7,554.00	12.09	227.11	7,511.84	276.34 S	330.23 W	504,238.06	726,191.07	0.11	-241.48	171.70	
7,556.00	12.09	227.11	7,513.79	276.63 S	330.53 W	504,237.77	726,190.77	0.11	-241.73	171.70	
7,558.00	12.09	227.11	7,515.75	276.91 S	330.84 W	504,237.49	726,190.46	0.11	-241.99	171.70	
7,560.00	12.09	227.11	7,517.70	277.20 S	331.15 W	504,237.20	726,190.15	0.11	-242.24	171.70	
7,562.00	12.08	227.11	7,519.66	277.48 S	331.45 W	504,236.92	726,189.85	0.11	-242.49	171.70	
7,564.00	12.08	227.11	7,521.62	277.77 S	331.76 W	504,236.63	726,189.54	0.11	-242.74	171.70	
7,566.00	12.08	227.12	7,523.57	278.05 S	332.07 W	504,236.35	726,189.23	0.11	-243.00	171.70	
7,568.00	12.08	227.12	7,525.53	278.34 S	332.37 W	504,236.06	726,188.93	0.11	-243.25	171.69	
7,570.00	12.08	227.12	7,527.48	278.62 S	332.68 W	504,235.78	726,188.62	0.11	-243.50	171.69	
7,572.00	12.07	227.12	7,529.44	278.91 S	332.99 W	504,235.49	726,188.31	0.11	-243.75	171.69	
7,574.00	12.07	227.12	7,531.39	279.19 S	333.29 W	504,235.21	726,188.01	0.11	-244.01	171.69	
7,576.00	12.07	227.12	7,533.35	279.48 S	333.60 W	504,234.92	726,187.70	0.11	-244.26	171.69	
7,578.00	12.07	227.12	7,535.31	279.76 S	333.91 W	504,234.64	726,187.39	0.11	-244.51	171.69	
7,580.00	12.07	227.13	7,537.26	280.05 S	334.21 W	504,234.35	726,187.09	0.11	-244.76	171.69	
7,582.00	12.06	227.13	7,539.22	280.33 S	334.52 W	504,234.07	726,186.78	0.11	-245.01	171.68	
7,584.00	12.06	227.13	7,541.17	280.61 S	334.83 W	504,233.79	726,186.47	0.11	-245.27	171.68	
7,586.00	12.06	227.13	7,543.13	280.90 S	335.13 W	504,233.50	726,186.17	0.11	-245.52	171.68	
7,588.00	12.06	227.13	7,545.09	281.18 S	335.44 W	504,233.22	726,185.86	0.11	-245.77	171.68	
7,590.00	12.06	227.13	7,547.04	281.47 S	335.74 W	504,232.93	726,185.56	0.11	-246.02	171.68	
7,592.00	12.05	227.13	7,549.00	281.75 S	336.05 W	504,232.65	726,185.25	0.11	-246.27	171.68	
7,594.00	12.05	227.14	7,550.95	282.03 S	336.36 W	504,232.37	726,184.94	0.11	-246.52	171.68	
7,596.00	12.05	227.14	7,552.91	282.32 S	336.66 W	504,232.08	726,184.64	0.11	-246.78	171.67	
7,598.00	12.05	227.14	7,554.87	282.60 S	336.97 W	504,231.80	726,184.33	0.11	-247.03	171.67	
7,600.00	12.04	227.14	7,556.82	282.89 S	337.27 W	504,231.51	726,184.03	0.11	-247.28	171.67	
7,602.00	12.04	227.14	7,558.78	283.17 S	337.58 W	504,231.23	726,183.72	0.11	-247.53	171.67	
7,604.00	12.04	227.14	7,560.73	283.45 S	337.89 W	504,230.95	726,183.41	0.11	-247.78	171.67	
7,606.00	12.04	227.14	7,562.69	283.74 S	338.19 W	504,230.66	726,183.11	0.11	-248.03	171.67	
7,608.00	12.04	227.15	7,564.65	284.02 S	338.50 W	504,230.38	726,182.80	0.11	-248.28	171.66	
7,610.00	12.03	227.15	7,566.60	284.31 S	338.80 W	504,230.09	726,182.50	0.11	-248.54	171.66	
7,612.00	12.03	227.15	7,568.56	284.59 S	339.11 W	504,229.81	726,182.19	0.11	-248.79	171.66	
7,614.00	12.03	227.15	7,570.51	284.87 S	339.41 W	504,229.53	726,181.89	0.11	-249.04	171.66	
7,616.00	12.03	227.15	7,572.47	285.16 S	339.72 W	504,229.24	726,181.58	0.11	-249.29	171.66	
7,618.00	12.03	227.15	7,574.43	285.44 S	340.03 W	504,228.96	726,181.27	0.11	-249.54	171.66	

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				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
7,620.00	12.02	227.16	7,576.38	285.72 S	340.33 W	504,228.68	726,180.97	0.11	-249.79	171.66	
7,622.00	12.02	227.16	7,578.34	286.01 S	340.64 W	504,228.39	726,180.66	0.11	-250.04	171.65	
7,624.00	12.02	227.16	7,580.29	286.29 S	340.94 W	504,228.11	726,180.36	0.11	-250.29	171.65	
7,626.00	12.02	227.16	7,582.25	286.57 S	341.25 W	504,227.83	726,180.05	0.11	-250.54	171.65	
7,628.00	12.02	227.16	7,584.21	286.86 S	341.55 W	504,227.54	726,179.75	0.11	-250.79	171.65	
7,630.00	12.01	227.16	7,586.16	287.14 S	341.86 W	504,227.26	726,179.44	0.11	-251.04	171.65	
7,632.00	12.01	227.16	7,588.12	287.42 S	342.16 W	504,226.98	726,179.14	0.11	-251.30	171.65	
7,634.00	12.01	227.17	7,590.07	287.70 S	342.47 W	504,226.70	726,178.83	0.11	-251.55	171.65	
7,636.00	12.01	227.17	7,592.03	287.99 S	342.77 W	504,226.41	726,178.53	0.11	-251.80	171.64	
7,638.00	12.00	227.17	7,593.99	288.27 S	343.08 W	504,226.13	726,178.22	0.11	-252.05	171.64	
7,640.00	12.00	227.17	7,595.94	288.55 S	343.38 W	504,225.85	726,177.92	0.11	-252.30	171.64	
7,642.00	12.00	227.17	7,597.90	288.84 S	343.69 W	504,225.56	726,177.61	0.11	-252.55	171.64	
7,644.00	12.00	227.17	7,599.86	289.12 S	343.99 W	504,225.28	726,177.31	0.11	-252.80	171.64	
7,646.00	12.00	227.17	7,601.81	289.40 S	344.30 W	504,225.00	726,177.00	0.11	-253.05	171.64	
7,648.00	11.99	227.18	7,603.77	289.68 S	344.60 W	504,224.72	726,176.70	0.11	-253.30	171.64	
7,650.00	11.99	227.18	7,605.73	289.97 S	344.91 W	504,224.43	726,176.39	0.11	-253.55	171.63	
7,652.00	11.99	227.18	7,607.68	290.25 S	345.21 W	504,224.15	726,176.09	0.11	-253.80	171.63	
7,654.00	11.99	227.18	7,609.64	290.53 S	345.52 W	504,223.87	726,175.78	0.11	-254.05	171.63	
7,656.00	11.99	227.18	7,611.59	290.81 S	345.82 W	504,223.59	726,175.48	0.11	-254.30	171.63	
7,658.00	11.98	227.18	7,613.55	291.10 S	346.13 W	504,223.30	726,175.17	0.11	-254.55	171.63	
7,660.00	11.98	227.18	7,615.51	291.38 S	346.43 W	504,223.02	726,174.87	0.11	-254.80	171.63	
7,662.00	11.98	227.19	7,617.46	291.66 S	346.74 W	504,222.74	726,174.56	0.11	-255.05	171.63	
7,664.00	11.98	227.19	7,619.42	291.94 S	347.04 W	504,222.46	726,174.26	0.11	-255.30	171.62	
7,666.00	11.97	227.19	7,621.38	292.22 S	347.34 W	504,222.18	726,173.96	0.11	-255.55	171.62	
7,668.00	11.97	227.19	7,623.33	292.51 S	347.65 W	504,221.89	726,173.65	0.11	-255.80	171.62	
7,670.00	11.97	227.19	7,625.29	292.79 S	347.95 W	504,221.61	726,173.35	0.11	-256.05	171.62	
7,672.00	11.97	227.19	7,627.25	293.07 S	348.26 W	504,221.33	726,173.04	0.11	-256.30	171.62	
7,674.00	11.97	227.20	7,629.20	293.35 S	348.56 W	504,221.05	726,172.74	0.11	-256.55	171.62	
7,676.00	11.96	227.20	7,631.16	293.63 S	348.87 W	504,220.77	726,172.43	0.11	-256.80	171.62	
7,678.00	11.96	227.20	7,633.12	293.91 S	349.17 W	504,220.49	726,172.13	0.11	-257.05	171.61	
7,680.00	11.96	227.20	7,635.07	294.20 S	349.47 W	504,220.20	726,171.83	0.11	-257.29	171.61	
7,682.00	11.96	227.16	7,637.03	294.48 S	349.78 W	504,219.92	726,171.52	0.45	-257.54	-110.25	
7,684.00	11.95	227.12	7,638.99	294.76 S	350.08 W	504,219.64	726,171.22	0.45	-257.79	-110.21	
7,686.00	11.95	227.08	7,640.94	295.04 S	350.39 W	504,219.36	726,170.91	0.45	-258.04	-110.17	
7,688.00	11.95	227.04	7,642.90	295.32 S	350.69 W	504,219.08	726,170.61	0.45	-258.29	-110.13	
7,690.00	11.94	227.00	7,644.86	295.61 S	350.99 W	504,218.79	726,170.31	0.45	-258.54	-110.09	
7,692.00	11.94	226.96	7,646.81	295.89 S	351.29 W	504,218.51	726,170.01	0.45	-258.79	-110.05	

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				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
7,694.00	11.94	226.92	7,648.77	296.17 S	351.60 W	504,218.23	726,169.70	0.45	-259.04	-110.01	
7,696.00	11.94	226.88	7,650.73	296.45 S	351.90 W	504,217.95	726,169.40	0.45	-259.30	-109.97	
7,698.00	11.93	226.84	7,652.68	296.74 S	352.20 W	504,217.66	726,169.10	0.45	-259.55	-109.93	
7,700.00	11.93	226.80	7,654.64	297.02 S	352.50 W	504,217.38	726,168.80	0.45	-259.80	-109.89	
7,702.00	11.93	226.75	7,656.60	297.30 S	352.80 W	504,217.10	726,168.50	0.45	-260.05	-109.85	
7,704.00	11.92	226.71	7,658.55	297.59 S	353.10 W	504,216.81	726,168.20	0.45	-260.30	-109.82	
7,706.00	11.92	226.67	7,660.51	297.87 S	353.40 W	504,216.53	726,167.90	0.45	-260.55	-109.78	
7,708.00	11.92	226.63	7,662.47	298.15 S	353.71 W	504,216.25	726,167.59	0.45	-260.80	-109.74	
7,710.00	11.91	226.59	7,664.42	298.44 S	354.01 W	504,215.96	726,167.29	0.45	-261.05	-109.70	
7,712.00	11.91	226.55	7,666.38	298.72 S	354.31 W	504,215.68	726,166.99	0.45	-261.31	-109.66	
7,714.00	11.91	226.51	7,668.34	299.00 S	354.60 W	504,215.40	726,166.70	0.45	-261.56	-109.62	
7,716.00	11.91	226.47	7,670.29	299.29 S	354.90 W	504,215.11	726,166.40	0.45	-261.81	-109.58	
7,718.00	11.90	226.43	7,672.25	299.57 S	355.20 W	504,214.83	726,166.10	0.45	-262.06	-109.54	
7,720.00	11.90	226.39	7,674.21	299.86 S	355.50 W	504,214.54	726,165.80	0.45	-262.32	-109.50	
7,722.00	11.90	226.35	7,676.17	300.14 S	355.80 W	504,214.26	726,165.50	0.45	-262.57	-109.46	
7,724.00	11.89	226.31	7,678.12	300.43 S	356.10 W	504,213.97	726,165.20	0.45	-262.82	-109.42	
7,726.00	11.89	226.27	7,680.08	300.71 S	356.40 W	504,213.69	726,164.90	0.45	-263.08	-109.38	
7,728.00	11.89	226.23	7,682.04	301.00 S	356.69 W	504,213.40	726,164.61	0.45	-263.33	-109.34	
7,730.00	11.88	226.18	7,683.99	301.28 S	356.99 W	504,213.12	726,164.31	0.45	-263.58	-109.30	
7,732.00	11.88	226.14	7,685.95	301.57 S	357.29 W	504,212.83	726,164.01	0.45	-263.84	-109.26	
7,734.00	11.88	226.10	7,687.91	301.85 S	357.58 W	504,212.55	726,163.72	0.45	-264.09	-109.22	
7,736.00	11.88	226.06	7,689.87	302.14 S	357.88 W	504,212.26	726,163.42	0.45	-264.34	-109.18	
7,738.00	11.87	226.02	7,691.82	302.42 S	358.18 W	504,211.98	726,163.12	0.45	-264.60	-109.14	
7,740.00	11.87	225.98	7,693.78	302.71 S	358.47 W	504,211.69	726,162.83	0.45	-264.85	-109.10	
7,742.00	11.87	225.94	7,695.74	302.99 S	358.77 W	504,211.41	726,162.53	0.45	-265.11	-109.06	
7,744.00	11.86	225.90	7,697.69	303.28 S	359.06 W	504,211.12	726,162.24	0.45	-265.36	-109.02	
7,746.00	11.86	225.86	7,699.65	303.57 S	359.36 W	504,210.83	726,161.94	0.45	-265.62	-108.98	
7,748.00	11.86	225.82	7,701.61	303.85 S	359.65 W	504,210.55	726,161.65	0.45	-265.87	-108.94	
7,750.00	11.86	225.77	7,703.57	304.14 S	359.95 W	504,210.26	726,161.35	0.45	-266.13	-108.90	
7,752.00	11.85	225.73	7,705.52	304.43 S	360.24 W	504,209.97	726,161.06	0.45	-266.38	-108.86	
7,754.00	11.85	225.69	7,707.48	304.71 S	360.54 W	504,209.69	726,160.76	0.45	-266.64	-108.82	
7,756.00	11.85	225.65	7,709.44	305.00 S	360.83 W	504,209.40	726,160.47	0.45	-266.89	-108.78	
7,758.00	11.84	225.61	7,711.40	305.29 S	361.12 W	504,209.11	726,160.18	0.45	-267.15	-108.74	
7,760.00	11.84	225.57	7,713.35	305.57 S	361.42 W	504,208.83	726,159.88	0.45	-267.41	-108.70	
7,762.00	11.84	225.53	7,715.31	305.86 S	361.71 W	504,208.54	726,159.59	0.45	-267.66	-108.66	
7,764.00	11.84	225.49	7,717.27	306.15 S	362.00 W	504,208.25	726,159.30	0.45	-267.92	-108.61	

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Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
7,766.00	11.83	225.45	7,719.23	306.44 S	362.30 W	504,207.96	726,159.00	0.45	-268.17	-108.57	
7,768.00	11.83	225.40	7,721.18	306.72 S	362.59 W	504,207.68	726,158.71	0.45	-268.43	-108.53	
7,770.00	11.83	225.36	7,723.14	307.01 S	362.88 W	504,207.39	726,158.42	0.45	-268.69	-108.49	
7,772.00	11.82	225.32	7,725.10	307.30 S	363.17 W	504,207.10	726,158.13	0.45	-268.94	-108.45	
7,774.00	11.82	225.28	7,727.06	307.59 S	363.46 W	504,206.81	726,157.84	0.45	-269.20	-108.41	
7,776.00	11.82	225.24	7,729.01	307.88 S	363.75 W	504,206.52	726,157.55	0.51	-269.46	-120.72	
7,778.00	11.81	225.19	7,730.97	308.17 S	364.04 W	504,206.23	726,157.26	0.58	-269.72	-130.07	
7,780.00	11.80	225.15	7,732.93	308.45 S	364.33 W	504,205.95	726,156.97	0.58	-269.97	-130.02	
7,782.00	11.79	225.11	7,734.89	308.74 S	364.62 W	504,205.66	726,156.68	0.58	-270.23	-129.98	
7,784.00	11.79	225.06	7,736.84	309.03 S	364.91 W	504,205.37	726,156.39	0.58	-270.49	-129.94	
7,786.00	11.78	225.02	7,738.80	309.32 S	365.20 W	504,205.08	726,156.10	0.58	-270.75	-129.90	
7,788.00	11.77	224.97	7,740.76	309.61 S	365.49 W	504,204.79	726,155.81	0.58	-271.01	-129.85	
7,790.00	11.76	224.93	7,742.72	309.90 S	365.78 W	504,204.50	726,155.52	0.58	-271.26	-129.81	
7,792.00	11.76	224.89	7,744.68	310.19 S	366.07 W	504,204.21	726,155.23	0.58	-271.52	-129.77	
7,794.00	11.75	224.84	7,746.63	310.47 S	366.35 W	504,203.93	726,154.95	0.58	-271.78	-129.72	
7,796.00	11.74	224.80	7,748.59	310.76 S	366.64 W	504,203.64	726,154.66	0.58	-272.04	-129.68	
7,798.00	11.73	224.75	7,750.55	311.05 S	366.93 W	504,203.35	726,154.37	0.58	-272.30	-129.64	
7,800.00	11.73	224.71	7,752.51	311.34 S	367.21 W	504,203.06	726,154.09	0.58	-272.55	-129.59	
7,802.00	11.72	224.67	7,754.47	311.63 S	367.50 W	504,202.77	726,153.80	0.58	-272.81	-129.55	
7,804.00	11.71	224.62	7,756.43	311.92 S	367.79 W	504,202.48	726,153.51	0.58	-273.07	-129.51	
7,806.00	11.70	224.58	7,758.38	312.21 S	368.07 W	504,202.19	726,153.23	0.58	-273.33	-129.46	
7,808.00	11.70	224.53	7,760.34	312.50 S	368.35 W	504,201.90	726,152.95	0.58	-273.59	-129.42	
7,810.00	11.69	224.49	7,762.30	312.79 S	368.64 W	504,201.61	726,152.66	0.58	-273.85	-129.38	
7,812.00	11.68	224.44	7,764.26	313.08 S	368.92 W	504,201.32	726,152.38	0.58	-274.11	-129.33	
7,814.00	11.67	224.40	7,766.22	313.36 S	369.21 W	504,201.04	726,152.09	0.58	-274.37	-129.29	
7,816.00	11.67	224.35	7,768.18	313.65 S	369.49 W	504,200.75	726,151.81	0.58	-274.62	-129.24	
7,818.00	11.66	224.31	7,770.14	313.94 S	369.77 W	504,200.46	726,151.53	0.58	-274.88	-129.20	
7,820.00	11.65	224.26	7,772.09	314.23 S	370.05 W	504,200.17	726,151.25	0.58	-275.14	-129.16	
7,822.00	11.64	224.22	7,774.05	314.52 S	370.34 W	504,199.88	726,150.96	0.58	-275.40	-129.11	
7,824.00	11.64	224.17	7,776.01	314.81 S	370.62 W	504,199.59	726,150.68	0.58	-275.66	-129.07	
7,826.00	11.63	224.13	7,777.97	315.10 S	370.90 W	504,199.30	726,150.40	0.58	-275.92	-129.02	
7,828.00	11.62	224.08	7,779.93	315.39 S	371.18 W	504,199.01	726,150.12	0.58	-276.18	-128.98	
7,830.00	11.62	224.04	7,781.89	315.68 S	371.46 W	504,198.72	726,149.84	0.58	-276.44	-128.94	
7,832.00	11.61	223.99	7,783.85	315.97 S	371.74 W	504,198.43	726,149.56	0.58	-276.70	-128.89	
7,834.00	11.60	223.95	7,785.81	316.26 S	372.02 W	504,198.14	726,149.28	0.58	-276.96	-128.85	
7,836.00	11.59	223.90	7,787.77	316.55 S	372.30 W	504,197.85	726,149.00	0.58	-277.22	-128.80	
7,838.00	11.59	223.86	7,789.72	316.84 S	372.57 W	504,197.56	726,148.73	0.58	-277.48	-128.76	

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Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
7,840.00	11.58	223.81	7,791.68	317.13 S	372.85 W	504,197.27	726,148.45	0.58	-277.74	-128.71	
7,842.00	11.57	223.77	7,793.64	317.42 S	373.13 W	504,196.98	726,148.17	0.58	-278.00	-128.67	
7,844.00	11.56	223.72	7,795.60	317.71 S	373.41 W	504,196.69	726,147.89	0.58	-278.26	-128.63	
7,846.00	11.56	223.67	7,797.56	318.00 S	373.68 W	504,196.40	726,147.62	0.58	-278.52	-128.58	
7,848.00	11.55	223.63	7,799.52	318.29 S	373.96 W	504,196.11	726,147.34	0.58	-278.78	-128.54	
7,850.00	11.54	223.58	7,801.48	318.58 S	374.24 W	504,195.82	726,147.06	0.58	-279.04	-128.49	
7,852.00	11.54	223.54	7,803.44	318.87 S	374.51 W	504,195.53	726,146.79	0.58	-279.30	-128.45	
7,854.00	11.53	223.49	7,805.40	319.16 S	374.79 W	504,195.24	726,146.51	0.58	-279.56	-128.40	
7,856.00	11.52	223.45	7,807.36	319.45 S	375.06 W	504,194.95	726,146.24	0.58	-279.82	-128.36	
7,858.00	11.51	223.40	7,809.32	319.74 S	375.34 W	504,194.66	726,145.96	0.58	-280.08	-128.31	
7,860.00	11.51	223.35	7,811.28	320.03 S	375.61 W	504,194.37	726,145.69	0.58	-280.34	-128.27	
7,862.00	11.50	223.31	7,813.24	320.32 S	375.89 W	504,194.08	726,145.41	0.58	-280.61	-128.22	
7,864.00	11.49	223.26	7,815.20	320.61 S	376.16 W	504,193.79	726,145.14	0.58	-280.87	-128.18	
7,866.00	11.48	223.22	7,817.16	320.90 S	376.43 W	504,193.50	726,144.87	0.58	-281.13	-128.13	
7,868.00	11.48	223.17	7,819.12	321.19 S	376.70 W	504,193.21	726,144.60	0.58	-281.39	-128.09	
7,870.00	11.47	223.12	7,821.08	321.48 S	376.98 W	504,192.92	726,144.32	0.58	-281.65	-128.04	
7,872.00	11.46	223.08	7,823.04	321.77 S	377.25 W	504,192.63	726,144.05	0.58	-281.91	-128.00	
7,874.00	11.46	223.03	7,825.00	322.06 S	377.52 W	504,192.34	726,143.78	0.58	-282.17	-127.95	
7,876.00	11.45	222.98	7,826.96	322.35 S	377.79 W	504,192.05	726,143.51	0.58	-282.43	-127.90	
7,878.00	11.44	222.94	7,828.92	322.64 S	378.06 W	504,191.76	726,143.24	0.58	-282.70	-127.86	
7,880.00	11.43	222.89	7,830.88	322.93 S	378.33 W	504,191.47	726,142.97	0.58	-282.96	-127.81	
7,882.00	11.43	222.84	7,832.84	323.22 S	378.60 W	504,191.18	726,142.70	0.58	-283.22	-127.77	
7,884.00	11.42	222.80	7,834.80	323.51 S	378.87 W	504,190.89	726,142.43	0.58	-283.48	-127.72	
7,886.00	11.41	222.75	7,836.76	323.80 S	379.14 W	504,190.60	726,142.16	0.58	-283.74	-127.68	
7,888.00	11.41	222.70	7,838.72	324.09 S	379.41 W	504,190.31	726,141.89	0.58	-284.00	-127.63	
7,890.00	11.40	222.66	7,840.68	324.38 S	379.67 W	504,190.02	726,141.63	0.58	-284.27	-127.58	
7,892.00	11.39	222.61	7,842.64	324.67 S	379.94 W	504,189.73	726,141.36	0.58	-284.53	-127.54	
7,894.00	11.38	222.56	7,844.60	324.96 S	380.21 W	504,189.44	726,141.09	0.58	-284.79	-127.49	
7,896.00	11.38	222.52	7,846.56	325.25 S	380.48 W	504,189.15	726,140.82	0.58	-285.05	-127.45	
7,898.00	11.37	222.47	7,848.53	325.54 S	380.74 W	504,188.86	726,140.56	0.58	-285.32	-127.40	
7,900.00	11.36	222.42	7,850.49	325.84 S	381.01 W	504,188.56	726,140.29	0.58	-285.58	-127.35	
7,902.00	11.36	222.37	7,852.45	326.13 S	381.27 W	504,188.27	726,140.03	0.58	-285.84	-127.31	
7,904.00	11.35	222.33	7,854.41	326.42 S	381.54 W	504,187.98	726,139.76	0.58	-286.10	-127.26	
7,906.00	11.34	222.28	7,856.37	326.71 S	381.80 W	504,187.69	726,139.50	0.58	-286.37	-127.21	
7,908.00	11.33	222.23	7,858.33	327.00 S	382.07 W	504,187.40	726,139.23	0.58	-286.63	-127.17	
7,910.00	11.33	222.18	7,860.29	327.29 S	382.33 W	504,187.11	726,138.97	0.58	-286.89	-127.12	
7,912.00	11.32	222.14	7,862.25	327.58 S	382.60 W	504,186.82	726,138.70	0.58	-287.15	-127.08	

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				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
7,914.00	11.31	222.09	7,864.21	327.87 S	382.86 W	504,186.53	726,138.44	0.58	-287.42	-127.03	
7,916.00	11.31	222.04	7,866.17	328.16 S	383.12 W	504,186.24	726,138.18	0.58	-287.68	-126.98	
7,918.00	11.30	221.99	7,868.14	328.45 S	383.38 W	504,185.95	726,137.92	0.58	-287.94	-126.94	
7,920.00	11.29	221.95	7,870.10	328.75 S	383.65 W	504,185.65	726,137.65	0.58	-288.21	-126.89	
7,922.00	11.29	221.90	7,872.06	329.04 S	383.91 W	504,185.36	726,137.39	0.58	-288.47	-126.84	
7,924.00	11.28	221.85	7,874.02	329.33 S	384.17 W	504,185.07	726,137.13	0.58	-288.73	-126.79	
7,926.00	11.27	221.80	7,875.98	329.62 S	384.43 W	504,184.78	726,136.87	0.58	-289.00	-126.75	
7,928.00	11.26	221.75	7,877.94	329.91 S	384.69 W	504,184.49	726,136.61	0.58	-289.26	-126.70	
7,930.00	11.26	221.71	7,879.90	330.20 S	384.95 W	504,184.20	726,136.35	0.58	-289.52	-126.65	
7,932.00	11.25	221.66	7,881.86	330.49 S	385.21 W	504,183.91	726,136.09	0.58	-289.79	-126.61	
7,934.00	11.24	221.61	7,883.83	330.79 S	385.47 W	504,183.61	726,135.83	0.58	-290.05	-126.56	
7,936.00	11.24	221.56	7,885.79	331.08 S	385.73 W	504,183.32	726,135.57	0.58	-290.32	-126.51	
7,938.00	11.23	221.51	7,887.75	331.37 S	385.99 W	504,183.03	726,135.31	0.58	-290.58	-126.46	
7,940.00	11.22	221.46	7,889.71	331.66 S	386.24 W	504,182.74	726,135.06	0.58	-290.84	-126.42	
7,942.00	11.22	221.42	7,891.67	331.95 S	386.50 W	504,182.45	726,134.80	0.58	-291.11	-126.37	
7,944.00	11.21	221.37	7,893.64	332.24 S	386.76 W	504,182.16	726,134.54	0.58	-291.37	-126.32	
7,946.00	11.20	221.32	7,895.60	332.54 S	387.02 W	504,181.86	726,134.28	0.58	-291.64	-126.27	
7,948.00	11.19	221.27	7,897.56	332.83 S	387.27 W	504,181.57	726,134.03	0.58	-291.90	-126.23	
7,950.00	11.19	221.22	7,899.52	333.12 S	387.53 W	504,181.28	726,133.77	0.58	-292.16	-126.18	
7,952.00	11.18	221.17	7,901.48	333.41 S	387.78 W	504,180.99	726,133.52	0.58	-292.43	-126.13	
7,954.00	11.17	221.12	7,903.44	333.70 S	388.04 W	504,180.70	726,133.26	0.58	-292.69	-126.08	
7,956.00	11.17	221.08	7,905.41	334.00 S	388.29 W	504,180.40	726,133.01	0.58	-292.96	-126.04	
7,958.00	11.16	221.03	7,907.37	334.29 S	388.55 W	504,180.11	726,132.75	0.58	-293.22	-125.99	
7,960.00	11.15	220.98	7,909.33	334.58 S	388.80 W	504,179.82	726,132.50	0.58	-293.49	-125.94	
7,962.00	11.15	220.93	7,911.29	334.87 S	389.06 W	504,179.53	726,132.24	0.58	-293.75	-125.89	
7,964.00	11.14	220.88	7,913.26	335.16 S	389.31 W	504,179.24	726,131.99	0.58	-294.02	-125.84	
7,966.00	11.13	220.87	7,915.22	335.46 S	389.56 W	504,178.94	726,131.74	0.33	-294.28	-169.82	
7,968.00	11.13	220.87	7,917.18	335.75 S	389.81 W	504,178.65	726,131.49	0.33	-294.55	-169.81	
7,970.00	11.12	220.86	7,919.14	336.04 S	390.07 W	504,178.36	726,131.23	0.33	-294.81	-169.81	
7,972.00	11.11	220.86	7,921.11	336.33 S	390.32 W	504,178.07	726,130.98	0.33	-295.08	-169.80	
7,974.00	11.11	220.85	7,923.07	336.62 S	390.57 W	504,177.78	726,130.73	0.33	-295.34	-169.80	
7,976.00	11.10	220.84	7,925.03	336.91 S	390.82 W	504,177.49	726,130.48	0.33	-295.61	-169.79	
7,978.00	11.09	220.84	7,926.99	337.21 S	391.07 W	504,177.19	726,130.23	0.33	-295.87	-169.78	
7,980.00	11.09	220.83	7,928.96	337.50 S	391.33 W	504,176.90	726,129.97	0.33	-296.13	-169.78	
7,982.00	11.08	220.83	7,930.92	337.79 S	391.58 W	504,176.61	726,129.72	0.33	-296.40	-169.77	
7,984.00	11.08	220.82	7,932.88	338.08 S	391.83 W	504,176.32	726,129.47	0.33	-296.66	-169.77	

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Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
7,986.00	11.07	220.81	7,934.84	338.37 S	392.08 W	504,176.03	726,129.22	0.33	-296.93	-169.76	
7,988.00	11.06	220.81	7,936.81	338.66 S	392.33 W	504,175.74	726,128.97	0.33	-297.19	-169.75	
7,990.00	11.06	220.80	7,938.77	338.95 S	392.58 W	504,175.45	726,128.72	0.33	-297.45	-169.75	
7,992.00	11.05	220.80	7,940.73	339.24 S	392.83 W	504,175.16	726,128.47	0.33	-297.72	-169.74	
7,994.00	11.04	220.79	7,942.70	339.53 S	393.08 W	504,174.87	726,128.22	0.33	-297.98	-169.74	
7,996.00	11.04	220.78	7,944.66	339.82 S	393.33 W	504,174.58	726,127.97	0.33	-298.24	-169.73	
7,998.00	11.03	220.78	7,946.62	340.11 S	393.58 W	504,174.29	726,127.72	0.33	-298.51	-169.72	
8,000.00	11.02	220.77	7,948.58	340.40 S	393.83 W	504,174.00	726,127.47	0.33	-298.77	-169.72	
8,002.00	11.02	220.76	7,950.55	340.69 S	394.08 W	504,173.71	726,127.22	0.33	-299.03	-169.71	
8,004.00	11.01	220.76	7,952.51	340.98 S	394.33 W	504,173.42	726,126.97	0.33	-299.29	-169.71	
8,006.00	11.00	220.75	7,954.47	341.27 S	394.58 W	504,173.13	726,126.72	0.33	-299.56	-169.70	
8,008.00	11.00	220.75	7,956.44	341.56 S	394.83 W	504,172.84	726,126.47	0.33	-299.82	-169.69	
8,010.00	10.99	220.74	7,958.40	341.85 S	395.08 W	504,172.55	726,126.22	0.33	-300.08	-169.69	
8,012.00	10.98	220.73	7,960.36	342.14 S	395.33 W	504,172.26	726,125.97	0.33	-300.34	-169.68	
8,014.00	10.98	220.73	7,962.33	342.42 S	395.58 W	504,171.98	726,125.72	0.33	-300.61	-169.68	
8,016.00	10.97	220.72	7,964.29	342.71 S	395.82 W	504,171.69	726,125.48	0.33	-300.87	-169.67	
8,018.00	10.97	220.72	7,966.25	343.00 S	396.07 W	504,171.40	726,125.23	0.33	-301.13	-169.66	
8,020.00	10.96	220.71	7,968.22	343.29 S	396.32 W	504,171.11	726,124.98	0.33	-301.39	-169.66	
8,022.00	10.95	220.70	7,970.18	343.58 S	396.57 W	504,170.82	726,124.73	0.33	-301.65	-169.65	
8,024.00	10.95	220.70	7,972.14	343.87 S	396.82 W	504,170.53	726,124.48	0.33	-301.91	-169.65	
8,026.00	10.94	220.69	7,974.11	344.15 S	397.06 W	504,170.25	726,124.24	0.33	-302.18	-169.64	
8,028.00	10.93	220.68	7,976.07	344.44 S	397.31 W	504,169.96	726,123.99	0.33	-302.44	-169.63	
8,030.00	10.93	220.68	7,978.04	344.73 S	397.56 W	504,169.67	726,123.74	0.33	-302.70	-169.63	
8,032.00	10.92	220.67	7,980.00	345.02 S	397.81 W	504,169.38	726,123.49	0.33	-302.96	-169.62	
8,034.00	10.91	220.67	7,981.96	345.30 S	398.05 W	504,169.10	726,123.25	0.33	-303.22	-169.61	
8,036.00	10.91	220.66	7,983.93	345.59 S	398.30 W	504,168.81	726,123.00	0.33	-303.48	-169.61	
8,038.00	10.90	220.65	7,985.89	345.88 S	398.55 W	504,168.52	726,122.75	0.33	-303.74	-169.60	
8,040.00	10.89	220.65	7,987.86	346.16 S	398.79 W	504,168.24	726,122.51	0.33	-304.00	-169.60	
8,042.00	10.89	220.64	7,989.82	346.45 S	399.04 W	504,167.95	726,122.26	0.33	-304.26	-169.59	
8,044.00	10.88	220.63	7,991.78	346.74 S	399.28 W	504,167.66	726,122.02	0.33	-304.52	-169.58	
8,046.00	10.88	220.63	7,993.75	347.02 S	399.53 W	504,167.38	726,121.77	0.33	-304.78	-169.58	
8,048.00	10.87	220.62	7,995.71	347.31 S	399.78 W	504,167.09	726,121.52	0.33	-305.04	-169.57	
8,050.00	10.86	220.62	7,997.68	347.60 S	400.02 W	504,166.80	726,121.28	0.33	-305.30	-169.57	
8,052.00	10.86	220.61	7,999.64	347.88 S	400.27 W	504,166.52	726,121.03	0.33	-305.56	-169.56	
8,054.00	10.85	220.60	8,001.60	348.17 S	400.51 W	504,166.23	726,120.79	0.33	-305.82	-169.55	
8,056.00	10.84	220.60	8,003.57	348.45 S	400.76 W	504,165.95	726,120.54	0.33	-306.08	-169.55	
8,058.00	10.84	220.59	8,005.53	348.74 S	401.00 W	504,165.66	726,120.30	0.33	-306.34	-169.54	

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Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
8,060.00	10.83	220.58	8,007.50	349.03 S	401.25 W	504,165.37	726,120.05	0.33	-306.60	-169.53	
8,062.00	10.82	220.58	8,009.46	349.31 S	401.49 W	504,165.09	726,119.81	0.33	-306.86	-169.53	
8,064.00	10.82	220.57	8,011.43	349.60 S	401.73 W	504,164.80	726,119.57	0.33	-307.12	-169.52	
8,066.00	10.81	220.56	8,013.39	349.88 S	401.98 W	504,164.52	726,119.32	0.33	-307.38	-169.52	
8,068.00	10.80	220.56	8,015.35	350.17 S	402.22 W	504,164.23	726,119.08	0.33	-307.64	-169.51	
8,070.00	10.80	220.55	8,017.32	350.45 S	402.47 W	504,163.95	726,118.83	0.33	-307.89	-169.50	
8,072.00	10.79	220.55	8,019.28	350.74 S	402.71 W	504,163.66	726,118.59	0.33	-308.15	-169.50	
8,074.00	10.78	220.54	8,021.25	351.02 S	402.95 W	504,163.38	726,118.35	0.33	-308.41	-169.49	
8,076.00	10.78	220.53	8,023.21	351.30 S	403.20 W	504,163.10	726,118.10	0.33	-308.67	-169.48	
8,078.00	10.77	220.53	8,025.18	351.59 S	403.44 W	504,162.81	726,117.86	0.33	-308.93	-169.48	
8,080.00	10.77	220.52	8,027.14	351.87 S	403.68 W	504,162.53	726,117.62	0.33	-309.19	-169.47	
8,082.00	10.76	220.51	8,029.11	352.16 S	403.92 W	504,162.24	726,117.38	0.33	-309.44	-169.47	
8,084.00	10.75	220.51	8,031.07	352.44 S	404.17 W	504,161.96	726,117.13	0.33	-309.70	-169.46	
8,086.00	10.75	220.50	8,033.04	352.72 S	404.41 W	504,161.68	726,116.89	0.33	-309.96	-169.45	
8,088.00	10.74	220.49	8,035.00	353.01 S	404.65 W	504,161.39	726,116.65	0.33	-310.22	-169.45	
8,090.00	10.73	220.49	8,036.97	353.29 S	404.89 W	504,161.11	726,116.41	0.33	-310.47	-169.44	
8,092.00	10.73	220.48	8,038.93	353.57 S	405.13 W	504,160.83	726,116.17	0.33	-310.73	-169.43	
8,094.00	10.72	220.47	8,040.90	353.86 S	405.38 W	504,160.54	726,115.92	0.33	-310.99	-169.43	
8,096.00	10.71	220.47	8,042.86	354.14 S	405.62 W	504,160.26	726,115.68	0.33	-311.24	-169.42	
8,098.00	10.71	220.46	8,044.83	354.42 S	405.86 W	504,159.98	726,115.44	0.33	-311.50	-169.41	
8,100.00	10.70	220.46	8,046.79	354.71 S	406.10 W	504,159.69	726,115.20	0.33	-311.76	-169.41	
8,102.00	10.69	220.45	8,048.76	354.99 S	406.34 W	504,159.41	726,114.96	0.33	-312.02	-169.40	
8,104.00	10.69	220.44	8,050.72	355.27 S	406.58 W	504,159.13	726,114.72	0.33	-312.27	-169.40	
8,106.00	10.68	220.44	8,052.69	355.55 S	406.82 W	504,158.85	726,114.48	0.33	-312.53	-169.39	
8,108.00	10.68	220.43	8,054.65	355.83 S	407.06 W	504,158.57	726,114.24	0.33	-312.78	-169.38	
8,110.00	10.67	220.42	8,056.62	356.12 S	407.30 W	504,158.28	726,114.00	0.33	-313.04	-169.38	
8,112.00	10.66	220.42	8,058.58	356.40 S	407.54 W	504,158.00	726,113.76	0.33	-313.30	-169.37	
8,114.00	10.66	220.41	8,060.55	356.68 S	407.78 W	504,157.72	726,113.52	0.33	-313.55	-169.36	
8,116.00	10.65	220.40	8,062.52	356.96 S	408.02 W	504,157.44	726,113.28	0.33	-313.81	-169.36	
8,118.00	10.64	220.40	8,064.48	357.24 S	408.26 W	504,157.16	726,113.04	0.33	-314.06	-169.35	
8,120.00	10.64	220.39	8,066.45	357.52 S	408.50 W	504,156.88	726,112.80	0.33	-314.32	-169.34	
8,122.00	10.63	220.38	8,068.41	357.81 S	408.74 W	504,156.59	726,112.56	0.33	-314.58	-169.34	
8,124.00	10.62	220.38	8,070.38	358.09 S	408.98 W	504,156.31	726,112.32	0.33	-314.83	-169.33	
8,126.00	10.62	220.37	8,072.34	358.37 S	409.22 W	504,156.03	726,112.08	0.33	-315.09	-169.32	
8,128.00	10.61	220.36	8,074.31	358.65 S	409.46 W	504,155.75	726,111.84	0.33	-315.34	-169.32	
8,130.00	10.60	220.36	8,076.28	358.93 S	409.69 W	504,155.47	726,111.61	0.33	-315.60	-169.31	
8,132.00	10.60	220.35	8,078.24	359.21 S	409.93 W	504,155.19	726,111.37	0.33	-315.85	-169.30	

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				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
8,134.00	10.59	220.34	8,080.21	359.49 S	410.17 W	504,154.91	726,111.13	0.33	-316.11	-169.30	
8,136.00	10.58	220.34	8,082.17	359.77 S	410.41 W	504,154.63	726,110.89	0.33	-316.36	-169.29	
8,138.00	10.58	220.33	8,084.14	360.05 S	410.65 W	504,154.35	726,110.65	0.33	-316.61	-169.29	
8,140.00	10.57	220.32	8,086.11	360.33 S	410.88 W	504,154.07	726,110.42	0.33	-316.87	-169.28	
8,142.00	10.57	220.32	8,088.07	360.61 S	411.12 W	504,153.79	726,110.18	0.33	-317.12	-169.27	
8,144.00	10.56	220.31	8,090.04	360.89 S	411.36 W	504,153.51	726,109.94	0.33	-317.38	-169.27	
8,146.00	10.55	220.30	8,092.00	361.17 S	411.60 W	504,153.23	726,109.70	0.33	-317.63	-169.26	
8,148.00	10.55	220.30	8,093.97	361.45 S	411.83 W	504,152.95	726,109.47	0.33	-317.88	-169.25	
8,150.00	10.54	220.29	8,095.94	361.73 S	412.07 W	504,152.67	726,109.23	0.33	-318.14	-169.25	
8,152.00	10.53	220.28	8,097.90	362.00 S	412.31 W	504,152.40	726,108.99	0.33	-318.39	-169.24	
8,154.00	10.53	220.31	8,099.87	362.28 S	412.54 W	504,152.12	726,108.76	0.29	-318.65	122.43	
8,156.00	10.53	220.37	8,101.84	362.56 S	412.78 W	504,151.84	726,108.52	0.54	-318.90	88.30	
8,158.00	10.53	220.43	8,103.80	362.84 S	413.01 W	504,151.56	726,108.29	0.54	-319.15	88.24	
8,160.00	10.53	220.49	8,105.77	363.12 S	413.25 W	504,151.28	726,108.05	0.54	-319.40	88.18	
8,162.00	10.53	220.55	8,107.73	363.40 S	413.49 W	504,151.00	726,107.81	0.54	-319.66	88.12	
8,164.00	10.53	220.61	8,109.70	363.67 S	413.73 W	504,150.73	726,107.57	0.54	-319.91	88.07	
8,166.00	10.53	220.67	8,111.67	363.95 S	413.97 W	504,150.45	726,107.33	0.54	-320.16	88.01	
8,168.00	10.53	220.73	8,113.63	364.23 S	414.20 W	504,150.17	726,107.10	0.54	-320.41	87.95	
8,170.00	10.53	220.79	8,115.60	364.51 S	414.44 W	504,149.89	726,106.86	0.54	-320.66	87.89	
8,172.00	10.53	220.85	8,117.57	364.78 S	414.68 W	504,149.62	726,106.62	0.54	-320.91	87.83	
8,174.00	10.53	220.90	8,119.53	365.06 S	414.92 W	504,149.34	726,106.38	0.54	-321.17	87.77	
8,176.00	10.53	220.96	8,121.50	365.33 S	415.16 W	504,149.07	726,106.14	0.54	-321.42	87.71	
8,178.00	10.53	221.02	8,123.46	365.61 S	415.40 W	504,148.79	726,105.90	0.54	-321.67	87.66	
8,180.00	10.54	221.08	8,125.43	365.89 S	415.64 W	504,148.51	726,105.66	0.54	-321.92	87.60	
8,182.00	10.54	221.14	8,127.40	366.16 S	415.88 W	504,148.24	726,105.42	0.54	-322.17	87.54	
8,184.00	10.54	221.20	8,129.36	366.44 S	416.12 W	504,147.96	726,105.18	0.54	-322.42	87.48	
8,186.00	10.54	221.26	8,131.33	366.71 S	416.36 W	504,147.69	726,104.94	0.54	-322.66	87.42	
8,188.00	10.54	221.32	8,133.30	366.99 S	416.60 W	504,147.41	726,104.70	0.54	-322.91	87.36	
8,190.00	10.54	221.38	8,135.26	367.26 S	416.85 W	504,147.14	726,104.45	0.54	-323.16	87.31	
8,192.00	10.54	221.44	8,137.23	367.54 S	417.09 W	504,146.86	726,104.21	0.54	-323.41	87.25	
8,194.00	10.54	221.50	8,139.19	367.81 S	417.33 W	504,146.59	726,103.97	0.54	-323.66	87.19	
8,196.00	10.54	221.56	8,141.16	368.08 S	417.57 W	504,146.32	726,103.73	0.54	-323.91	87.13	
8,198.00	10.54	221.62	8,143.13	368.36 S	417.82 W	504,146.04	726,103.48	0.54	-324.15	87.07	
8,200.00	10.54	221.68	8,145.09	368.63 S	418.06 W	504,145.77	726,103.24	0.54	-324.40	87.01	
8,202.00	10.54	221.74	8,147.06	368.90 S	418.30 W	504,145.50	726,103.00	0.54	-324.65	86.95	
8,204.00	10.54	221.80	8,149.03	369.18 S	418.55 W	504,145.22	726,102.75	0.54	-324.90	86.90	

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				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
8,206.00	10.54	221.86	8,150.99	369.45 S	418.79 W	504,144.95	726,102.51	0.54	-325.14	86.84	
8,208.00	10.54	221.91	8,152.96	369.72 S	419.03 W	504,144.68	726,102.27	0.54	-325.39	86.78	
8,210.00	10.54	221.97	8,154.92	369.99 S	419.28 W	504,144.41	726,102.02	0.54	-325.63	86.72	
8,212.00	10.54	222.03	8,156.89	370.27 S	419.52 W	504,144.13	726,101.78	0.54	-325.88	86.66	
8,214.00	10.54	222.09	8,158.86	370.54 S	419.77 W	504,143.86	726,101.53	0.54	-326.13	86.60	
8,216.00	10.55	222.15	8,160.82	370.81 S	420.01 W	504,143.59	726,101.29	0.54	-326.37	86.55	
8,218.00	10.55	222.21	8,162.79	371.08 S	420.26 W	504,143.32	726,101.04	0.54	-326.62	86.49	
8,220.00	10.55	222.27	8,164.76	371.35 S	420.51 W	504,143.05	726,100.79	0.54	-326.86	86.43	
8,222.00	10.55	222.33	8,166.72	371.62 S	420.75 W	504,142.78	726,100.55	0.54	-327.11	86.37	
8,224.00	10.55	222.39	8,168.69	371.89 S	421.00 W	504,142.51	726,100.30	0.54	-327.35	86.31	
8,226.00	10.55	222.45	8,170.65	372.16 S	421.25 W	504,142.24	726,100.05	0.54	-327.59	86.25	
8,228.00	10.55	222.51	8,172.62	372.43 S	421.49 W	504,141.97	726,099.81	0.54	-327.84	86.20	
8,230.00	10.55	222.57	8,174.59	372.70 S	421.74 W	504,141.70	726,099.56	0.54	-328.08	86.14	
8,232.00	10.55	222.63	8,176.55	372.97 S	421.99 W	504,141.43	726,099.31	0.54	-328.32	86.08	
8,234.00	10.55	222.69	8,178.52	373.24 S	422.24 W	504,141.16	726,099.06	0.54	-328.57	86.02	
8,236.00	10.55	222.75	8,180.49	373.51 S	422.49 W	504,140.89	726,098.81	0.54	-328.81	85.96	
8,238.00	10.55	222.80	8,182.45	373.78 S	422.73 W	504,140.62	726,098.57	0.54	-329.05	85.91	
8,240.00	10.55	222.86	8,184.42	374.05 S	422.98 W	504,140.35	726,098.32	0.54	-329.29	85.85	
8,242.00	10.56	222.92	8,186.38	374.32 S	423.23 W	504,140.08	726,098.07	0.54	-329.53	85.79	
8,244.00	10.56	222.98	8,188.35	374.59 S	423.48 W	504,139.81	726,097.82	0.54	-329.78	85.73	
8,246.00	10.56	223.04	8,190.32	374.85 S	423.73 W	504,139.55	726,097.57	0.54	-330.02	85.67	
8,248.00	10.56	223.10	8,192.28	375.12 S	423.98 W	504,139.28	726,097.32	0.54	-330.26	85.61	
8,250.00	10.56	223.16	8,194.25	375.39 S	424.23 W	504,139.01	726,097.07	0.54	-330.50	85.56	
8,252.00	10.56	223.22	8,196.21	375.66 S	424.48 W	504,138.74	726,096.82	0.54	-330.74	85.50	
8,254.00	10.56	223.28	8,198.18	375.92 S	424.73 W	504,138.48	726,096.57	0.54	-330.98	85.44	
8,256.00	10.56	223.34	8,200.15	376.19 S	424.99 W	504,138.21	726,096.31	0.54	-331.22	85.38	
8,258.00	10.56	223.40	8,202.11	376.46 S	425.24 W	504,137.94	726,096.06	0.54	-331.46	85.32	
8,260.00	10.56	223.46	8,204.08	376.72 S	425.49 W	504,137.68	726,095.81	0.54	-331.70	85.26	
8,262.00	10.56	223.51	8,206.05	376.99 S	425.74 W	504,137.41	726,095.56	0.54	-331.94	85.21	
8,264.00	10.56	223.57	8,208.01	377.25 S	425.99 W	504,137.15	726,095.31	0.54	-332.18	85.15	
8,266.00	10.57	223.63	8,209.98	377.52 S	426.25 W	504,136.88	726,095.05	0.54	-332.42	85.09	
8,268.00	10.57	223.69	8,211.94	377.78 S	426.50 W	504,136.62	726,094.80	0.54	-332.65	85.03	
8,270.00	10.57	223.75	8,213.91	378.05 S	426.75 W	504,136.35	726,094.55	0.54	-332.89	84.97	
8,272.00	10.57	223.81	8,215.88	378.31 S	427.01 W	504,136.09	726,094.29	0.54	-333.13	84.92	
8,274.00	10.57	223.87	8,217.84	378.58 S	427.26 W	504,135.82	726,094.04	0.54	-333.37	84.86	
8,276.00	10.57	223.93	8,219.81	378.84 S	427.52 W	504,135.56	726,093.78	0.54	-333.60	84.80	
8,278.00	10.57	223.99	8,221.77	379.11 S	427.77 W	504,135.29	726,093.53	0.54	-333.84	84.74	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
8,280.00	10.57	224.05	8,223.74	379.37 S	428.03 W	504,135.03	726,093.27	0.54	-334.08	84.68	
8,282.00	10.57	224.11	8,225.71	379.64 S	428.28 W	504,134.76	726,093.02	0.54	-334.31	84.63	
8,284.00	10.57	224.16	8,227.67	379.90 S	428.54 W	504,134.50	726,092.76	0.54	-334.55	84.57	
8,286.00	10.58	224.22	8,229.64	380.16 S	428.79 W	504,134.24	726,092.51	0.54	-334.79	84.51	
8,288.00	10.58	224.28	8,231.60	380.42 S	429.05 W	504,133.98	726,092.25	0.54	-335.02	84.45	
8,290.00	10.58	224.34	8,233.57	380.69 S	429.31 W	504,133.71	726,091.99	0.54	-335.26	84.39	
8,292.00	10.58	224.40	8,235.54	380.95 S	429.56 W	504,133.45	726,091.74	0.54	-335.49	84.34	
8,294.00	10.58	224.46	8,237.50	381.21 S	429.82 W	504,133.19	726,091.48	0.54	-335.73	84.28	
8,296.00	10.58	224.52	8,239.47	381.47 S	430.08 W	504,132.93	726,091.22	0.54	-335.96	84.22	
8,298.00	10.58	224.58	8,241.43	381.74 S	430.33 W	504,132.66	726,090.97	0.54	-336.20	84.16	
8,300.00	10.58	224.64	8,243.40	382.00 S	430.59 W	504,132.40	726,090.71	0.54	-336.43	84.10	
8,302.00	10.58	224.70	8,245.37	382.26 S	430.85 W	504,132.14	726,090.45	0.54	-336.66	84.05	
8,304.00	10.59	224.75	8,247.33	382.52 S	431.11 W	504,131.88	726,090.19	0.54	-336.90	83.99	
8,306.00	10.59	224.81	8,249.30	382.78 S	431.37 W	504,131.62	726,089.93	0.54	-337.13	83.93	
8,308.00	10.59	224.87	8,251.26	383.04 S	431.63 W	504,131.36	726,089.67	0.54	-337.36	83.87	
8,310.00	10.59	224.93	8,253.23	383.30 S	431.89 W	504,131.10	726,089.41	0.54	-337.60	83.81	
8,312.00	10.59	224.99	8,255.20	383.56 S	432.15 W	504,130.84	726,089.15	0.54	-337.83	83.76	
8,314.00	10.59	225.05	8,257.16	383.82 S	432.41 W	504,130.58	726,088.89	0.54	-338.06	83.70	
8,316.00	10.59	225.11	8,259.13	384.08 S	432.67 W	504,130.32	726,088.63	0.54	-338.29	83.64	
8,318.00	10.59	225.17	8,261.09	384.34 S	432.93 W	504,130.06	726,088.37	0.54	-338.52	83.58	
8,320.00	10.60	225.22	8,263.06	384.60 S	433.19 W	504,129.80	726,088.11	0.54	-338.76	83.53	
8,322.00	10.60	225.28	8,265.03	384.86 S	433.45 W	504,129.54	726,087.85	0.54	-338.99	83.47	
8,324.00	10.60	225.34	8,266.99	385.12 S	433.71 W	504,129.28	726,087.59	0.54	-339.22	83.41	
8,326.00	10.60	225.40	8,268.96	385.38 S	433.97 W	504,129.02	726,087.33	0.54	-339.45	83.35	
8,328.00	10.60	225.46	8,270.92	385.63 S	434.23 W	504,128.77	726,087.07	0.54	-339.68	83.29	
8,330.00	10.60	225.52	8,272.89	385.89 S	434.50 W	504,128.51	726,086.80	0.54	-339.91	83.24	
8,332.00	10.60	225.58	8,274.85	386.15 S	434.76 W	504,128.25	726,086.54	0.54	-340.14	83.18	
8,334.00	10.60	225.64	8,276.82	386.41 S	435.02 W	504,127.99	726,086.28	0.54	-340.37	83.12	
8,336.00	10.61	225.69	8,278.79	386.66 S	435.29 W	504,127.74	726,086.01	0.54	-340.60	83.06	
8,338.00	10.61	225.75	8,280.75	386.92 S	435.55 W	504,127.48	726,085.75	0.54	-340.83	83.01	
8,340.00	10.61	225.81	8,282.72	387.18 S	435.81 W	504,127.22	726,085.49	0.54	-341.05	82.95	
8,342.00	10.61	225.87	8,284.68	387.43 S	436.08 W	504,126.97	726,085.22	0.54	-341.28	82.89	
8,344.00	10.61	225.97	8,286.65	387.69 S	436.34 W	504,126.71	726,084.96	0.90	-341.51	95.85	
8,346.00	10.60	226.10	8,288.62	387.95 S	436.61 W	504,126.45	726,084.69	1.27	-341.74	101.28	
8,348.00	10.60	226.24	8,290.58	388.20 S	436.87 W	504,126.20	726,084.43	1.27	-341.97	101.14	
8,350.00	10.59	226.38	8,292.55	388.45 S	437.14 W	504,125.95	726,084.16	1.27	-342.19	101.01	
8,352.00	10.59	226.51	8,294.51	388.71 S	437.40 W	504,125.69	726,083.90	1.27	-342.42	100.88	

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Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
8,354.00	10.58	226.65	8,296.48	388.96 S	437.67 W	504,125.44	726,083.63	1.27	-342.64	100.74	
8,356.00	10.58	226.78	8,298.45	389.21 S	437.94 W	504,125.19	726,083.36	1.27	-342.86	100.61	
8,358.00	10.57	226.92	8,300.41	389.46 S	438.21 W	504,124.94	726,083.09	1.27	-343.09	100.47	
8,360.00	10.57	227.06	8,302.38	389.71 S	438.47 W	504,124.69	726,082.83	1.27	-343.31	100.34	
8,362.00	10.57	227.19	8,304.34	389.96 S	438.74 W	504,124.44	726,082.56	1.27	-343.53	100.21	
8,364.00	10.56	227.33	8,306.31	390.21 S	439.01 W	504,124.19	726,082.29	1.27	-343.75	100.07	
8,366.00	10.56	227.47	8,308.28	390.46 S	439.28 W	504,123.94	726,082.02	1.27	-343.97	99.94	
8,368.00	10.55	227.60	8,310.24	390.71 S	439.55 W	504,123.69	726,081.75	1.27	-344.19	99.80	
8,370.00	10.55	227.74	8,312.21	390.95 S	439.82 W	504,123.45	726,081.48	1.27	-344.41	99.67	
8,372.00	10.54	227.88	8,314.17	391.20 S	440.09 W	504,123.20	726,081.21	1.27	-344.62	99.53	
8,374.00	10.54	228.02	8,316.14	391.44 S	440.37 W	504,122.96	726,080.93	1.27	-344.84	99.40	
8,376.00	10.54	228.15	8,318.11	391.69 S	440.64 W	504,122.71	726,080.66	1.27	-345.05	99.26	
8,378.00	10.53	228.29	8,320.07	391.93 S	440.91 W	504,122.47	726,080.39	1.27	-345.27	99.13	
8,380.00	10.53	228.43	8,322.04	392.18 S	441.18 W	504,122.22	726,080.12	1.27	-345.48	98.99	
8,382.00	10.52	228.57	8,324.01	392.42 S	441.46 W	504,121.98	726,079.84	1.27	-345.70	98.86	
8,384.00	10.52	228.70	8,325.97	392.66 S	441.73 W	504,121.74	726,079.57	1.27	-345.91	98.72	
8,386.00	10.52	228.84	8,327.94	392.90 S	442.01 W	504,121.50	726,079.29	1.27	-346.12	98.59	
8,388.00	10.51	228.98	8,329.90	393.14 S	442.28 W	504,121.26	726,079.02	1.27	-346.33	98.45	
8,390.00	10.51	229.12	8,331.87	393.38 S	442.56 W	504,121.02	726,078.74	1.27	-346.54	98.31	
8,392.00	10.50	229.26	8,333.84	393.62 S	442.83 W	504,120.78	726,078.47	1.27	-346.75	98.18	
8,394.00	10.50	229.40	8,335.80	393.85 S	443.11 W	504,120.55	726,078.19	1.27	-346.96	98.04	
8,396.00	10.50	229.53	8,337.77	394.09 S	443.39 W	504,120.31	726,077.91	1.27	-347.17	97.91	
8,398.00	10.49	229.67	8,339.74	394.33 S	443.66 W	504,120.07	726,077.64	1.27	-347.37	97.77	
8,400.00	10.49	229.81	8,341.70	394.56 S	443.94 W	504,119.84	726,077.36	1.27	-347.58	97.63	
8,402.00	10.49	229.95	8,343.67	394.80 S	444.22 W	504,119.60	726,077.08	1.27	-347.78	97.50	
8,404.00	10.48	230.09	8,345.64	395.03 S	444.50 W	504,119.37	726,076.80	1.27	-347.99	97.36	
8,406.00	10.48	230.23	8,347.60	395.26 S	444.78 W	504,119.14	726,076.52	1.27	-348.19	97.22	
8,408.00	10.48	230.37	8,349.57	395.50 S	445.06 W	504,118.90	726,076.24	1.27	-348.40	97.09	
8,410.00	10.48	230.51	8,351.54	395.73 S	445.34 W	504,118.67	726,075.96	1.27	-348.60	96.95	
8,412.00	10.47	230.64	8,353.50	395.96 S	445.62 W	504,118.44	726,075.68	1.27	-348.80	96.81	
8,414.00	10.47	230.78	8,355.47	396.19 S	445.90 W	504,118.21	726,075.40	1.27	-349.00	96.68	
8,416.00	10.47	230.92	8,357.44	396.42 S	446.18 W	504,117.98	726,075.12	1.27	-349.20	96.54	
8,418.00	10.46	231.06	8,359.40	396.65 S	446.47 W	504,117.75	726,074.83	1.27	-349.40	96.40	
8,420.00	10.46	231.20	8,361.37	396.88 S	446.75 W	504,117.52	726,074.55	1.27	-349.60	96.27	
8,422.00	10.46	231.34	8,363.34	397.10 S	447.03 W	504,117.30	726,074.27	1.27	-349.79	96.13	
8,424.00	10.46	231.48	8,365.30	397.33 S	447.32 W	504,117.07	726,073.98	1.27	-349.99	95.99	

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Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
8,426.00	10.45	231.62	8,367.27	397.55 S	447.60 W	504,116.85	726,073.70	1.27	-350.19	95.86	
8,428.00	10.45	231.76	8,369.24	397.78 S	447.88 W	504,116.62	726,073.42	1.27	-350.38	95.72	
8,430.00	10.45	231.90	8,371.20	398.00 S	448.17 W	504,116.40	726,073.13	1.27	-350.57	95.58	
8,432.00	10.45	232.04	8,373.17	398.23 S	448.46 W	504,116.17	726,072.84	1.27	-350.77	95.44	
8,434.00	10.44	232.18	8,375.14	398.45 S	448.74 W	504,115.95	726,072.56	1.27	-350.96	95.31	
8,436.00	10.44	232.32	8,377.11	398.67 S	449.03 W	504,115.73	726,072.27	1.27	-351.15	95.17	
8,438.00	10.44	232.42	8,379.07	398.89 S	449.31 W	504,115.51	726,071.99	0.95	-351.34	80.53	
8,440.00	10.45	232.49	8,381.04	399.11 S	449.60 W	504,115.29	726,071.70	0.74	-351.53	55.06	
8,442.00	10.46	232.56	8,383.01	399.33 S	449.89 W	504,115.07	726,071.41	0.74	-351.72	55.00	
8,444.00	10.47	232.63	8,384.97	399.56 S	450.18 W	504,114.84	726,071.12	0.74	-351.91	54.93	
8,446.00	10.48	232.69	8,386.94	399.78 S	450.47 W	504,114.62	726,070.83	0.74	-352.10	54.87	
8,448.00	10.49	232.76	8,388.91	400.00 S	450.76 W	504,114.40	726,070.54	0.74	-352.29	54.80	
8,450.00	10.50	232.83	8,390.87	400.22 S	451.05 W	504,114.18	726,070.25	0.74	-352.48	54.74	
8,452.00	10.50	232.89	8,392.84	400.44 S	451.34 W	504,113.96	726,069.96	0.74	-352.67	54.67	
8,454.00	10.51	232.96	8,394.81	400.66 S	451.63 W	504,113.74	726,069.67	0.74	-352.86	54.60	
8,456.00	10.52	233.03	8,396.77	400.88 S	451.92 W	504,113.52	726,069.38	0.74	-353.05	54.54	
8,458.00	10.53	233.09	8,398.74	401.10 S	452.21 W	504,113.30	726,069.09	0.74	-353.24	54.47	
8,460.00	10.54	233.16	8,400.70	401.32 S	452.51 W	504,113.08	726,068.79	0.74	-353.43	54.41	
8,462.00	10.55	233.22	8,402.67	401.53 S	452.80 W	504,112.87	726,068.50	0.74	-353.62	54.34	
8,464.00	10.56	233.29	8,404.64	401.75 S	453.09 W	504,112.65	726,068.21	0.74	-353.81	54.28	
8,466.00	10.56	233.36	8,406.60	401.97 S	453.39 W	504,112.43	726,067.91	0.74	-353.99	54.21	
8,468.00	10.57	233.42	8,408.57	402.19 S	453.68 W	504,112.21	726,067.62	0.74	-354.18	54.15	
8,470.00	10.58	233.49	8,410.53	402.41 S	453.98 W	504,111.99	726,067.32	0.74	-354.37	54.08	
8,472.00	10.59	233.55	8,412.50	402.63 S	454.27 W	504,111.77	726,067.03	0.74	-354.56	54.02	
8,474.00	10.60	233.62	8,414.47	402.85 S	454.57 W	504,111.55	726,066.73	0.74	-354.74	53.95	
8,476.00	10.61	233.68	8,416.43	403.07 S	454.86 W	504,111.33	726,066.44	0.74	-354.93	53.89	
8,478.00	10.62	233.75	8,418.40	403.28 S	455.16 W	504,111.12	726,066.14	0.74	-355.12	53.83	
8,480.00	10.63	233.81	8,420.36	403.50 S	455.46 W	504,110.90	726,065.84	0.74	-355.31	53.76	
8,482.00	10.64	233.88	8,422.33	403.72 S	455.76 W	504,110.68	726,065.54	0.74	-355.49	53.70	
8,484.00	10.64	233.94	8,424.30	403.94 S	456.05 W	504,110.46	726,065.25	0.74	-355.68	53.63	
8,486.00	10.65	234.01	8,426.26	404.15 S	456.35 W	504,110.25	726,064.95	0.74	-355.86	53.57	
8,488.00	10.66	234.07	8,428.23	404.37 S	456.65 W	504,110.03	726,064.65	0.74	-356.05	53.51	
8,490.00	10.67	234.14	8,430.19	404.59 S	456.95 W	504,109.81	726,064.35	0.74	-356.23	53.44	
8,492.00	10.68	234.20	8,432.16	404.80 S	457.25 W	504,109.60	726,064.05	0.74	-356.42	53.38	
8,494.00	10.69	234.27	8,434.12	405.02 S	457.55 W	504,109.38	726,063.75	0.74	-356.61	53.32	
8,496.00	10.70	234.33	8,436.09	405.24 S	457.85 W	504,109.16	726,063.45	0.74	-356.79	53.25	
8,498.00	10.71	234.40	8,438.05	405.45 S	458.16 W	504,108.95	726,063.14	0.74	-356.98	53.19	

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Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
8,500.00	10.72	234.46	8,440.02	405.67 S	458.46 W	504,108.73	726,062.84	0.74	-357.16	53.13	
8,502.00	10.72	234.52	8,441.98	405.89 S	458.76 W	504,108.51	726,062.54	0.74	-357.34	53.06	
8,504.00	10.73	234.59	8,443.95	406.10 S	459.06 W	504,108.30	726,062.24	0.74	-357.53	53.00	
8,506.00	10.74	234.65	8,445.91	406.32 S	459.37 W	504,108.08	726,061.93	0.74	-357.71	52.94	
8,508.00	10.75	234.71	8,447.88	406.53 S	459.67 W	504,107.87	726,061.63	0.74	-357.90	52.88	
8,510.00	10.76	234.78	8,449.84	406.75 S	459.98 W	504,107.65	726,061.32	0.74	-358.08	52.81	
8,512.00	10.77	234.84	8,451.81	406.96 S	460.28 W	504,107.44	726,061.02	0.74	-358.26	52.75	
8,514.00	10.78	234.90	8,453.77	407.18 S	460.59 W	504,107.22	726,060.71	0.74	-358.45	52.69	
8,516.00	10.79	234.97	8,455.74	407.39 S	460.90 W	504,107.01	726,060.40	0.74	-358.63	52.63	
8,518.00	10.80	235.03	8,457.70	407.61 S	461.20 W	504,106.79	726,060.10	0.74	-358.81	52.56	
8,520.00	10.81	235.09	8,459.67	407.82 S	461.51 W	504,106.58	726,059.79	0.74	-358.99	52.50	
8,522.00	10.81	235.16	8,461.63	408.04 S	461.82 W	504,106.36	726,059.48	0.74	-359.18	52.44	
8,524.00	10.82	235.22	8,463.60	408.25 S	462.13 W	504,106.15	726,059.17	0.74	-359.36	52.38	
8,526.00	10.83	235.28	8,465.56	408.47 S	462.43 W	504,105.93	726,058.87	0.74	-359.54	52.32	
8,528.00	10.84	235.35	8,467.52	408.68 S	462.74 W	504,105.72	726,058.56	0.74	-359.72	52.26	
8,530.00	10.85	235.41	8,469.49	408.89 S	463.05 W	504,105.51	726,058.25	0.74	-359.90	52.19	
8,532.00	10.86	235.47	8,471.45	409.11 S	463.36 W	504,105.29	726,057.94	0.74	-360.08	52.13	
8,534.00	10.84	235.48	8,473.42	409.32 S	463.67 W	504,105.08	726,057.63	1.04	-360.26	175.50	
8,536.00	10.82	235.49	8,475.38	409.53 S	463.98 W	504,104.87	726,057.32	1.04	-360.44	175.49	
8,538.00	10.80	235.50	8,477.35	409.75 S	464.29 W	504,104.65	726,057.01	1.04	-360.62	175.48	
8,540.00	10.78	235.50	8,479.31	409.96 S	464.60 W	504,104.44	726,056.70	1.04	-360.80	175.47	
8,542.00	10.76	235.51	8,481.28	410.17 S	464.91 W	504,104.23	726,056.39	1.04	-360.98	175.46	
8,544.00	10.74	235.52	8,483.24	410.38 S	465.22 W	504,104.02	726,056.08	1.04	-361.16	175.45	
8,546.00	10.72	235.53	8,485.21	410.59 S	465.52 W	504,103.81	726,055.78	1.04	-361.34	175.44	
8,548.00	10.69	235.54	8,487.17	410.80 S	465.83 W	504,103.60	726,055.47	1.04	-361.52	175.44	
8,550.00	10.67	235.55	8,489.14	411.01 S	466.13 W	504,103.39	726,055.17	1.04	-361.70	175.43	
8,552.00	10.65	235.56	8,491.10	411.22 S	466.44 W	504,103.18	726,054.86	1.04	-361.87	175.42	
8,554.00	10.63	235.57	8,493.07	411.43 S	466.74 W	504,102.97	726,054.56	1.04	-362.05	175.41	
8,556.00	10.61	235.58	8,495.03	411.64 S	467.05 W	504,102.76	726,054.25	1.04	-362.23	175.40	
8,558.00	10.59	235.58	8,497.00	411.85 S	467.35 W	504,102.55	726,053.95	1.04	-362.40	175.39	
8,560.00	10.57	235.59	8,498.96	412.05 S	467.66 W	504,102.35	726,053.64	1.04	-362.58	175.38	
8,562.00	10.55	235.60	8,500.93	412.26 S	467.96 W	504,102.14	726,053.34	1.04	-362.76	175.37	
8,564.00	10.53	235.61	8,502.90	412.47 S	468.26 W	504,101.93	726,053.04	1.04	-362.93	175.37	
8,566.00	10.51	235.62	8,504.86	412.67 S	468.56 W	504,101.73	726,052.74	1.04	-363.11	175.36	
8,568.00	10.49	235.63	8,506.83	412.88 S	468.86 W	504,101.52	726,052.44	1.04	-363.28	175.35	
8,570.00	10.47	235.64	8,508.80	413.09 S	469.16 W	504,101.31	726,052.14	1.04	-363.45	175.34	
8,572.00	10.45	235.65	8,510.76	413.29 S	469.46 W	504,101.11	726,051.84	1.04	-363.63	175.33	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
8,574.00	10.43	235.66	8,512.73	413.50 S	469.76 W	504,100.90	726,051.54	1.04	-363.80	175.32	
8,576.00	10.41	235.67	8,514.70	413.70 S	470.06 W	504,100.70	726,051.24	1.04	-363.97	175.31	
8,578.00	10.39	235.68	8,516.66	413.90 S	470.36 W	504,100.50	726,050.94	1.04	-364.14	175.30	
8,580.00	10.36	235.69	8,518.63	414.11 S	470.65 W	504,100.29	726,050.65	1.04	-364.32	175.29	
8,582.00	10.34	235.70	8,520.60	414.31 S	470.95 W	504,100.09	726,050.35	1.04	-364.49	175.28	
8,584.00	10.32	235.71	8,522.57	414.51 S	471.25 W	504,099.89	726,050.05	1.04	-364.66	175.27	
8,586.00	10.30	235.72	8,524.53	414.71 S	471.54 W	504,099.69	726,049.76	1.04	-364.83	175.26	
8,588.00	10.28	235.72	8,526.50	414.91 S	471.84 W	504,099.49	726,049.46	1.04	-365.00	175.25	
8,590.00	10.26	235.73	8,528.47	415.11 S	472.13 W	504,099.29	726,049.17	1.04	-365.17	175.25	
8,592.00	10.24	235.74	8,530.44	415.31 S	472.43 W	504,099.09	726,048.87	1.04	-365.34	175.24	
8,594.00	10.22	235.75	8,532.41	415.51 S	472.72 W	504,098.89	726,048.58	1.04	-365.51	175.23	
8,596.00	10.20	235.76	8,534.37	415.71 S	473.01 W	504,098.69	726,048.29	1.04	-365.68	175.22	
8,598.00	10.18	235.77	8,536.34	415.91 S	473.31 W	504,098.49	726,047.99	1.04	-365.85	175.21	
8,600.00	10.16	235.78	8,538.31	416.11 S	473.60 W	504,098.29	726,047.70	1.04	-366.01	175.20	
8,602.00	10.14	235.79	8,540.28	416.31 S	473.89 W	504,098.09	726,047.41	1.04	-366.18	175.19	
8,604.00	10.12	235.80	8,542.25	416.51 S	474.18 W	504,097.89	726,047.12	1.04	-366.35	175.18	
8,606.00	10.10	235.81	8,544.22	416.70 S	474.47 W	504,097.70	726,046.83	1.04	-366.52	175.17	
8,608.00	10.08	235.82	8,546.19	416.90 S	474.76 W	504,097.50	726,046.54	1.04	-366.68	175.16	
8,610.00	10.06	235.83	8,548.16	417.10 S	475.05 W	504,097.30	726,046.25	1.04	-366.85	175.15	
8,612.00	10.03	235.84	8,550.13	417.29 S	475.34 W	504,097.11	726,045.96	1.04	-367.01	175.14	
8,614.00	10.01	235.85	8,552.10	417.49 S	475.63 W	504,096.91	726,045.67	1.04	-367.18	175.13	
8,616.00	9.99	235.86	8,554.06	417.68 S	475.92 W	504,096.72	726,045.38	1.04	-367.34	175.12	
8,618.00	9.97	235.87	8,556.03	417.88 S	476.20 W	504,096.52	726,045.10	1.04	-367.51	175.11	
8,620.00	9.95	235.88	8,558.00	418.07 S	476.49 W	504,096.33	726,044.81	1.04	-367.67	175.10	
8,622.00	9.93	235.89	8,559.97	418.27 S	476.77 W	504,096.13	726,044.53	1.04	-367.84	175.09	
8,624.00	9.91	235.90	8,561.94	418.46 S	477.06 W	504,095.94	726,044.24	1.04	-368.00	175.08	
8,626.00	9.89	235.91	8,563.91	418.65 S	477.34 W	504,095.75	726,043.96	1.04	-368.16	175.07	
8,628.00	9.88	235.92	8,565.88	418.84 S	477.63 W	504,095.56	726,043.67	0.52	-368.32	175.06	
8,630.00	9.88	235.87	8,567.86	419.04 S	477.91 W	504,095.36	726,043.39	0.47	-368.49	-85.01	
8,632.00	9.88	235.83	8,569.83	419.23 S	478.20 W	504,095.17	726,043.10	0.31	-368.65	-84.96	
8,634.00	9.88	235.79	8,571.80	419.42 S	478.48 W	504,094.98	726,042.82	0.31	-368.81	-84.92	
8,636.00	9.88	235.76	8,573.77	419.62 S	478.76 W	504,094.78	726,042.54	0.31	-368.98	-84.89	
8,638.00	9.88	235.72	8,575.74	419.81 S	479.05 W	504,094.59	726,042.25	0.31	-369.14	-84.85	
8,640.00	9.88	235.69	8,577.71	420.00 S	479.33 W	504,094.40	726,041.97	0.31	-369.30	-84.82	
8,642.00	9.88	235.65	8,579.68	420.20 S	479.62 W	504,094.20	726,041.68	0.31	-369.47	-84.78	
8,644.00	9.88	235.61	8,581.65	420.39 S	479.90 W	504,094.01	726,041.40	0.31	-369.63	-84.75	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
8,646.00	9.89	235.58	8,583.62	420.58 S	480.18 W	504,093.82	726,041.12	0.31	-369.80	-84.71	
8,648.00	9.89	235.54	8,585.59	420.78 S	480.47 W	504,093.62	726,040.83	0.31	-369.96	-84.68	
8,650.00	9.89	235.51	8,587.56	420.97 S	480.75 W	504,093.43	726,040.55	0.31	-370.13	-84.64	
8,652.00	9.89	235.47	8,589.53	421.17 S	481.03 W	504,093.23	726,040.27	0.31	-370.29	-84.60	
8,654.00	9.89	235.43	8,591.50	421.36 S	481.31 W	504,093.04	726,039.99	0.31	-370.46	-84.57	
8,656.00	9.89	235.40	8,593.47	421.56 S	481.60 W	504,092.84	726,039.70	0.31	-370.62	-84.53	
8,658.00	9.89	235.36	8,595.44	421.75 S	481.88 W	504,092.65	726,039.42	0.31	-370.79	-84.50	
8,660.00	9.89	235.32	8,597.41	421.95 S	482.16 W	504,092.45	726,039.14	0.31	-370.95	-84.46	
8,662.00	9.89	235.29	8,599.38	422.14 S	482.44 W	504,092.26	726,038.86	0.31	-371.12	-84.43	
8,664.00	9.89	235.25	8,601.35	422.34 S	482.73 W	504,092.06	726,038.57	0.31	-371.28	-84.39	
8,666.00	9.89	235.22	8,603.32	422.53 S	483.01 W	504,091.87	726,038.29	0.31	-371.45	-84.36	
8,668.00	9.89	235.18	8,605.29	422.73 S	483.29 W	504,091.67	726,038.01	0.31	-371.62	-84.32	
8,670.00	9.89	235.14	8,607.26	422.93 S	483.57 W	504,091.47	726,037.73	0.31	-371.78	-84.29	
8,672.00	9.89	235.11	8,609.23	423.12 S	483.86 W	504,091.28	726,037.44	0.31	-371.95	-84.25	
8,674.00	9.89	235.07	8,611.20	423.32 S	484.14 W	504,091.08	726,037.16	0.31	-372.12	-84.21	
8,676.00	9.89	235.04	8,613.17	423.52 S	484.42 W	504,090.88	726,036.88	0.31	-372.29	-84.18	
8,678.00	9.90	235.00	8,615.14	423.71 S	484.70 W	504,090.69	726,036.60	0.31	-372.45	-84.14	
8,680.00	9.90	234.96	8,617.11	423.91 S	484.98 W	504,090.49	726,036.32	0.31	-372.62	-84.11	
8,682.00	9.90	234.93	8,619.08	424.11 S	485.26 W	504,090.29	726,036.04	0.31	-372.79	-84.07	
8,684.00	9.90	234.89	8,621.05	424.31 S	485.54 W	504,090.09	726,035.76	0.31	-372.96	-84.04	
8,686.00	9.90	234.86	8,623.02	424.50 S	485.83 W	504,089.90	726,035.47	0.31	-373.12	-84.00	
8,688.00	9.90	234.82	8,624.99	424.70 S	486.11 W	504,089.70	726,035.19	0.31	-373.29	-83.97	
8,690.00	9.90	234.78	8,626.96	424.90 S	486.39 W	504,089.50	726,034.91	0.31	-373.46	-83.93	
8,692.00	9.90	234.75	8,628.93	425.10 S	486.67 W	504,089.30	726,034.63	0.31	-373.63	-83.90	
8,694.00	9.90	234.71	8,630.90	425.30 S	486.95 W	504,089.10	726,034.35	0.31	-373.80	-83.86	
8,696.00	9.90	234.68	8,632.87	425.50 S	487.23 W	504,088.90	726,034.07	0.31	-373.97	-83.82	
8,698.00	9.90	234.64	8,634.84	425.69 S	487.51 W	504,088.71	726,033.79	0.31	-374.14	-83.79	
8,700.00	9.90	234.61	8,636.81	425.89 S	487.79 W	504,088.51	726,033.51	0.31	-374.31	-83.75	
8,702.00	9.90	234.57	8,638.78	426.09 S	488.07 W	504,088.31	726,033.23	0.31	-374.48	-83.72	
8,704.00	9.90	234.53	8,640.76	426.29 S	488.35 W	504,088.11	726,032.95	0.31	-374.65	-83.68	
8,706.00	9.90	234.50	8,642.73	426.49 S	488.63 W	504,087.91	726,032.67	0.31	-374.82	-83.65	
8,708.00	9.91	234.46	8,644.70	426.69 S	488.91 W	504,087.71	726,032.39	0.31	-374.99	-83.61	
8,710.00	9.91	234.43	8,646.67	426.89 S	489.19 W	504,087.51	726,032.11	0.31	-375.16	-83.58	
8,712.00	9.91	234.39	8,648.64	427.09 S	489.47 W	504,087.31	726,031.83	0.31	-375.33	-83.54	
8,714.00	9.91	234.35	8,650.61	427.29 S	489.75 W	504,087.11	726,031.55	0.31	-375.50	-83.51	
8,716.00	9.91	234.32	8,652.58	427.49 S	490.03 W	504,086.91	726,031.27	0.31	-375.67	-83.47	
8,718.00	9.91	234.28	8,654.55	427.69 S	490.31 W	504,086.71	726,030.99	0.31	-375.84	-83.43	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
8,720.00	9.91	234.25	8,656.52	427.90 S	490.59 W	504,086.50	726,030.71	0.31	-376.02	-83.40	
8,722.00	9.91	234.21	8,658.49	428.10 S	490.87 W	504,086.30	726,030.43	0.31	-376.19	-83.36	
8,724.00	9.92	234.12	8,660.46	428.30 S	491.15 W	504,086.10	726,030.15	0.80	-376.36	-69.67	
8,726.00	9.92	234.04	8,662.43	428.50 S	491.43 W	504,085.90	726,029.87	0.80	-376.53	-69.59	
8,728.00	9.93	233.95	8,664.40	428.70 S	491.71 W	504,085.70	726,029.59	0.80	-376.71	-69.50	
8,730.00	9.93	233.86	8,666.37	428.91 S	491.98 W	504,085.49	726,029.32	0.80	-376.88	-69.42	
8,732.00	9.94	233.78	8,668.34	429.11 S	492.26 W	504,085.29	726,029.04	0.80	-377.06	-69.33	
8,734.00	9.94	233.69	8,670.31	429.31 S	492.54 W	504,085.09	726,028.76	0.80	-377.23	-69.25	
8,736.00	9.95	233.60	8,672.28	429.52 S	492.82 W	504,084.88	726,028.48	0.80	-377.41	-69.16	
8,738.00	9.96	233.52	8,674.25	429.72 S	493.10 W	504,084.68	726,028.20	0.80	-377.58	-69.08	
8,740.00	9.96	233.43	8,676.22	429.93 S	493.38 W	504,084.47	726,027.92	0.80	-377.76	-68.99	
8,742.00	9.97	233.34	8,678.19	430.14 S	493.65 W	504,084.26	726,027.65	0.80	-377.94	-68.91	
8,744.00	9.97	233.26	8,680.16	430.34 S	493.93 W	504,084.06	726,027.37	0.80	-378.11	-68.82	
8,746.00	9.98	233.17	8,682.13	430.55 S	494.21 W	504,083.85	726,027.09	0.80	-378.29	-68.74	
8,748.00	9.98	233.09	8,684.10	430.76 S	494.49 W	504,083.64	726,026.81	0.80	-378.47	-68.65	
8,750.00	9.99	233.00	8,686.07	430.97 S	494.76 W	504,083.43	726,026.54	0.80	-378.65	-68.57	
8,752.00	10.00	232.91	8,688.04	431.18 S	495.04 W	504,083.22	726,026.26	0.80	-378.83	-68.48	
8,754.00	10.00	232.83	8,690.00	431.39 S	495.32 W	504,083.01	726,025.98	0.80	-379.01	-68.40	
8,756.00	10.01	232.74	8,691.97	431.60 S	495.59 W	504,082.80	726,025.71	0.80	-379.19	-68.31	
8,758.00	10.01	232.66	8,693.94	431.81 S	495.87 W	504,082.59	726,025.43	0.80	-379.37	-68.23	
8,760.00	10.02	232.57	8,695.91	432.02 S	496.15 W	504,082.38	726,025.15	0.80	-379.56	-68.14	
8,762.00	10.03	232.49	8,697.88	432.23 S	496.42 W	504,082.17	726,024.88	0.80	-379.74	-68.06	
8,764.00	10.03	232.40	8,699.85	432.44 S	496.70 W	504,081.96	726,024.60	0.80	-379.92	-67.98	
8,766.00	10.04	232.32	8,701.82	432.65 S	496.97 W	504,081.75	726,024.33	0.80	-380.10	-67.89	
8,768.00	10.04	232.23	8,703.79	432.87 S	497.25 W	504,081.53	726,024.05	0.80	-380.29	-67.81	
8,770.00	10.05	232.15	8,705.76	433.08 S	497.53 W	504,081.32	726,023.77	0.80	-380.47	-67.73	
8,772.00	10.06	232.06	8,707.73	433.30 S	497.80 W	504,081.10	726,023.50	0.80	-380.66	-67.64	
8,774.00	10.06	231.98	8,709.70	433.51 S	498.08 W	504,080.89	726,023.22	0.80	-380.85	-67.56	
8,776.00	10.07	231.89	8,711.67	433.73 S	498.35 W	504,080.67	726,022.95	0.80	-381.03	-67.48	
8,778.00	10.07	231.81	8,713.64	433.94 S	498.63 W	504,080.46	726,022.67	0.80	-381.22	-67.39	
8,780.00	10.08	231.72	8,715.61	434.16 S	498.90 W	504,080.24	726,022.40	0.80	-381.41	-67.31	
8,782.00	10.09	231.64	8,717.58	434.38 S	499.18 W	504,080.02	726,022.12	0.80	-381.59	-67.23	
8,784.00	10.09	231.56	8,719.54	434.59 S	499.45 W	504,079.81	726,021.85	0.80	-381.78	-67.14	
8,786.00	10.10	231.47	8,721.51	434.81 S	499.73 W	504,079.59	726,021.57	0.80	-381.97	-67.06	
8,788.00	10.11	231.39	8,723.48	435.03 S	500.00 W	504,079.37	726,021.30	0.80	-382.16	-66.98	
8,790.00	10.11	231.30	8,725.45	435.25 S	500.27 W	504,079.15	726,021.03	0.80	-382.35	-66.89	
8,792.00	10.12	231.22	8,727.42	435.47 S	500.55 W	504,078.93	726,020.75	0.80	-382.54	-66.81	



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Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
8,794.00	10.12	231.14	8,729.39	435.69 S	500.82 W	504,078.71	726,020.48	0.80	-382.74	-66.73	
8,796.00	10.13	231.05	8,731.36	435.91 S	501.10 W	504,078.49	726,020.20	0.80	-382.93	-66.65	
8,798.00	10.14	230.97	8,733.33	436.13 S	501.37 W	504,078.27	726,019.93	0.80	-383.12	-66.57	
8,800.00	10.14	230.89	8,735.30	436.35 S	501.64 W	504,078.05	726,019.66	0.80	-383.31	-66.48	
8,802.00	10.15	230.80	8,737.26	436.58 S	501.92 W	504,077.82	726,019.38	0.80	-383.51	-66.40	
8,804.00	10.16	230.72	8,739.23	436.80 S	502.19 W	504,077.60	726,019.11	0.80	-383.70	-66.32	
8,806.00	10.16	230.64	8,741.20	437.02 S	502.46 W	504,077.38	726,018.84	0.80	-383.90	-66.24	
8,808.00	10.17	230.55	8,743.17	437.25 S	502.73 W	504,077.15	726,018.57	0.80	-384.09	-66.16	
8,810.00	10.18	230.47	8,745.14	437.47 S	503.01 W	504,076.93	726,018.29	0.80	-384.29	-66.07	
8,812.00	10.18	230.39	8,747.11	437.70 S	503.28 W	504,076.70	726,018.02	0.80	-384.48	-65.99	
8,814.00	10.19	230.31	8,749.08	437.92 S	503.55 W	504,076.48	726,017.75	0.80	-384.68	-65.91	
8,816.00	10.20	230.22	8,751.04	438.15 S	503.82 W	504,076.25	726,017.48	0.80	-384.88	-65.83	
8,818.00	10.20	230.14	8,753.01	438.38 S	504.10 W	504,076.02	726,017.20	0.80	-385.08	-65.75	
8,820.00	10.21	230.06	8,754.98	438.60 S	504.37 W	504,075.80	726,016.93	0.80	-385.27	-65.67	
8,822.00	10.22	229.98	8,756.95	438.83 S	504.64 W	504,075.57	726,016.66	0.80	-385.47	-65.59	
8,824.00	10.22	229.89	8,758.92	439.06 S	504.91 W	504,075.34	726,016.39	0.80	-385.67	-65.51	
8,826.00	10.23	229.81	8,760.89	439.29 S	505.18 W	504,075.11	726,016.12	0.80	-385.87	-65.43	
8,828.00	10.24	229.73	8,762.85	439.52 S	505.45 W	504,074.88	726,015.85	0.80	-386.07	-65.35	
8,830.00	10.24	229.65	8,764.82	439.75 S	505.72 W	504,074.65	726,015.58	0.80	-386.28	-65.26	
8,832.00	10.25	229.57	8,766.79	439.98 S	506.00 W	504,074.42	726,015.30	0.80	-386.48	-65.18	
8,834.00	10.26	229.49	8,768.76	440.21 S	506.27 W	504,074.19	726,015.03	0.80	-386.68	-65.10	
8,836.00	10.26	229.40	8,770.73	440.44 S	506.54 W	504,073.96	726,014.76	0.80	-386.88	-65.02	
8,838.00	10.27	229.32	8,772.69	440.67 S	506.81 W	504,073.73	726,014.49	0.80	-387.09	-64.94	
8,840.00	10.28	229.24	8,774.66	440.91 S	507.08 W	504,073.49	726,014.22	0.80	-387.29	-64.86	
8,842.00	10.28	229.16	8,776.63	441.14 S	507.35 W	504,073.26	726,013.95	0.80	-387.50	-64.78	
8,844.00	10.29	229.08	8,778.60	441.37 S	507.62 W	504,073.03	726,013.68	0.80	-387.70	-64.70	
8,846.00	10.30	229.00	8,780.57	441.61 S	507.89 W	504,072.79	726,013.41	0.80	-387.91	-64.62	
8,848.00	10.30	228.92	8,782.53	441.84 S	508.16 W	504,072.56	726,013.14	0.80	-388.11	-64.54	
8,850.00	10.31	228.84	8,784.50	442.08 S	508.43 W	504,072.32	726,012.87	0.80	-388.32	-64.47	
8,852.00	10.32	228.76	8,786.47	442.31 S	508.70 W	504,072.09	726,012.60	0.80	-388.53	-64.39	
8,854.00	10.32	228.68	8,788.44	442.55 S	508.97 W	504,071.85	726,012.33	0.80	-388.73	-64.31	
8,856.00	10.33	228.60	8,790.40	442.79 S	509.23 W	504,071.61	726,012.07	0.80	-388.94	-64.23	
8,858.00	10.34	228.52	8,792.37	443.02 S	509.50 W	504,071.38	726,011.80	0.80	-389.15	-64.15	
8,860.00	10.34	228.44	8,794.34	443.26 S	509.77 W	504,071.14	726,011.53	0.80	-389.36	-64.07	
8,862.00	10.35	228.36	8,796.31	443.50 S	510.04 W	504,070.90	726,011.26	0.80	-389.57	-63.99	
8,864.00	10.36	228.28	8,798.27	443.74 S	510.31 W	504,070.66	726,010.99	0.80	-389.78	-63.91	

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Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
8,866.00	10.37	228.20	8,800.24	443.98 S	510.58 W	504,070.42	726,010.72	0.80	-389.99	-63.83	
8,868.00	10.37	228.12	8,802.21	444.22 S	510.85 W	504,070.18	726,010.45	0.80	-390.21	-63.75	
8,870.00	10.38	228.04	8,804.18	444.46 S	511.11 W	504,069.94	726,010.19	0.80	-390.42	-63.68	
8,872.00	10.39	227.96	8,806.14	444.70 S	511.38 W	504,069.70	726,009.92	0.80	-390.63	-63.60	
8,874.00	10.39	227.88	8,808.11	444.94 S	511.65 W	504,069.46	726,009.65	0.80	-390.84	-63.52	
8,876.00	10.40	227.80	8,810.08	445.19 S	511.92 W	504,069.21	726,009.38	0.80	-391.06	-63.44	
8,878.00	10.41	227.72	8,812.05	445.43 S	512.18 W	504,068.97	726,009.12	0.80	-391.27	-63.36	
8,880.00	10.42	227.64	8,814.01	445.67 S	512.45 W	504,068.73	726,008.85	0.80	-391.49	-63.29	
8,882.00	10.42	227.56	8,815.98	445.92 S	512.72 W	504,068.48	726,008.58	0.80	-391.70	-63.21	
8,884.00	10.43	227.48	8,817.95	446.16 S	512.99 W	504,068.24	726,008.31	0.80	-391.92	-63.13	
8,886.00	10.44	227.40	8,819.91	446.40 S	513.25 W	504,068.00	726,008.05	0.80	-392.14	-63.05	
8,888.00	10.44	227.33	8,821.88	446.65 S	513.52 W	504,067.75	726,007.78	0.80	-392.35	-62.98	
8,890.00	10.45	227.25	8,823.85	446.90 S	513.79 W	504,067.50	726,007.51	0.80	-392.57	-62.90	
8,892.00	10.46	227.17	8,825.81	447.14 S	514.05 W	504,067.26	726,007.25	0.80	-392.79	-62.82	
8,894.00	10.47	227.09	8,827.78	447.39 S	514.32 W	504,067.01	726,006.98	0.80	-393.01	-62.74	
8,896.00	10.47	227.01	8,829.75	447.64 S	514.58 W	504,066.76	726,006.72	0.80	-393.23	-62.67	
8,898.00	10.48	226.93	8,831.71	447.89 S	514.85 W	504,066.51	726,006.45	0.80	-393.45	-62.59	
8,900.00	10.49	226.86	8,833.68	448.13 S	515.12 W	504,066.27	726,006.18	0.80	-393.67	-62.51	
8,902.00	10.50	226.78	8,835.65	448.38 S	515.38 W	504,066.02	726,005.92	0.80	-393.89	-62.44	
8,904.00	10.50	226.70	8,837.61	448.63 S	515.65 W	504,065.77	726,005.65	0.80	-394.11	-62.36	
8,906.00	10.51	226.62	8,839.58	448.88 S	515.91 W	504,065.52	726,005.39	0.80	-394.33	-62.28	
8,908.00	10.52	226.55	8,841.55	449.13 S	516.18 W	504,065.27	726,005.12	0.80	-394.56	-62.21	
8,910.00	10.53	226.47	8,843.51	449.39 S	516.44 W	504,065.01	726,004.86	0.80	-394.78	-62.13	
8,912.00	10.52	226.39	8,845.48	449.64 S	516.71 W	504,064.76	726,004.59	0.76	-395.00	-106.13	
8,914.00	10.51	226.31	8,847.45	449.89 S	516.97 W	504,064.51	726,004.33	1.09	-395.23	-136.64	
8,916.00	10.49	226.22	8,849.41	450.14 S	517.23 W	504,064.26	726,004.07	1.09	-395.45	-136.56	
8,918.00	10.47	226.14	8,851.38	450.39 S	517.50 W	504,064.01	726,003.80	1.09	-395.67	-136.48	
8,920.00	10.46	226.06	8,853.35	450.65 S	517.76 W	504,063.75	726,003.54	1.09	-395.90	-136.40	
8,922.00	10.44	225.97	8,855.31	450.90 S	518.02 W	504,063.50	726,003.28	1.09	-396.12	-136.31	
8,924.00	10.43	225.89	8,857.28	451.15 S	518.28 W	504,063.25	726,003.02	1.09	-396.35	-136.23	
8,926.00	10.41	225.81	8,859.25	451.40 S	518.54 W	504,063.00	726,002.76	1.09	-396.57	-136.15	
8,928.00	10.40	225.72	8,861.21	451.65 S	518.80 W	504,062.75	726,002.50	1.09	-396.80	-136.07	
8,930.00	10.38	225.64	8,863.18	451.91 S	519.06 W	504,062.49	726,002.24	1.09	-397.02	-135.99	
8,932.00	10.36	225.55	8,865.15	452.16 S	519.31 W	504,062.24	726,001.99	1.09	-397.24	-135.90	
8,934.00	10.35	225.47	8,867.12	452.41 S	519.57 W	504,061.99	726,001.73	1.09	-397.47	-135.82	
8,936.00	10.33	225.38	8,869.08	452.66 S	519.83 W	504,061.74	726,001.47	1.09	-397.69	-135.74	
8,938.00	10.32	225.30	8,871.05	452.91 S	520.08 W	504,061.49	726,001.22	1.09	-397.92	-135.65	

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Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
8,940.00	10.30	225.21	8,873.02	453.16 S	520.34 W	504,061.24	726,000.96	1.09	-398.14	-135.57	
8,942.00	10.29	225.13	8,874.99	453.42 S	520.59 W	504,060.98	726,000.71	1.09	-398.37	-135.48	
8,944.00	10.27	225.04	8,876.95	453.67 S	520.84 W	504,060.73	726,000.46	1.09	-398.59	-135.40	
8,946.00	10.25	224.96	8,878.92	453.92 S	521.09 W	504,060.48	726,000.21	1.09	-398.82	-135.31	
8,948.00	10.24	224.87	8,880.89	454.17 S	521.34 W	504,060.23	725,999.96	1.09	-399.04	-135.23	
8,950.00	10.22	224.78	8,882.86	454.42 S	521.59 W	504,059.98	725,999.71	1.09	-399.27	-135.14	
8,952.00	10.21	224.69	8,884.83	454.68 S	521.84 W	504,059.72	725,999.46	1.09	-399.50	-135.06	
8,954.00	10.19	224.61	8,886.79	454.93 S	522.09 W	504,059.47	725,999.21	1.09	-399.72	-134.97	
8,956.00	10.18	224.52	8,888.76	455.18 S	522.34 W	504,059.22	725,998.96	1.09	-399.95	-134.89	
8,958.00	10.16	224.43	8,890.73	455.43 S	522.59 W	504,058.97	725,998.71	1.09	-400.17	-134.80	
8,960.00	10.15	224.34	8,892.70	455.68 S	522.84 W	504,058.72	725,998.46	1.09	-400.40	-134.71	
8,962.00	10.13	224.25	8,894.67	455.94 S	523.08 W	504,058.46	725,998.22	1.09	-400.62	-134.63	
8,964.00	10.12	224.17	8,896.64	456.19 S	523.33 W	504,058.21	725,997.97	1.09	-400.85	-134.54	
8,966.00	10.10	224.08	8,898.61	456.44 S	523.57 W	504,057.96	725,997.73	1.09	-401.08	-134.45	
8,968.00	10.09	223.99	8,900.58	456.69 S	523.81 W	504,057.71	725,997.49	1.09	-401.30	-134.37	
8,970.00	10.07	223.90	8,902.55	456.94 S	524.06 W	504,057.46	725,997.24	1.09	-401.53	-134.28	
8,972.00	10.06	223.81	8,904.51	457.20 S	524.30 W	504,057.20	725,997.00	1.09	-401.75	-134.19	
8,974.00	10.04	223.72	8,906.48	457.45 S	524.54 W	504,056.95	725,996.76	1.09	-401.98	-134.10	
8,976.00	10.02	223.63	8,908.45	457.70 S	524.78 W	504,056.70	725,996.52	1.09	-402.21	-134.01	
8,978.00	10.01	223.54	8,910.42	457.95 S	525.02 W	504,056.45	725,996.28	1.09	-402.43	-133.92	
8,980.00	9.99	223.45	8,912.39	458.20 S	525.26 W	504,056.20	725,996.04	1.09	-402.66	-133.83	
8,982.00	9.98	223.36	8,914.36	458.46 S	525.50 W	504,055.94	725,995.80	1.09	-402.89	-133.74	
8,984.00	9.96	223.26	8,916.33	458.71 S	525.74 W	504,055.69	725,995.56	1.09	-403.11	-133.65	
8,986.00	9.95	223.17	8,918.30	458.96 S	525.97 W	504,055.44	725,995.33	1.09	-403.34	-133.56	
8,988.00	9.93	223.08	8,920.27	459.21 S	526.21 W	504,055.19	725,995.09	1.09	-403.57	-133.47	
8,990.00	9.92	222.99	8,922.24	459.46 S	526.44 W	504,054.94	725,994.86	1.09	-403.79	-133.38	
8,992.00	9.90	222.90	8,924.21	459.72 S	526.68 W	504,054.68	725,994.62	1.09	-404.02	-133.29	
8,994.00	9.89	222.80	8,926.18	459.97 S	526.91 W	504,054.43	725,994.39	1.09	-404.25	-133.20	
8,996.00	9.87	222.71	8,928.15	460.22 S	527.15 W	504,054.18	725,994.15	1.09	-404.47	-133.11	
8,998.00	9.86	222.62	8,930.12	460.47 S	527.38 W	504,053.93	725,993.92	1.09	-404.70	-133.02	
9,000.00	9.84	222.52	8,932.09	460.72 S	527.61 W	504,053.68	725,993.69	1.09	-404.93	-132.93	
9,002.00	9.83	222.43	8,934.06	460.98 S	527.84 W	504,053.42	725,993.46	1.09	-405.16	-132.83	
9,004.00	9.81	222.33	8,936.03	461.23 S	528.07 W	504,053.17	725,993.23	1.09	-405.38	-132.74	
9,006.00	9.80	222.24	8,938.01	461.48 S	528.30 W	504,052.92	725,993.00	1.09	-405.61	-132.65	
9,008.00	9.80	222.28	8,939.98	461.73 S	528.53 W	504,052.67	725,992.77	0.39	-405.84	106.67	
9,010.00	9.80	222.33	8,941.95	461.98 S	528.76 W	504,052.42	725,992.54	0.39	-406.07	106.63	
9,012.00	9.79	222.37	8,943.92	462.24 S	528.99 W	504,052.16	725,992.31	0.39	-406.29	106.59	

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				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
9,014.00	9.79	222.42	8,945.89	462.49 S	529.22 W	504,051.91	725,992.08	0.39	-406.52	106.54	
9,016.00	9.79	222.46	8,947.86	462.74 S	529.45 W	504,051.66	725,991.85	0.39	-406.75	106.50	
9,018.00	9.79	222.50	8,949.83	462.99 S	529.68 W	504,051.41	725,991.62	0.39	-406.97	106.46	
9,020.00	9.78	222.55	8,951.80	463.24 S	529.90 W	504,051.16	725,991.40	0.39	-407.20	106.41	
9,022.00	9.78	222.59	8,953.77	463.49 S	530.13 W	504,050.91	725,991.17	0.39	-407.42	106.37	
9,024.00	9.78	222.64	8,955.74	463.74 S	530.36 W	504,050.66	725,990.94	0.39	-407.65	106.33	
9,026.00	9.78	222.68	8,957.71	463.99 S	530.60 W	504,050.41	725,990.70	0.39	-407.87	106.28	
9,028.00	9.78	222.72	8,959.69	464.24 S	530.83 W	504,050.16	725,990.47	0.39	-408.10	106.24	
9,030.00	9.77	222.77	8,961.66	464.49 S	531.06 W	504,049.91	725,990.24	0.39	-408.32	106.19	
9,032.00	9.77	222.81	8,963.63	464.74 S	531.29 W	504,049.66	725,990.01	0.39	-408.55	106.15	
9,034.00	9.77	222.86	8,965.60	464.99 S	531.52 W	504,049.41	725,989.78	0.39	-408.77	106.11	
9,036.00	9.77	222.90	8,967.57	465.24 S	531.75 W	504,049.16	725,989.55	0.39	-409.00	106.06	
9,038.00	9.76	222.95	8,969.54	465.48 S	531.98 W	504,048.92	725,989.32	0.39	-409.22	106.02	
9,040.00	9.76	222.99	8,971.51	465.73 S	532.21 W	504,048.67	725,989.09	0.39	-409.44	105.98	
9,042.00	9.76	223.03	8,973.48	465.98 S	532.44 W	504,048.42	725,988.86	0.39	-409.67	105.93	
9,044.00	9.76	223.08	8,975.45	466.23 S	532.67 W	504,048.17	725,988.63	0.39	-409.89	105.89	
9,046.00	9.76	223.12	8,977.42	466.47 S	532.90 W	504,047.93	725,988.40	0.39	-410.11	105.85	
9,048.00	9.75	223.17	8,979.40	466.72 S	533.14 W	504,047.68	725,988.16	0.39	-410.34	105.80	
9,050.00	9.75	223.21	8,981.37	466.97 S	533.37 W	504,047.43	725,987.93	0.39	-410.56	105.76	
9,052.00	9.75	223.26	8,983.34	467.22 S	533.60 W	504,047.18	725,987.70	0.39	-410.78	105.71	
9,054.00	9.75	223.30	8,985.31	467.46 S	533.83 W	504,046.94	725,987.47	0.39	-411.00	105.67	
9,056.00	9.75	223.35	8,987.28	467.71 S	534.06 W	504,046.69	725,987.24	0.39	-411.22	105.63	
9,058.00	9.74	223.39	8,989.25	467.95 S	534.30 W	504,046.45	725,987.00	0.39	-411.44	105.58	
9,060.00	9.74	223.43	8,991.22	468.20 S	534.53 W	504,046.20	725,986.77	0.39	-411.67	105.54	
9,062.00	9.74	223.48	8,993.19	468.45 S	534.76 W	504,045.95	725,986.54	0.39	-411.89	105.50	
9,064.00	9.74	223.52	8,995.16	468.69 S	535.00 W	504,045.71	725,986.30	0.39	-412.11	105.45	
9,066.00	9.74	223.57	8,997.14	468.94 S	535.23 W	504,045.46	725,986.07	0.39	-412.33	105.41	
9,068.00	9.73	223.61	8,999.11	469.18 S	535.46 W	504,045.22	725,985.84	0.39	-412.55	105.36	
9,070.00	9.73	223.66	9,001.08	469.43 S	535.70 W	504,044.97	725,985.60	0.39	-412.77	105.32	
9,072.00	9.73	223.70	9,003.05	469.67 S	535.93 W	504,044.73	725,985.37	0.39	-412.99	105.28	
9,074.00	9.73	223.75	9,005.02	469.92 S	536.16 W	504,044.48	725,985.14	0.39	-413.21	105.23	
9,076.00	9.73	223.79	9,006.99	470.16 S	536.40 W	504,044.24	725,984.90	0.39	-413.42	105.19	
9,078.00	9.72	223.84	9,008.96	470.40 S	536.63 W	504,044.00	725,984.67	0.39	-413.64	105.14	
9,080.00	9.72	223.88	9,010.93	470.65 S	536.86 W	504,043.75	725,984.44	0.39	-413.86	105.10	
9,082.00	9.72	223.92	9,012.91	470.89 S	537.10 W	504,043.51	725,984.20	0.39	-414.08	105.06	
9,084.00	9.72	223.97	9,014.88	471.13 S	537.33 W	504,043.27	725,983.97	0.39	-414.30	105.01	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
9,086.00	9.71	224.01	9,016.85	471.38 S	537.57 W	504,043.02	725,983.73	0.39	-414.52	104.97	
9,088.00	9.71	224.06	9,018.82	471.62 S	537.80 W	504,042.78	725,983.50	0.39	-414.73	104.92	
9,090.00	9.71	224.10	9,020.79	471.86 S	538.04 W	504,042.54	725,983.26	0.39	-414.95	104.88	
9,092.00	9.71	224.15	9,022.76	472.10 S	538.27 W	504,042.30	725,983.03	0.39	-415.17	104.84	
9,094.00	9.71	224.19	9,024.73	472.34 S	538.51 W	504,042.06	725,982.79	0.39	-415.39	104.79	
9,096.00	9.70	224.24	9,026.71	472.59 S	538.74 W	504,041.81	725,982.56	0.39	-415.60	104.75	
9,098.00	9.70	224.28	9,028.68	472.83 S	538.98 W	504,041.57	725,982.32	0.39	-415.82	104.70	
9,100.00	9.70	224.33	9,030.65	473.07 S	539.21 W	504,041.33	725,982.09	0.39	-416.03	104.66	
9,102.00	9.70	224.40	9,032.62	473.31 S	539.45 W	504,041.09	725,981.85	0.57	-416.25	88.35	
9,104.00	9.70	224.49	9,034.59	473.55 S	539.68 W	504,040.85	725,981.62	0.78	-416.47	80.18	
9,106.00	9.71	224.58	9,036.56	473.79 S	539.92 W	504,040.61	725,981.38	0.78	-416.68	80.09	
9,108.00	9.71	224.67	9,038.53	474.03 S	540.16 W	504,040.37	725,981.14	0.78	-416.90	80.00	
9,110.00	9.71	224.76	9,040.50	474.27 S	540.39 W	504,040.13	725,980.91	0.78	-417.11	79.91	
9,112.00	9.71	224.85	9,042.48	474.51 S	540.63 W	504,039.89	725,980.67	0.78	-417.32	79.83	
9,114.00	9.72	224.94	9,044.45	474.75 S	540.87 W	504,039.65	725,980.43	0.78	-417.54	79.74	
9,116.00	9.72	225.03	9,046.42	474.99 S	541.11 W	504,039.41	725,980.19	0.78	-417.75	79.65	
9,118.00	9.72	225.12	9,048.39	475.23 S	541.35 W	504,039.17	725,979.95	0.78	-417.96	79.56	
9,120.00	9.73	225.21	9,050.36	475.46 S	541.59 W	504,038.94	725,979.71	0.78	-418.18	79.47	
9,122.00	9.73	225.30	9,052.33	475.70 S	541.83 W	504,038.70	725,979.47	0.78	-418.39	79.38	
9,124.00	9.73	225.39	9,054.30	475.94 S	542.07 W	504,038.46	725,979.23	0.78	-418.60	79.29	
9,126.00	9.73	225.48	9,056.28	476.18 S	542.31 W	504,038.22	725,978.99	0.78	-418.81	79.20	
9,128.00	9.74	225.57	9,058.25	476.41 S	542.55 W	504,037.99	725,978.75	0.78	-419.02	79.11	
9,130.00	9.74	225.66	9,060.22	476.65 S	542.79 W	504,037.75	725,978.51	0.78	-419.24	79.02	
9,132.00	9.74	225.75	9,062.19	476.89 S	543.03 W	504,037.51	725,978.27	0.78	-419.45	78.93	
9,134.00	9.75	225.84	9,064.16	477.12 S	543.28 W	504,037.28	725,978.02	0.78	-419.66	78.85	
9,136.00	9.75	225.93	9,066.13	477.36 S	543.52 W	504,037.04	725,977.78	0.78	-419.87	78.76	
9,138.00	9.75	226.02	9,068.10	477.59 S	543.76 W	504,036.81	725,977.54	0.78	-420.08	78.67	
9,140.00	9.76	226.11	9,070.07	477.83 S	544.01 W	504,036.57	725,977.29	0.78	-420.28	78.58	
9,142.00	9.76	226.20	9,072.04	478.06 S	544.25 W	504,036.34	725,977.05	0.78	-420.49	78.49	
9,144.00	9.76	226.29	9,074.02	478.30 S	544.50 W	504,036.10	725,976.80	0.78	-420.70	78.40	
9,146.00	9.77	226.38	9,075.99	478.53 S	544.74 W	504,035.87	725,976.56	0.78	-420.91	78.31	
9,148.00	9.77	226.47	9,077.96	478.77 S	544.99 W	504,035.63	725,976.31	0.78	-421.12	78.23	
9,150.00	9.77	226.56	9,079.93	479.00 S	545.23 W	504,035.40	725,976.07	0.78	-421.33	78.14	
9,152.00	9.77	226.65	9,081.90	479.23 S	545.48 W	504,035.17	725,975.82	0.78	-421.53	78.05	
9,154.00	9.78	226.74	9,083.87	479.47 S	545.73 W	504,034.93	725,975.57	0.78	-421.74	77.96	
9,156.00	9.78	226.83	9,085.84	479.70 S	545.98 W	504,034.70	725,975.32	0.78	-421.95	77.87	
9,158.00	9.78	226.92	9,087.81	479.93 S	546.22 W	504,034.47	725,975.08	0.78	-422.15	77.78	



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Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
9,160.00	9.79	227.01	9,089.78	480.16 S	546.47 W	504,034.24	725,974.83	0.78	-422.36	77.70	
9,162.00	9.79	227.10	9,091.75	480.40 S	546.72 W	504,034.00	725,974.58	0.78	-422.56	77.61	
9,164.00	9.79	227.19	9,093.72	480.63 S	546.97 W	504,033.77	725,974.33	0.78	-422.77	77.52	
9,166.00	9.80	227.28	9,095.70	480.86 S	547.22 W	504,033.54	725,974.08	0.78	-422.97	77.43	
9,168.00	9.80	227.36	9,097.67	481.09 S	547.47 W	504,033.31	725,973.83	0.78	-423.18	77.34	
9,170.00	9.81	227.45	9,099.64	481.32 S	547.72 W	504,033.08	725,973.58	0.78	-423.38	77.26	
9,172.00	9.81	227.54	9,101.61	481.55 S	547.97 W	504,032.85	725,973.33	0.78	-423.58	77.17	
9,174.00	9.81	227.63	9,103.58	481.78 S	548.22 W	504,032.62	725,973.08	0.78	-423.79	77.08	
9,176.00	9.82	227.72	9,105.55	482.01 S	548.48 W	504,032.39	725,972.82	0.78	-423.99	76.99	
9,178.00	9.82	227.81	9,107.52	482.24 S	548.73 W	504,032.16	725,972.57	0.78	-424.19	76.91	
9,180.00	9.82	227.90	9,109.49	482.47 S	548.98 W	504,031.93	725,972.32	0.78	-424.39	76.82	
9,182.00	9.83	227.99	9,111.46	482.70 S	549.23 W	504,031.70	725,972.07	0.78	-424.60	76.73	
9,184.00	9.83	228.07	9,113.43	482.92 S	549.49 W	504,031.48	725,971.81	0.78	-424.80	76.64	
9,186.00	9.83	228.16	9,115.40	483.15 S	549.74 W	504,031.25	725,971.56	0.78	-425.00	76.56	
9,188.00	9.84	228.25	9,117.37	483.38 S	550.00 W	504,031.02	725,971.30	0.78	-425.20	76.47	
9,190.00	9.84	228.34	9,119.34	483.61 S	550.25 W	504,030.79	725,971.05	0.78	-425.40	76.38	
9,192.00	9.84	228.43	9,121.31	483.83 S	550.51 W	504,030.57	725,970.79	0.78	-425.60	76.30	
9,194.00	9.85	228.52	9,123.28	484.06 S	550.76 W	504,030.34	725,970.54	0.78	-425.80	76.21	
9,196.00	9.85	228.56	9,125.26	484.29 S	551.02 W	504,030.11	725,970.28	0.39	-426.00	76.12	
9,198.00	9.84	228.63	9,127.23	484.51 S	551.28 W	504,029.89	725,970.02	0.69	-426.20	112.55	
9,200.00	9.84	228.68	9,129.20	484.74 S	551.53 W	504,029.66	725,969.77	0.46	-426.40	112.48	
9,202.00	9.84	228.73	9,131.17	484.96 S	551.79 W	504,029.44	725,969.51	0.46	-426.59	112.43	
9,204.00	9.83	228.78	9,133.14	485.19 S	552.05 W	504,029.21	725,969.25	0.46	-426.79	112.38	
9,206.00	9.83	228.84	9,135.11	485.41 S	552.30 W	504,028.99	725,969.00	0.46	-426.99	112.33	
9,208.00	9.83	228.89	9,137.08	485.64 S	552.56 W	504,028.76	725,968.74	0.46	-427.19	112.28	
9,210.00	9.82	228.94	9,139.05	485.86 S	552.82 W	504,028.54	725,968.48	0.46	-427.39	112.23	
9,212.00	9.82	228.99	9,141.02	486.09 S	553.08 W	504,028.31	725,968.22	0.46	-427.58	112.18	
9,214.00	9.82	229.04	9,142.99	486.31 S	553.33 W	504,028.09	725,967.97	0.46	-427.78	112.13	
9,216.00	9.81	229.09	9,144.96	486.53 S	553.59 W	504,027.87	725,967.71	0.46	-427.97	112.08	
9,218.00	9.81	229.14	9,146.93	486.76 S	553.85 W	504,027.64	725,967.45	0.46	-428.17	112.03	
9,220.00	9.81	229.19	9,148.90	486.98 S	554.11 W	504,027.42	725,967.19	0.46	-428.37	111.98	
9,222.00	9.80	229.24	9,150.87	487.20 S	554.36 W	504,027.20	725,966.94	0.46	-428.56	111.93	
9,224.00	9.80	229.29	9,152.84	487.43 S	554.62 W	504,026.97	725,966.68	0.46	-428.76	111.88	
9,226.00	9.80	229.34	9,154.82	487.65 S	554.88 W	504,026.75	725,966.42	0.46	-428.95	111.84	
9,228.00	9.79	229.39	9,156.79	487.87 S	555.14 W	504,026.53	725,966.16	0.46	-429.14	111.79	
9,230.00	9.79	229.44	9,158.76	488.09 S	555.40 W	504,026.31	725,965.90	0.46	-429.34	111.74	
9,232.00	9.79	229.49	9,160.73	488.31 S	555.66 W	504,026.09	725,965.64	0.46	-429.53	111.69	



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Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
9,234.00	9.78	229.54	9,162.70	488.53 S	555.91 W	504,025.87	725,965.39	0.46	-429.73	111.64	
9,236.00	9.78	229.59	9,164.67	488.75 S	556.17 W	504,025.65	725,965.13	0.46	-429.92	111.59	
9,238.00	9.78	229.64	9,166.64	488.97 S	556.43 W	504,025.43	725,964.87	0.46	-430.11	111.54	
9,240.00	9.77	229.69	9,168.61	489.19 S	556.69 W	504,025.21	725,964.61	0.46	-430.30	111.49	
9,242.00	9.77	229.74	9,170.58	489.41 S	556.95 W	504,024.99	725,964.35	0.46	-430.50	111.44	
9,244.00	9.77	229.79	9,172.55	489.63 S	557.21 W	504,024.77	725,964.09	0.46	-430.69	111.39	
9,246.00	9.76	229.84	9,174.53	489.85 S	557.47 W	504,024.55	725,963.83	0.46	-430.88	111.34	
9,248.00	9.76	229.89	9,176.50	490.07 S	557.73 W	504,024.33	725,963.57	0.46	-431.07	111.29	
9,250.00	9.76	229.95	9,178.47	490.29 S	557.99 W	504,024.11	725,963.31	0.46	-431.26	111.24	
9,252.00	9.75	230.00	9,180.44	490.50 S	558.25 W	504,023.90	725,963.05	0.46	-431.45	111.19	
9,254.00	9.75	230.05	9,182.41	490.72 S	558.50 W	504,023.68	725,962.80	0.46	-431.64	111.14	
9,256.00	9.75	230.10	9,184.38	490.94 S	558.76 W	504,023.46	725,962.54	0.46	-431.83	111.09	
9,258.00	9.74	230.15	9,186.35	491.16 S	559.02 W	504,023.24	725,962.28	0.46	-432.02	111.04	
9,260.00	9.74	230.20	9,188.32	491.37 S	559.28 W	504,023.03	725,962.02	0.46	-432.21	110.99	
9,262.00	9.74	230.25	9,190.29	491.59 S	559.54 W	504,022.81	725,961.76	0.46	-432.40	110.94	
9,264.00	9.73	230.30	9,192.27	491.80 S	559.80 W	504,022.60	725,961.50	0.46	-432.59	110.88	
9,266.00	9.73	230.35	9,194.24	492.02 S	560.06 W	504,022.38	725,961.24	0.46	-432.78	110.83	
9,268.00	9.73	230.40	9,196.21	492.24 S	560.32 W	504,022.16	725,960.98	0.46	-432.96	110.78	
9,270.00	9.72	230.46	9,198.18	492.45 S	560.58 W	504,021.95	725,960.72	0.46	-433.15	110.73	
9,272.00	9.72	230.51	9,200.15	492.67 S	560.85 W	504,021.73	725,960.45	0.46	-433.34	110.68	
9,274.00	9.72	230.56	9,202.12	492.88 S	561.11 W	504,021.52	725,960.19	0.46	-433.53	110.63	
9,276.00	9.71	230.61	9,204.09	493.09 S	561.37 W	504,021.31	725,959.93	0.46	-433.71	110.58	
9,278.00	9.71	230.66	9,206.06	493.31 S	561.63 W	504,021.09	725,959.67	0.46	-433.90	110.53	
9,280.00	9.71	230.71	9,208.04	493.52 S	561.89 W	504,020.88	725,959.41	0.46	-434.09	110.48	
9,282.00	9.70	230.76	9,210.01	493.74 S	562.15 W	504,020.66	725,959.15	0.46	-434.27	110.43	
9,284.00	9.70	230.82	9,211.98	493.95 S	562.41 W	504,020.45	725,958.89	0.46	-434.46	110.38	
9,286.00	9.70	230.87	9,213.95	494.16 S	562.67 W	504,020.24	725,958.63	0.46	-434.64	110.33	
9,288.00	9.69	230.92	9,215.92	494.37 S	562.93 W	504,020.03	725,958.37	0.46	-434.83	110.28	
9,290.00	9.69	230.97	9,217.89	494.59 S	563.19 W	504,019.81	725,958.11	0.46	-435.01	110.23	
9,292.00	9.69	230.94	9,219.86	494.80 S	563.46 W	504,019.60	725,957.84	0.29	-435.20	-71.69	
9,294.00	9.69	230.90	9,221.84	495.01 S	563.72 W	504,019.39	725,957.58	0.29	-435.38	-71.66	
9,296.00	9.70	230.87	9,223.81	495.22 S	563.98 W	504,019.18	725,957.32	0.29	-435.57	-71.63	
9,298.00	9.70	230.84	9,225.78	495.44 S	564.24 W	504,018.96	725,957.06	0.29	-435.75	-71.60	
9,300.00	9.70	230.80	9,227.75	495.65 S	564.50 W	504,018.75	725,956.80	0.29	-435.94	-71.56	
9,302.00	9.70	230.77	9,229.72	495.86 S	564.76 W	504,018.54	725,956.54	0.29	-436.12	-71.53	
9,304.00	9.70	230.74	9,231.69	496.07 S	565.02 W	504,018.33	725,956.28	0.29	-436.31	-71.50	



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Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
9,306.00	9.70	230.71	9,233.66	496.29 S	565.28 W	504,018.11	725,956.02	0.29	-436.49	-71.47	
9,308.00	9.71	230.67	9,235.64	496.50 S	565.55 W	504,017.90	725,955.75	0.29	-436.68	-71.43	
9,310.00	9.71	230.64	9,237.61	496.72 S	565.81 W	504,017.68	725,955.49	0.29	-436.87	-71.40	
9,312.00	9.71	230.61	9,239.58	496.93 S	566.07 W	504,017.47	725,955.23	0.29	-437.05	-71.37	
9,314.00	9.71	230.57	9,241.55	497.14 S	566.33 W	504,017.26	725,954.97	0.29	-437.24	-71.34	
9,316.00	9.71	230.54	9,243.52	497.36 S	566.59 W	504,017.04	725,954.71	0.29	-437.43	-71.30	
9,318.00	9.72	230.51	9,245.49	497.57 S	566.85 W	504,016.83	725,954.45	0.29	-437.61	-71.27	
9,320.00	9.72	230.48	9,247.46	497.79 S	567.11 W	504,016.61	725,954.19	0.29	-437.80	-71.24	
9,322.00	9.72	230.44	9,249.43	498.00 S	567.37 W	504,016.40	725,953.93	0.29	-437.99	-71.21	
9,324.00	9.72	230.41	9,251.41	498.22 S	567.63 W	504,016.18	725,953.67	0.29	-438.18	-71.17	
9,326.00	9.72	230.38	9,253.38	498.43 S	567.89 W	504,015.97	725,953.41	0.29	-438.36	-71.14	
9,328.00	9.73	230.34	9,255.35	498.65 S	568.15 W	504,015.75	725,953.15	0.29	-438.55	-71.11	
9,330.00	9.73	230.31	9,257.32	498.86 S	568.41 W	504,015.54	725,952.89	0.29	-438.74	-71.08	
9,332.00	9.73	230.28	9,259.29	499.08 S	568.67 W	504,015.32	725,952.63	0.29	-438.93	-71.04	
9,334.00	9.73	230.25	9,261.26	499.30 S	568.93 W	504,015.10	725,952.37	0.29	-439.12	-71.01	
9,336.00	9.73	230.21	9,263.23	499.51 S	569.19 W	504,014.89	725,952.11	0.29	-439.31	-70.98	
9,338.00	9.74	230.18	9,265.20	499.73 S	569.45 W	504,014.67	725,951.85	0.29	-439.50	-70.95	
9,340.00	9.74	230.15	9,267.18	499.95 S	569.71 W	504,014.45	725,951.59	0.29	-439.68	-70.92	
9,342.00	9.74	230.11	9,269.15	500.16 S	569.97 W	504,014.24	725,951.33	0.29	-439.87	-70.88	
9,344.00	9.74	230.08	9,271.12	500.38 S	570.23 W	504,014.02	725,951.07	0.29	-440.06	-70.85	
9,346.00	9.74	230.05	9,273.09	500.60 S	570.49 W	504,013.80	725,950.81	0.29	-440.25	-70.82	
9,348.00	9.74	230.02	9,275.06	500.81 S	570.75 W	504,013.59	725,950.55	0.29	-440.44	-70.79	
9,350.00	9.75	229.98	9,277.03	501.03 S	571.01 W	504,013.37	725,950.29	0.29	-440.63	-70.75	
9,352.00	9.75	229.95	9,279.00	501.25 S	571.27 W	504,013.15	725,950.03	0.29	-440.82	-70.72	
9,354.00	9.75	229.92	9,280.97	501.47 S	571.53 W	504,012.93	725,949.77	0.29	-441.01	-70.69	
9,356.00	9.75	229.89	9,282.95	501.69 S	571.78 W	504,012.71	725,949.52	0.29	-441.21	-70.66	
9,358.00	9.75	229.85	9,284.92	501.90 S	572.04 W	504,012.50	725,949.26	0.29	-441.40	-70.63	
9,360.00	9.76	229.82	9,286.89	502.12 S	572.30 W	504,012.28	725,949.00	0.29	-441.59	-70.59	
9,362.00	9.76	229.79	9,288.86	502.34 S	572.56 W	504,012.06	725,948.74	0.29	-441.78	-70.56	
9,364.00	9.76	229.76	9,290.83	502.56 S	572.82 W	504,011.84	725,948.48	0.29	-441.97	-70.53	
9,366.00	9.76	229.72	9,292.80	502.78 S	573.08 W	504,011.62	725,948.22	0.29	-442.16	-70.50	
9,368.00	9.76	229.69	9,294.77	503.00 S	573.34 W	504,011.40	725,947.96	0.29	-442.35	-70.46	
9,370.00	9.77	229.66	9,296.74	503.22 S	573.60 W	504,011.18	725,947.70	0.29	-442.55	-70.43	
9,372.00	9.77	229.63	9,298.71	503.44 S	573.85 W	504,010.96	725,947.45	0.29	-442.74	-70.40	
9,374.00	9.77	229.59	9,300.68	503.66 S	574.11 W	504,010.74	725,947.19	0.29	-442.93	-70.37	
9,376.00	9.77	229.56	9,302.66	503.88 S	574.37 W	504,010.52	725,946.93	0.29	-443.12	-70.34	
9,378.00	9.77	229.53	9,304.63	504.10 S	574.63 W	504,010.30	725,946.67	0.29	-443.32	-70.30	



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Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
9,380.00	9.78	229.49	9,306.60	504.32 S	574.89 W	504,010.08	725,946.41	0.29	-443.51	-70.27	
9,382.00	9.78	229.46	9,308.57	504.54 S	575.15 W	504,009.86	725,946.15	0.29	-443.70	-70.24	
9,384.00	9.78	229.43	9,310.54	504.76 S	575.40 W	504,009.64	725,945.90	0.29	-443.90	-70.21	
9,386.00	9.79	229.44	9,312.51	504.98 S	575.66 W	504,009.42	725,945.64	0.76	-444.09	9.33	
9,388.00	9.81	229.46	9,314.48	505.20 S	575.92 W	504,009.20	725,945.38	0.76	-444.29	9.31	
9,390.00	9.82	229.47	9,316.45	505.42 S	576.18 W	504,008.98	725,945.12	0.76	-444.48	9.30	
9,392.00	9.84	229.49	9,318.42	505.65 S	576.44 W	504,008.75	725,944.86	0.76	-444.67	9.29	
9,394.00	9.85	229.50	9,320.39	505.87 S	576.70 W	504,008.53	725,944.60	0.76	-444.87	9.27	
9,396.00	9.87	229.52	9,322.36	506.09 S	576.96 W	504,008.31	725,944.34	0.76	-445.06	9.26	
9,398.00	9.88	229.53	9,324.33	506.31 S	577.22 W	504,008.09	725,944.08	0.76	-445.26	9.24	
9,400.00	9.90	229.54	9,326.30	506.54 S	577.48 W	504,007.86	725,943.82	0.76	-445.45	9.23	
9,402.00	9.91	229.56	9,328.27	506.76 S	577.75 W	504,007.64	725,943.55	0.76	-445.65	9.22	
9,404.00	9.93	229.57	9,330.24	506.98 S	578.01 W	504,007.42	725,943.29	0.76	-445.85	9.20	
9,406.00	9.94	229.59	9,332.21	507.21 S	578.27 W	504,007.19	725,943.03	0.76	-446.04	9.19	
9,408.00	9.96	229.60	9,334.18	507.43 S	578.53 W	504,006.97	725,942.77	0.76	-446.24	9.17	
9,410.00	9.97	229.61	9,336.15	507.66 S	578.80 W	504,006.74	725,942.50	0.76	-446.43	9.16	
9,412.00	9.99	229.63	9,338.12	507.88 S	579.06 W	504,006.52	725,942.24	0.76	-446.63	9.15	
9,414.00	10.00	229.64	9,340.09	508.11 S	579.33 W	504,006.29	725,941.97	0.76	-446.83	9.13	
9,416.00	10.02	229.66	9,342.06	508.33 S	579.59 W	504,006.07	725,941.71	0.76	-447.03	9.12	
9,418.00	10.03	229.67	9,344.03	508.56 S	579.86 W	504,005.84	725,941.44	0.76	-447.22	9.11	
9,420.00	10.05	229.68	9,346.00	508.78 S	580.12 W	504,005.62	725,941.18	0.76	-447.42	9.09	
9,422.00	10.06	229.70	9,347.97	509.01 S	580.39 W	504,005.39	725,940.91	0.76	-447.62	9.08	
9,424.00	10.08	229.71	9,349.94	509.23 S	580.66 W	504,005.17	725,940.64	0.76	-447.82	9.07	
9,426.00	10.09	229.72	9,351.91	509.46 S	580.92 W	504,004.94	725,940.38	0.76	-448.01	9.05	
9,428.00	10.11	229.74	9,353.88	509.69 S	581.19 W	504,004.71	725,940.11	0.76	-448.21	9.04	
9,430.00	10.12	229.75	9,355.85	509.91 S	581.46 W	504,004.49	725,939.84	0.76	-448.41	9.03	
9,432.00	10.14	229.76	9,357.82	510.14 S	581.73 W	504,004.26	725,939.57	0.76	-448.61	9.01	
9,434.00	10.15	229.78	9,359.78	510.37 S	582.00 W	504,004.03	725,939.30	0.76	-448.81	9.00	
9,436.00	10.17	229.79	9,361.75	510.60 S	582.26 W	504,003.80	725,939.04	0.76	-449.01	8.99	
9,438.00	10.18	229.80	9,363.72	510.82 S	582.53 W	504,003.58	725,938.77	0.76	-449.21	8.97	
9,440.00	10.20	229.82	9,365.69	511.05 S	582.81 W	504,003.35	725,938.49	0.76	-449.41	8.96	
9,442.00	10.21	229.83	9,367.66	511.28 S	583.08 W	504,003.12	725,938.22	0.76	-449.61	8.95	
9,444.00	10.23	229.84	9,369.63	511.51 S	583.35 W	504,002.89	725,937.95	0.76	-449.81	8.93	
9,446.00	10.24	229.86	9,371.60	511.74 S	583.62 W	504,002.66	725,937.68	0.76	-450.01	8.92	
9,448.00	10.26	229.87	9,373.56	511.97 S	583.89 W	504,002.43	725,937.41	0.76	-450.21	8.91	
9,450.00	10.27	229.88	9,375.53	512.20 S	584.16 W	504,002.20	725,937.14	0.76	-450.41	8.89	
9,452.00	10.29	229.90	9,377.50	512.43 S	584.44 W	504,001.97	725,936.86	0.76	-450.61	8.88	



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				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
9,454.00	10.30	229.91	9,379.47	512.66 S	584.71 W	504,001.74	725,936.59	0.76	-450.81	8.87	
9,456.00	10.32	229.92	9,381.43	512.89 S	584.98 W	504,001.51	725,936.32	0.76	-451.01	8.86	
9,458.00	10.33	229.94	9,383.40	513.12 S	585.26 W	504,001.28	725,936.04	0.76	-451.22	8.84	
9,460.00	10.35	229.95	9,385.37	513.35 S	585.53 W	504,001.05	725,935.77	0.76	-451.42	8.83	
9,462.00	10.36	229.96	9,387.34	513.58 S	585.81 W	504,000.82	725,935.49	0.76	-451.62	8.82	
9,464.00	10.38	229.97	9,389.30	513.81 S	586.08 W	504,000.59	725,935.22	0.76	-451.82	8.80	
9,466.00	10.39	229.99	9,391.27	514.05 S	586.36 W	504,000.35	725,934.94	0.76	-452.03	8.79	
9,468.00	10.41	230.00	9,393.24	514.28 S	586.64 W	504,000.12	725,934.66	0.76	-452.23	8.78	
9,470.00	10.42	230.01	9,395.21	514.51 S	586.91 W	503,999.89	725,934.39	0.76	-452.43	8.77	
9,472.00	10.44	230.03	9,397.17	514.74 S	587.19 W	503,999.66	725,934.11	0.76	-452.64	8.75	
9,474.00	10.45	230.04	9,399.14	514.98 S	587.47 W	503,999.42	725,933.83	0.76	-452.84	8.74	
9,476.00	10.47	230.05	9,401.11	515.21 S	587.75 W	503,999.19	725,933.55	0.76	-453.04	8.73	
9,478.00	10.48	230.06	9,403.07	515.44 S	588.03 W	503,998.96	725,933.27	0.76	-453.25	8.72	
9,480.00	10.49	230.11	9,405.04	515.68 S	588.30 W	503,998.72	725,933.00	0.50	-453.45	53.53	
9,482.00	10.49	230.18	9,407.01	515.91 S	588.58 W	503,998.49	725,932.72	0.71	-453.65	101.98	
9,484.00	10.48	230.26	9,408.97	516.14 S	588.86 W	503,998.26	725,932.44	0.71	-453.86	101.90	
9,486.00	10.48	230.34	9,410.94	516.37 S	589.14 W	503,998.03	725,932.16	0.71	-454.06	101.83	
9,488.00	10.48	230.41	9,412.91	516.61 S	589.42 W	503,997.79	725,931.88	0.71	-454.26	101.75	
9,490.00	10.47	230.49	9,414.87	516.84 S	589.70 W	503,997.56	725,931.60	0.71	-454.47	101.68	
9,492.00	10.47	230.57	9,416.84	517.07 S	589.99 W	503,997.33	725,931.31	0.71	-454.67	101.60	
9,494.00	10.47	230.65	9,418.81	517.30 S	590.27 W	503,997.10	725,931.03	0.71	-454.87	101.53	
9,496.00	10.47	230.72	9,420.77	517.53 S	590.55 W	503,996.87	725,930.75	0.71	-455.07	101.45	
9,498.00	10.46	230.80	9,422.74	517.76 S	590.83 W	503,996.64	725,930.47	0.71	-455.27	101.38	
9,500.00	10.46	230.88	9,424.71	517.99 S	591.11 W	503,996.41	725,930.19	0.71	-455.47	101.30	
9,502.00	10.46	230.95	9,426.67	518.22 S	591.39 W	503,996.18	725,929.91	0.71	-455.67	101.22	
9,504.00	10.45	231.03	9,428.64	518.45 S	591.67 W	503,995.95	725,929.63	0.71	-455.87	101.15	
9,506.00	10.45	231.11	9,430.61	518.67 S	591.96 W	503,995.73	725,929.34	0.71	-456.06	101.07	
9,508.00	10.45	231.18	9,432.57	518.90 S	592.24 W	503,995.50	725,929.06	0.71	-456.26	101.00	
9,510.00	10.45	231.26	9,434.54	519.13 S	592.52 W	503,995.27	725,928.78	0.71	-456.46	100.92	
9,512.00	10.44	231.34	9,436.51	519.36 S	592.80 W	503,995.04	725,928.50	0.71	-456.66	100.85	
9,514.00	10.44	231.42	9,438.47	519.58 S	593.09 W	503,994.82	725,928.21	0.71	-456.85	100.77	
9,516.00	10.44	231.49	9,440.44	519.81 S	593.37 W	503,994.59	725,927.93	0.71	-457.05	100.69	
9,518.00	10.44	231.57	9,442.41	520.03 S	593.65 W	503,994.37	725,927.65	0.71	-457.24	100.62	
9,520.00	10.43	231.65	9,444.37	520.26 S	593.94 W	503,994.14	725,927.36	0.71	-457.44	100.54	
9,522.00	10.43	231.73	9,446.34	520.48 S	594.22 W	503,993.92	725,927.08	0.71	-457.63	100.47	
9,524.00	10.43	231.80	9,448.31	520.71 S	594.51 W	503,993.69	725,926.79	0.71	-457.83	100.39	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
9,526.00	10.43	231.88	9,450.28	520.93 S	594.79 W	503,993.47	725,926.51	0.71	-458.02	100.31	
9,528.00	10.42	231.96	9,452.24	521.15 S	595.08 W	503,993.25	725,926.22	0.71	-458.21	100.24	
9,530.00	10.42	232.04	9,454.21	521.38 S	595.36 W	503,993.02	725,925.94	0.71	-458.41	100.16	
9,532.00	10.42	232.11	9,456.18	521.60 S	595.65 W	503,992.80	725,925.65	0.71	-458.60	100.08	
9,534.00	10.42	232.19	9,458.14	521.82 S	595.93 W	503,992.58	725,925.37	0.71	-458.79	100.01	
9,536.00	10.41	232.27	9,460.11	522.04 S	596.22 W	503,992.36	725,925.08	0.71	-458.98	99.93	
9,538.00	10.41	232.35	9,462.08	522.26 S	596.50 W	503,992.14	725,924.80	0.71	-459.17	99.86	
9,540.00	10.41	232.42	9,464.05	522.48 S	596.79 W	503,991.92	725,924.51	0.71	-459.36	99.78	
9,542.00	10.41	232.50	9,466.01	522.70 S	597.08 W	503,991.70	725,924.22	0.71	-459.55	99.70	
9,544.00	10.40	232.58	9,467.98	522.92 S	597.36 W	503,991.48	725,923.94	0.71	-459.74	99.63	
9,546.00	10.40	232.66	9,469.95	523.14 S	597.65 W	503,991.26	725,923.65	0.71	-459.93	99.55	
9,548.00	10.40	232.73	9,471.91	523.36 S	597.94 W	503,991.04	725,923.36	0.71	-460.12	99.47	
9,550.00	10.40	232.81	9,473.88	523.58 S	598.23 W	503,990.82	725,923.07	0.71	-460.31	99.40	
9,552.00	10.39	232.89	9,475.85	523.80 S	598.51 W	503,990.60	725,922.79	0.71	-460.50	99.32	
9,554.00	10.39	232.97	9,477.82	524.01 S	598.80 W	503,990.39	725,922.50	0.71	-460.68	99.24	
9,556.00	10.39	233.05	9,479.78	524.23 S	599.09 W	503,990.17	725,922.21	0.71	-460.87	99.17	
9,558.00	10.39	233.12	9,481.75	524.45 S	599.38 W	503,989.95	725,921.92	0.71	-461.06	99.09	
9,560.00	10.39	233.20	9,483.72	524.66 S	599.67 W	503,989.74	725,921.63	0.71	-461.24	99.01	
9,562.00	10.38	233.28	9,485.68	524.88 S	599.95 W	503,989.52	725,921.35	0.71	-461.43	98.94	
9,564.00	10.38	233.36	9,487.65	525.10 S	600.24 W	503,989.30	725,921.06	0.71	-461.61	98.86	
9,566.00	10.38	233.44	9,489.62	525.31 S	600.53 W	503,989.09	725,920.77	0.71	-461.80	98.78	
9,568.00	10.38	233.52	9,491.59	525.53 S	600.82 W	503,988.87	725,920.48	0.71	-461.98	98.71	
9,570.00	10.37	233.59	9,493.55	525.74 S	601.11 W	503,988.66	725,920.19	0.71	-462.17	98.63	
9,572.00	10.37	233.67	9,495.52	525.95 S	601.40 W	503,988.45	725,919.90	0.71	-462.35	98.55	
9,574.00	10.37	233.75	9,497.49	526.17 S	601.69 W	503,988.23	725,919.61	0.71	-462.53	98.47	
9,576.00	10.37	233.87	9,499.46	526.38 S	601.98 W	503,988.02	725,919.32	1.07	-462.71	78.86	
9,578.00	10.38	233.98	9,501.42	526.59 S	602.27 W	503,987.81	725,919.03	1.07	-462.89	78.74	
9,580.00	10.38	234.10	9,503.39	526.80 S	602.57 W	503,987.60	725,918.73	1.07	-463.08	78.63	
9,582.00	10.39	234.22	9,505.36	527.01 S	602.86 W	503,987.39	725,918.44	1.07	-463.26	78.51	
9,584.00	10.39	234.33	9,507.32	527.22 S	603.15 W	503,987.18	725,918.15	1.07	-463.44	78.40	
9,586.00	10.40	234.45	9,509.29	527.43 S	603.44 W	503,986.97	725,917.86	1.07	-463.62	78.28	
9,588.00	10.40	234.56	9,511.26	527.64 S	603.74 W	503,986.76	725,917.56	1.07	-463.79	78.17	
9,590.00	10.40	234.68	9,513.23	527.85 S	604.03 W	503,986.55	725,917.27	1.07	-463.97	78.06	
9,592.00	10.41	234.80	9,515.19	528.06 S	604.33 W	503,986.34	725,916.97	1.07	-464.15	77.94	
9,594.00	10.41	234.91	9,517.16	528.27 S	604.62 W	503,986.13	725,916.68	1.07	-464.33	77.83	
9,596.00	10.42	235.03	9,519.13	528.48 S	604.92 W	503,985.92	725,916.38	1.07	-464.50	77.71	
9,598.00	10.42	235.14	9,521.09	528.68 S	605.22 W	503,985.72	725,916.08	1.07	-464.68	77.60	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
9,600.00	10.43	235.26	9,523.06	528.89 S	605.51 W	503,985.51	725,915.79	1.07	-464.85	77.49	
9,602.00	10.43	235.37	9,525.03	529.10 S	605.81 W	503,985.30	725,915.49	1.07	-465.03	77.37	
9,604.00	10.44	235.49	9,526.99	529.30 S	606.11 W	503,985.10	725,915.19	1.07	-465.20	77.26	
9,606.00	10.44	235.60	9,528.96	529.51 S	606.41 W	503,984.89	725,914.89	1.07	-465.38	77.15	
9,608.00	10.45	235.72	9,530.93	529.71 S	606.71 W	503,984.69	725,914.59	1.07	-465.55	77.03	
9,610.00	10.45	235.83	9,532.90	529.92 S	607.01 W	503,984.48	725,914.29	1.07	-465.72	76.92	
9,612.00	10.46	235.95	9,534.86	530.12 S	607.31 W	503,984.28	725,913.99	1.07	-465.90	76.81	
9,614.00	10.46	236.06	9,536.83	530.32 S	607.61 W	503,984.08	725,913.69	1.07	-466.07	76.69	
9,616.00	10.47	236.18	9,538.80	530.52 S	607.91 W	503,983.88	725,913.39	1.07	-466.24	76.58	
9,618.00	10.47	236.29	9,540.76	530.73 S	608.21 W	503,983.67	725,913.09	1.07	-466.41	76.47	
9,620.00	10.48	236.41	9,542.73	530.93 S	608.51 W	503,983.47	725,912.79	1.07	-466.58	76.36	
9,622.00	10.48	236.52	9,544.70	531.13 S	608.82 W	503,983.27	725,912.48	1.07	-466.75	76.24	
9,624.00	10.49	236.64	9,546.66	531.33 S	609.12 W	503,983.07	725,912.18	1.07	-466.92	76.13	
9,626.00	10.49	236.75	9,548.63	531.53 S	609.43 W	503,982.87	725,911.87	1.07	-467.08	76.02	
9,628.00	10.50	236.86	9,550.60	531.73 S	609.73 W	503,982.67	725,911.57	1.07	-467.25	75.91	
9,630.00	10.50	236.98	9,552.56	531.93 S	610.04 W	503,982.47	725,911.26	1.07	-467.42	75.79	
9,632.00	10.51	237.09	9,554.53	532.13 S	610.34 W	503,982.27	725,910.96	1.07	-467.58	75.68	
9,634.00	10.51	237.21	9,556.49	532.32 S	610.65 W	503,982.08	725,910.65	1.07	-467.75	75.57	
9,636.00	10.52	237.32	9,558.46	532.52 S	610.96 W	503,981.88	725,910.34	1.07	-467.92	75.46	
9,638.00	10.52	237.43	9,560.43	532.72 S	611.26 W	503,981.68	725,910.04	1.07	-468.08	75.35	
9,640.00	10.53	237.55	9,562.39	532.91 S	611.57 W	503,981.49	725,909.73	1.07	-468.24	75.24	
9,642.00	10.53	237.66	9,564.36	533.11 S	611.88 W	503,981.29	725,909.42	1.07	-468.41	75.12	
9,644.00	10.54	237.77	9,566.33	533.31 S	612.19 W	503,981.09	725,909.11	1.07	-468.57	75.01	
9,646.00	10.55	237.89	9,568.29	533.50 S	612.50 W	503,980.90	725,908.80	1.07	-468.73	74.90	
9,648.00	10.55	238.00	9,570.26	533.69 S	612.81 W	503,980.71	725,908.49	1.07	-468.90	74.79	
9,650.00	10.56	238.11	9,572.23	533.89 S	613.12 W	503,980.51	725,908.18	1.07	-469.06	74.68	
9,652.00	10.56	238.22	9,574.19	534.08 S	613.43 W	503,980.32	725,907.87	1.07	-469.22	74.57	
9,654.00	10.57	238.34	9,576.16	534.27 S	613.74 W	503,980.13	725,907.56	1.07	-469.38	74.46	
9,656.00	10.57	238.45	9,578.12	534.47 S	614.06 W	503,979.93	725,907.24	1.07	-469.54	74.35	
9,658.00	10.58	238.56	9,580.09	534.66 S	614.37 W	503,979.74	725,906.93	1.07	-469.70	74.24	
9,660.00	10.59	238.67	9,582.06	534.85 S	614.68 W	503,979.55	725,906.62	1.07	-469.86	74.13	
9,662.00	10.59	238.78	9,584.02	535.04 S	615.00 W	503,979.36	725,906.30	1.07	-470.01	74.02	
9,664.00	10.60	238.90	9,585.99	535.23 S	615.31 W	503,979.17	725,905.99	1.07	-470.17	73.91	
9,666.00	10.60	239.01	9,587.95	535.42 S	615.63 W	503,978.98	725,905.67	1.07	-470.33	73.80	
9,668.00	10.61	239.12	9,589.92	535.61 S	615.94 W	503,978.79	725,905.36	1.07	-470.48	73.69	
9,670.00	10.60	239.16	9,591.88	535.80 S	616.26 W	503,978.60	725,905.04	0.59	-470.64	142.71	
9,672.00	10.59	239.20	9,593.85	535.99 S	616.57 W	503,978.41	725,904.73	0.59	-470.80	142.68	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
9,674.00	10.58	239.24	9,595.82	536.18 S	616.89 W	503,978.22	725,904.41	0.59	-470.95	142.64	
9,676.00	10.57	239.28	9,597.78	536.36 S	617.21 W	503,978.04	725,904.09	0.59	-471.11	142.60	
9,678.00	10.56	239.31	9,599.75	536.55 S	617.52 W	503,977.85	725,903.78	0.59	-471.26	142.56	
9,680.00	10.55	239.35	9,601.71	536.74 S	617.84 W	503,977.66	725,903.46	0.59	-471.41	142.52	
9,682.00	10.54	239.39	9,603.68	536.92 S	618.15 W	503,977.48	725,903.15	0.59	-471.57	142.48	
9,684.00	10.54	239.43	9,605.65	537.11 S	618.47 W	503,977.29	725,902.83	0.59	-471.72	142.45	
9,686.00	10.53	239.47	9,607.61	537.30 S	618.78 W	503,977.10	725,902.52	0.59	-471.87	142.41	
9,688.00	10.52	239.51	9,609.58	537.48 S	619.10 W	503,976.92	725,902.20	0.59	-472.03	142.37	
9,690.00	10.51	239.55	9,611.55	537.67 S	619.41 W	503,976.73	725,901.89	0.59	-472.18	142.33	
9,692.00	10.50	239.59	9,613.51	537.85 S	619.72 W	503,976.55	725,901.58	0.59	-472.33	142.29	
9,694.00	10.49	239.63	9,615.48	538.04 S	620.04 W	503,976.36	725,901.26	0.59	-472.48	142.25	
9,696.00	10.48	239.67	9,617.45	538.22 S	620.35 W	503,976.18	725,900.95	0.59	-472.63	142.21	
9,698.00	10.47	239.71	9,619.41	538.40 S	620.67 W	503,976.00	725,900.63	0.59	-472.78	142.18	
9,700.00	10.46	239.75	9,621.38	538.59 S	620.98 W	503,975.81	725,900.32	0.59	-472.93	142.14	
9,702.00	10.45	239.79	9,623.35	538.77 S	621.29 W	503,975.63	725,900.01	0.59	-473.08	142.10	
9,704.00	10.44	239.83	9,625.31	538.95 S	621.61 W	503,975.45	725,899.69	0.59	-473.23	142.06	
9,706.00	10.43	239.87	9,627.28	539.13 S	621.92 W	503,975.27	725,899.38	0.59	-473.38	142.02	
9,708.00	10.42	239.91	9,629.25	539.31 S	622.23 W	503,975.09	725,899.07	0.59	-473.53	141.98	
9,710.00	10.41	239.95	9,631.21	539.50 S	622.55 W	503,974.90	725,898.75	0.59	-473.68	141.94	
9,712.00	10.41	239.99	9,633.18	539.68 S	622.86 W	503,974.72	725,898.44	0.59	-473.83	141.90	
9,714.00	10.40	240.03	9,635.15	539.86 S	623.17 W	503,974.54	725,898.13	0.59	-473.98	141.86	
9,716.00	10.39	240.07	9,637.12	540.04 S	623.48 W	503,974.36	725,897.82	0.59	-474.12	141.82	
9,718.00	10.38	240.11	9,639.08	540.22 S	623.80 W	503,974.18	725,897.50	0.59	-474.27	141.78	
9,720.00	10.37	240.15	9,641.05	540.40 S	624.11 W	503,974.00	725,897.19	0.59	-474.42	141.74	
9,722.00	10.36	240.19	9,643.02	540.58 S	624.42 W	503,973.82	725,896.88	0.59	-474.56	141.70	
9,724.00	10.35	240.23	9,644.98	540.75 S	624.73 W	503,973.65	725,896.57	0.59	-474.71	141.66	
9,726.00	10.36	240.05	9,646.95	540.93 S	625.05 W	503,973.47	725,896.25	1.64	-474.86	-74.10	
9,728.00	10.37	239.88	9,648.92	541.11 S	625.36 W	503,973.29	725,895.94	1.64	-475.00	-73.92	
9,730.00	10.38	239.70	9,650.89	541.29 S	625.67 W	503,973.11	725,895.63	1.64	-475.15	-73.75	
9,732.00	10.39	239.53	9,652.85	541.48 S	625.98 W	503,972.92	725,895.32	1.64	-475.30	-73.58	
9,734.00	10.40	239.36	9,654.82	541.66 S	626.29 W	503,972.74	725,895.01	1.64	-475.45	-73.41	
9,736.00	10.41	239.18	9,656.79	541.84 S	626.60 W	503,972.56	725,894.70	1.64	-475.61	-73.24	
9,738.00	10.42	239.01	9,658.76	542.03 S	626.91 W	503,972.37	725,894.39	1.64	-475.76	-73.07	
9,740.00	10.42	238.83	9,660.72	542.22 S	627.22 W	503,972.18	725,894.08	1.64	-475.91	-72.89	
9,742.00	10.43	238.66	9,662.69	542.40 S	627.53 W	503,972.00	725,893.77	1.64	-476.07	-72.72	
9,744.00	10.44	238.49	9,664.66	542.59 S	627.84 W	503,971.81	725,893.46	1.64	-476.23	-72.55	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
9,746.00	10.45	238.32	9,666.62	542.78 S	628.15 W	503,971.62	725,893.15	1.64	-476.38	-72.38	
9,748.00	10.46	238.14	9,668.59	542.97 S	628.46 W	503,971.43	725,892.84	1.64	-476.54	-72.21	
9,750.00	10.47	237.97	9,670.56	543.17 S	628.76 W	503,971.23	725,892.54	1.64	-476.70	-72.04	
9,752.00	10.49	237.80	9,672.52	543.36 S	629.07 W	503,971.04	725,892.23	1.64	-476.86	-71.88	
9,754.00	10.50	237.63	9,674.49	543.55 S	629.38 W	503,970.85	725,891.92	1.64	-477.03	-71.71	
9,756.00	10.51	237.46	9,676.46	543.75 S	629.69 W	503,970.65	725,891.61	1.64	-477.19	-71.54	
9,758.00	10.52	237.29	9,678.42	543.95 S	630.00 W	503,970.45	725,891.30	1.64	-477.35	-71.37	
9,760.00	10.53	237.12	9,680.39	544.14 S	630.30 W	503,970.26	725,891.00	1.64	-477.52	-71.20	
9,762.00	10.54	236.95	9,682.36	544.34 S	630.61 W	503,970.06	725,890.69	1.64	-477.69	-71.04	
9,764.00	10.55	236.78	9,684.32	544.54 S	630.92 W	503,969.86	725,890.38	1.64	-477.86	-70.87	
9,766.00	10.56	236.61	9,686.29	544.75 S	631.22 W	503,969.65	725,890.08	1.64	-478.02	-70.70	
9,768.00	10.57	236.44	9,688.25	544.95 S	631.53 W	503,969.45	725,889.77	1.64	-478.19	-70.54	
9,770.00	10.58	236.27	9,690.22	545.15 S	631.83 W	503,969.25	725,889.47	1.64	-478.37	-70.37	
9,772.00	10.59	236.10	9,692.19	545.36 S	632.14 W	503,969.04	725,889.16	1.64	-478.54	-70.21	
9,774.00	10.60	235.94	9,694.15	545.56 S	632.44 W	503,968.84	725,888.86	1.64	-478.71	-70.04	
9,776.00	10.62	235.77	9,696.12	545.77 S	632.75 W	503,968.63	725,888.55	1.64	-478.89	-69.88	
9,778.00	10.63	235.60	9,698.08	545.98 S	633.05 W	503,968.42	725,888.25	1.64	-479.06	-69.71	
9,780.00	10.64	235.44	9,700.05	546.18 S	633.36 W	503,968.22	725,887.94	1.64	-479.24	-69.55	
9,782.00	10.65	235.27	9,702.01	546.39 S	633.66 W	503,968.01	725,887.64	1.64	-479.42	-69.38	
9,784.00	10.66	235.10	9,703.98	546.61 S	633.96 W	503,967.79	725,887.34	1.64	-479.60	-69.22	
9,786.00	10.67	234.94	9,705.95	546.82 S	634.27 W	503,967.58	725,887.03	1.64	-479.78	-69.06	
9,788.00	10.69	234.77	9,707.91	547.03 S	634.57 W	503,967.37	725,886.73	1.64	-479.96	-68.89	
9,790.00	10.70	234.61	9,709.88	547.25 S	634.87 W	503,967.15	725,886.43	1.64	-480.14	-68.73	
9,792.00	10.71	234.44	9,711.84	547.46 S	635.18 W	503,966.94	725,886.12	1.64	-480.33	-68.57	
9,794.00	10.72	234.28	9,713.81	547.68 S	635.48 W	503,966.72	725,885.82	1.64	-480.51	-68.41	
9,796.00	10.73	234.12	9,715.77	547.90 S	635.78 W	503,966.50	725,885.52	1.64	-480.70	-68.25	
9,798.00	10.75	233.95	9,717.74	548.11 S	636.08 W	503,966.29	725,885.22	1.64	-480.88	-68.09	
9,800.00	10.76	233.79	9,719.70	548.33 S	636.38 W	503,966.07	725,884.92	1.64	-481.07	-67.93	
9,802.00	10.77	233.63	9,721.67	548.56 S	636.68 W	503,965.84	725,884.62	1.64	-481.26	-67.77	
9,804.00	10.78	233.46	9,723.63	548.78 S	636.99 W	503,965.62	725,884.31	1.64	-481.45	-67.61	
9,806.00	10.80	233.30	9,725.60	549.00 S	637.29 W	503,965.40	725,884.01	1.64	-481.64	-67.45	
9,808.00	10.81	233.14	9,727.56	549.23 S	637.59 W	503,965.17	725,883.71	1.64	-481.84	-67.29	
9,810.00	10.82	232.98	9,729.52	549.45 S	637.89 W	503,964.95	725,883.41	1.64	-482.03	-67.13	
9,812.00	10.83	232.82	9,731.49	549.68 S	638.19 W	503,964.72	725,883.11	1.64	-482.23	-66.97	
9,814.00	10.85	232.66	9,733.45	549.91 S	638.49 W	503,964.49	725,882.81	1.64	-482.42	-66.81	
9,816.00	10.86	232.50	9,735.42	550.13 S	638.78 W	503,964.27	725,882.52	1.64	-482.62	-66.65	
9,818.00	10.87	232.34	9,737.38	550.36 S	639.08 W	503,964.04	725,882.22	1.64	-482.82	-66.50	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
9,820.00	10.89	232.15	9,739.35	550.60 S	639.38 W	503,963.80	725,881.92	1.96	-483.02	-67.33	
9,822.00	10.91	231.92	9,741.31	550.83 S	639.68 W	503,963.57	725,881.62	2.28	-483.22	-67.85	
9,824.00	10.92	231.70	9,743.27	551.06 S	639.98 W	503,963.34	725,881.32	2.28	-483.42	-67.63	
9,826.00	10.94	231.48	9,745.24	551.30 S	640.27 W	503,963.10	725,881.03	2.28	-483.63	-67.41	
9,828.00	10.96	231.26	9,747.20	551.53 S	640.57 W	503,962.87	725,880.73	2.28	-483.83	-67.20	
9,830.00	10.98	231.04	9,749.16	551.77 S	640.87 W	503,962.63	725,880.43	2.28	-484.04	-66.98	
9,832.00	10.99	230.82	9,751.13	552.01 S	641.16 W	503,962.39	725,880.14	2.28	-484.25	-66.76	
9,834.00	11.01	230.60	9,753.09	552.26 S	641.46 W	503,962.14	725,879.84	2.28	-484.46	-66.55	
9,836.00	11.03	230.38	9,755.05	552.50 S	641.75 W	503,961.90	725,879.55	2.28	-484.67	-66.33	
9,838.00	11.05	230.16	9,757.02	552.74 S	642.05 W	503,961.66	725,879.25	2.28	-484.89	-66.12	
9,840.00	11.07	229.95	9,758.98	552.99 S	642.34 W	503,961.41	725,878.96	2.28	-485.10	-65.90	
9,842.00	11.09	229.73	9,760.94	553.24 S	642.64 W	503,961.16	725,878.66	2.28	-485.32	-65.69	
9,844.00	11.11	229.52	9,762.91	553.49 S	642.93 W	503,960.91	725,878.37	2.28	-485.54	-65.48	
9,846.00	11.13	229.30	9,764.87	553.74 S	643.22 W	503,960.66	725,878.08	2.28	-485.76	-65.27	
9,848.00	11.14	229.09	9,766.83	553.99 S	643.51 W	503,960.41	725,877.79	2.28	-485.98	-65.06	
9,850.00	11.16	228.87	9,768.79	554.24 S	643.81 W	503,960.16	725,877.49	2.28	-486.20	-64.85	
9,852.00	11.18	228.66	9,770.75	554.50 S	644.10 W	503,959.90	725,877.20	2.28	-486.43	-64.64	
9,854.00	11.20	228.45	9,772.72	554.76 S	644.39 W	503,959.64	725,876.91	2.28	-486.65	-64.43	
9,856.00	11.22	228.24	9,774.68	555.02 S	644.68 W	503,959.38	725,876.62	2.28	-486.88	-64.22	
9,858.00	11.24	228.03	9,776.64	555.28 S	644.97 W	503,959.12	725,876.33	2.28	-487.11	-64.02	
9,860.00	11.26	227.82	9,778.60	555.54 S	645.26 W	503,958.86	725,876.04	2.28	-487.34	-63.81	
9,862.00	11.28	227.61	9,780.56	555.80 S	645.55 W	503,958.60	725,875.75	2.28	-487.57	-63.60	
9,864.00	11.30	227.40	9,782.52	556.06 S	645.84 W	503,958.34	725,875.46	2.28	-487.81	-63.40	
9,866.00	11.33	227.19	9,784.49	556.33 S	646.13 W	503,958.07	725,875.17	2.28	-488.04	-63.20	
9,868.00	11.35	226.99	9,786.45	556.60 S	646.41 W	503,957.80	725,874.89	2.28	-488.28	-62.99	
9,870.00	11.37	226.78	9,788.41	556.87 S	646.70 W	503,957.53	725,874.60	2.28	-488.52	-62.79	
9,872.00	11.39	226.58	9,790.37	557.14 S	646.99 W	503,957.26	725,874.31	2.28	-488.76	-62.59	
9,874.00	11.41	226.37	9,792.33	557.41 S	647.28 W	503,956.99	725,874.02	2.28	-489.00	-62.39	
9,876.00	11.43	226.17	9,794.29	557.68 S	647.56 W	503,956.72	725,873.74	2.28	-489.24	-62.19	
9,878.00	11.45	225.97	9,796.25	557.96 S	647.85 W	503,956.44	725,873.45	2.28	-489.49	-61.99	
9,880.00	11.47	225.76	9,798.21	558.24 S	648.13 W	503,956.16	725,873.17	2.28	-489.73	-61.79	
9,882.00	11.50	225.56	9,800.17	558.51 S	648.42 W	503,955.89	725,872.88	2.28	-489.98	-61.59	
9,884.00	11.52	225.36	9,802.13	558.79 S	648.70 W	503,955.61	725,872.60	2.28	-490.23	-61.39	
9,886.00	11.54	225.16	9,804.09	559.08 S	648.99 W	503,955.32	725,872.31	2.28	-490.48	-61.20	
9,888.00	11.56	224.96	9,806.05	559.36 S	649.27 W	503,955.04	725,872.03	2.28	-490.74	-61.00	
9,890.00	11.58	224.77	9,808.01	559.64 S	649.55 W	503,954.76	725,871.75	2.28	-490.99	-60.81	
9,892.00	11.61	224.57	9,809.97	559.93 S	649.83 W	503,954.47	725,871.47	2.28	-491.25	-60.61	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
9,894.00	11.63	224.37	9,811.93	560.22 S	650.12 W	503,954.18	725,871.18	2.28	-491.50	-60.42	
9,896.00	11.65	224.18	9,813.88	560.50 S	650.40 W	503,953.90	725,870.90	2.28	-491.76	-60.23	
9,898.00	11.67	223.98	9,815.84	560.80 S	650.68 W	503,953.60	725,870.62	2.28	-492.02	-60.03	
9,900.00	11.70	223.79	9,817.80	561.09 S	650.96 W	503,953.31	725,870.34	2.28	-492.28	-59.84	
9,902.00	11.72	223.59	9,819.76	561.38 S	651.24 W	503,953.02	725,870.06	2.28	-492.55	-59.65	
9,904.00	11.74	223.40	9,821.72	561.68 S	651.52 W	503,952.72	725,869.78	2.28	-492.81	-59.46	
9,906.00	11.77	223.21	9,823.68	561.97 S	651.80 W	503,952.43	725,869.50	2.28	-493.08	-59.27	
9,908.00	11.79	223.02	9,825.63	562.27 S	652.08 W	503,952.13	725,869.22	2.28	-493.35	-59.08	
9,910.00	11.81	222.82	9,827.59	562.57 S	652.36 W	503,951.83	725,868.94	2.28	-493.62	-58.90	
9,912.00	11.84	222.63	9,829.55	562.87 S	652.64 W	503,951.53	725,868.66	2.28	-493.89	-58.71	
9,914.00	11.85	222.59	9,831.51	563.17 S	652.91 W	503,951.23	725,868.39	0.75	-494.16	-42.93	
9,916.00	11.85	222.68	9,833.46	563.48 S	653.19 W	503,950.92	725,868.11	0.93	-494.43	95.95	
9,918.00	11.85	222.77	9,835.42	563.78 S	653.47 W	503,950.62	725,867.83	0.93	-494.71	95.86	
9,920.00	11.84	222.86	9,837.38	564.08 S	653.75 W	503,950.32	725,867.55	0.93	-494.98	95.77	
9,922.00	11.84	222.95	9,839.34	564.38 S	654.03 W	503,950.02	725,867.27	0.93	-495.25	95.69	
9,924.00	11.84	223.04	9,841.29	564.68 S	654.31 W	503,949.72	725,866.99	0.93	-495.52	95.60	
9,926.00	11.84	223.13	9,843.25	564.98 S	654.59 W	503,949.42	725,866.71	0.93	-495.79	95.51	
9,928.00	11.84	223.22	9,845.21	565.28 S	654.87 W	503,949.12	725,866.43	0.93	-496.06	95.42	
9,930.00	11.83	223.31	9,847.17	565.58 S	655.15 W	503,948.82	725,866.15	0.93	-496.33	95.33	
9,932.00	11.83	223.40	9,849.12	565.87 S	655.43 W	503,948.53	725,865.87	0.93	-496.59	95.24	
9,934.00	11.83	223.49	9,851.08	566.17 S	655.71 W	503,948.23	725,865.59	0.93	-496.86	95.16	
9,936.00	11.83	223.58	9,853.04	566.47 S	656.00 W	503,947.93	725,865.30	0.93	-497.13	95.07	
9,938.00	11.83	223.67	9,855.00	566.77 S	656.28 W	503,947.63	725,865.02	0.93	-497.40	94.98	
9,940.00	11.83	223.76	9,856.95	567.06 S	656.56 W	503,947.34	725,864.74	0.93	-497.66	94.89	
9,942.00	11.82	223.85	9,858.91	567.36 S	656.85 W	503,947.04	725,864.45	0.93	-497.93	94.80	
9,944.00	11.82	223.94	9,860.87	567.65 S	657.13 W	503,946.75	725,864.17	0.93	-498.19	94.71	
9,946.00	11.82	224.03	9,862.83	567.95 S	657.42 W	503,946.45	725,863.88	0.93	-498.46	94.62	
9,948.00	11.82	224.12	9,864.78	568.24 S	657.70 W	503,946.16	725,863.60	0.93	-498.72	94.54	
9,950.00	11.82	224.21	9,866.74	568.54 S	657.99 W	503,945.86	725,863.31	0.93	-498.98	94.45	
9,952.00	11.82	224.30	9,868.70	568.83 S	658.27 W	503,945.57	725,863.03	0.93	-499.25	94.36	
9,954.00	11.82	224.39	9,870.66	569.12 S	658.56 W	503,945.28	725,862.74	0.93	-499.51	94.27	
9,956.00	11.81	224.49	9,872.61	569.42 S	658.84 W	503,944.98	725,862.46	0.93	-499.77	94.18	
9,958.00	11.81	224.58	9,874.57	569.71 S	659.13 W	503,944.69	725,862.17	0.93	-500.03	94.09	
9,960.00	11.81	224.67	9,876.53	570.00 S	659.42 W	503,944.40	725,861.88	0.93	-500.29	94.00	
9,962.00	11.81	224.76	9,878.49	570.29 S	659.71 W	503,944.11	725,861.59	0.93	-500.55	93.91	
9,964.00	11.81	224.85	9,880.45	570.58 S	660.00 W	503,943.82	725,861.30	0.93	-500.81	93.82	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
9,966.00	11.81	224.94	9,882.40	570.87 S	660.28 W	503,943.53	725,861.02	0.93	-501.07	93.74	
9,968.00	11.81	225.03	9,884.36	571.16 S	660.57 W	503,943.24	725,860.73	0.93	-501.33	93.65	
9,970.00	11.81	225.12	9,886.32	571.45 S	660.86 W	503,942.95	725,860.44	0.93	-501.59	93.56	
9,972.00	11.81	225.21	9,888.28	571.74 S	661.15 W	503,942.66	725,860.15	0.93	-501.85	93.47	
9,974.00	11.80	225.30	9,890.23	572.03 S	661.44 W	503,942.37	725,859.86	0.93	-502.10	93.38	
9,976.00	11.80	225.39	9,892.19	572.31 S	661.74 W	503,942.09	725,859.56	0.93	-502.36	93.29	
9,978.00	11.80	225.48	9,894.15	572.60 S	662.03 W	503,941.80	725,859.27	0.93	-502.62	93.20	
9,980.00	11.80	225.58	9,896.11	572.89 S	662.32 W	503,941.51	725,858.98	0.93	-502.87	93.11	
9,982.00	11.80	225.67	9,898.06	573.17 S	662.61 W	503,941.23	725,858.69	0.93	-503.13	93.02	
9,984.00	11.80	225.76	9,900.02	573.46 S	662.90 W	503,940.94	725,858.40	0.93	-503.38	92.94	
9,986.00	11.80	225.85	9,901.98	573.74 S	663.20 W	503,940.66	725,858.10	0.93	-503.64	92.85	
9,988.00	11.80	225.94	9,903.94	574.03 S	663.49 W	503,940.37	725,857.81	0.93	-503.89	92.76	
9,990.00	11.80	226.03	9,905.90	574.31 S	663.78 W	503,940.09	725,857.52	0.93	-504.14	92.67	
9,992.00	11.80	226.12	9,907.85	574.60 S	664.08 W	503,939.80	725,857.22	0.93	-504.39	92.58	
9,994.00	11.79	226.21	9,909.81	574.88 S	664.37 W	503,939.52	725,856.93	0.93	-504.65	92.49	
9,996.00	11.79	226.30	9,911.77	575.16 S	664.67 W	503,939.24	725,856.63	0.93	-504.90	92.40	
9,998.00	11.79	226.39	9,913.73	575.44 S	664.97 W	503,938.96	725,856.33	0.93	-505.15	92.31	
10,000.00	11.79	226.49	9,915.68	575.73 S	665.26 W	503,938.67	725,856.04	0.93	-505.40	92.22	
10,002.00	11.79	226.58	9,917.64	576.01 S	665.56 W	503,938.39	725,855.74	0.93	-505.65	92.13	
10,004.00	11.79	226.67	9,919.60	576.29 S	665.86 W	503,938.11	725,855.44	0.93	-505.90	92.04	
10,006.00	11.79	226.76	9,921.56	576.57 S	666.15 W	503,937.83	725,855.15	0.93	-506.15	91.96	
10,008.00	11.79	226.85	9,923.52	576.85 S	666.45 W	503,937.55	725,854.85	0.93	-506.39	91.87	
10,010.00	11.78	226.89	9,925.47	577.13 S	666.75 W	503,937.27	725,854.55	0.79	-506.64	149.74	
10,012.00	11.76	226.93	9,927.43	577.40 S	667.05 W	503,937.00	725,854.25	0.79	-506.89	149.70	
10,014.00	11.75	226.97	9,929.39	577.68 S	667.34 W	503,936.72	725,853.96	0.79	-507.14	149.67	
10,016.00	11.74	227.01	9,931.35	577.96 S	667.64 W	503,936.44	725,853.66	0.79	-507.38	149.63	
10,018.00	11.72	227.05	9,933.31	578.24 S	667.94 W	503,936.16	725,853.36	0.79	-507.63	149.59	
10,020.00	11.71	227.08	9,935.26	578.51 S	668.24 W	503,935.89	725,853.06	0.79	-507.87	149.55	
10,022.00	11.69	227.12	9,937.22	578.79 S	668.53 W	503,935.61	725,852.77	0.79	-508.12	149.51	
10,024.00	11.68	227.16	9,939.18	579.07 S	668.83 W	503,935.33	725,852.47	0.79	-508.36	149.47	
10,026.00	11.67	227.20	9,941.14	579.34 S	669.13 W	503,935.06	725,852.17	0.79	-508.60	149.43	
10,028.00	11.65	227.24	9,943.10	579.62 S	669.42 W	503,934.78	725,851.88	0.79	-508.85	149.40	
10,030.00	11.64	227.28	9,945.06	579.89 S	669.72 W	503,934.51	725,851.58	0.79	-509.09	149.36	
10,032.00	11.63	227.32	9,947.02	580.16 S	670.02 W	503,934.24	725,851.28	0.79	-509.33	149.32	
10,034.00	11.61	227.36	9,948.98	580.44 S	670.31 W	503,933.96	725,850.99	0.79	-509.57	149.28	
10,036.00	11.60	227.40	9,950.93	580.71 S	670.61 W	503,933.69	725,850.69	0.79	-509.81	149.24	
10,038.00	11.59	227.44	9,952.89	580.98 S	670.91 W	503,933.42	725,850.39	0.79	-510.06	149.20	



Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
10,040.00	11.57	227.48	9,954.85	581.25 S	671.20 W	503,933.15	725,850.10	0.79	-510.30	149.16	
10,042.00	11.56	227.52	9,956.81	581.52 S	671.50 W	503,932.88	725,849.80	0.79	-510.53	149.12	
10,044.00	11.55	227.56	9,958.77	581.79 S	671.79 W	503,932.61	725,849.51	0.79	-510.77	149.08	
10,046.00	11.53	227.60	9,960.73	582.06 S	672.09 W	503,932.34	725,849.21	0.79	-511.01	149.04	
10,048.00	11.52	227.64	9,962.69	582.33 S	672.38 W	503,932.07	725,848.92	0.79	-511.25	149.00	
10,050.00	11.51	227.69	9,964.65	582.60 S	672.68 W	503,931.80	725,848.62	0.79	-511.49	148.96	
10,052.00	11.49	227.73	9,966.61	582.87 S	672.97 W	503,931.53	725,848.33	0.79	-511.73	148.92	
10,054.00	11.48	227.77	9,968.57	583.14 S	673.27 W	503,931.26	725,848.03	0.79	-511.96	148.88	
10,056.00	11.47	227.81	9,970.53	583.40 S	673.56 W	503,931.00	725,847.74	0.79	-512.20	148.84	
10,058.00	11.45	227.85	9,972.49	583.67 S	673.86 W	503,930.73	725,847.44	0.79	-512.43	148.80	
10,060.00	11.44	227.89	9,974.45	583.94 S	674.15 W	503,930.46	725,847.15	0.79	-512.67	148.76	
10,062.00	11.42	227.93	9,976.41	584.20 S	674.45 W	503,930.20	725,846.85	0.79	-512.90	148.72	
10,064.00	11.41	227.97	9,978.37	584.47 S	674.74 W	503,929.93	725,846.56	0.79	-513.14	148.68	
10,066.00	11.40	228.01	9,980.33	584.73 S	675.03 W	503,929.67	725,846.27	0.79	-513.37	148.64	
10,068.00	11.38	228.06	9,982.29	585.00 S	675.33 W	503,929.40	725,845.97	0.79	-513.60	148.60	
10,070.00	11.37	228.10	9,984.25	585.26 S	675.62 W	503,929.14	725,845.68	0.79	-513.84	148.56	
10,072.00	11.36	228.14	9,986.21	585.52 S	675.91 W	503,928.88	725,845.39	0.79	-514.07	148.52	
10,074.00	11.34	228.18	9,988.18	585.79 S	676.21 W	503,928.61	725,845.09	0.79	-514.30	148.48	
10,076.00	11.33	228.22	9,990.14	586.05 S	676.50 W	503,928.35	725,844.80	0.79	-514.53	148.44	
10,078.00	11.32	228.27	9,992.10	586.31 S	676.79 W	503,928.09	725,844.51	0.79	-514.76	148.40	
10,080.00	11.30	228.31	9,994.06	586.57 S	677.09 W	503,927.83	725,844.21	0.79	-514.99	148.35	
10,082.00	11.29	228.35	9,996.02	586.83 S	677.38 W	503,927.57	725,843.92	0.79	-515.22	148.31	
10,084.00	11.28	228.39	9,997.98	587.09 S	677.67 W	503,927.31	725,843.63	0.79	-515.45	148.27	
10,086.00	11.26	228.44	9,999.94	587.35 S	677.96 W	503,927.05	725,843.34	0.79	-515.68	148.23	
10,088.00	11.25	228.48	10,001.90	587.61 S	678.26 W	503,926.79	725,843.04	0.79	-515.91	148.19	
10,090.00	11.24	228.52	10,003.87	587.87 S	678.55 W	503,926.53	725,842.75	0.79	-516.13	148.15	
10,092.00	11.22	228.56	10,005.83	588.13 S	678.84 W	503,926.27	725,842.46	0.79	-516.36	148.11	
10,094.00	11.21	228.61	10,007.79	588.38 S	679.13 W	503,926.02	725,842.17	0.79	-516.59	148.06	
10,096.00	11.20	228.65	10,009.75	588.64 S	679.42 W	503,925.76	725,841.88	0.79	-516.81	148.02	
10,098.00	11.18	228.69	10,011.71	588.90 S	679.71 W	503,925.50	725,841.59	0.79	-517.04	147.98	
10,100.00	11.17	228.74	10,013.67	589.15 S	680.01 W	503,925.25	725,841.29	0.79	-517.26	147.94	
10,102.00	11.16	228.78	10,015.64	589.41 S	680.30 W	503,924.99	725,841.00	0.79	-517.49	147.89	
10,104.00	11.15	228.77	10,017.60	589.66 S	680.59 W	503,924.74	725,840.71	0.56	-517.71	-166.92	
10,106.00	11.14	228.70	10,019.56	589.92 S	680.88 W	503,924.48	725,840.42	0.80	-517.94	-122.53	
10,108.00	11.13	228.63	10,021.52	590.17 S	681.17 W	503,924.23	725,840.13	0.80	-518.16	-122.47	
10,110.00	11.12	228.56	10,023.49	590.43 S	681.46 W	503,923.97	725,839.84	0.80	-518.39	-122.40	
10,112.00	11.11	228.49	10,025.45	590.68 S	681.75 W	503,923.72	725,839.55	0.80	-518.61	-122.33	

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Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
10,114.00	11.10	228.42	10,027.41	590.94 S	682.04 W	503,923.46	725,839.26	0.80	-518.84	-122.26	
10,116.00	11.09	228.34	10,029.37	591.19 S	682.32 W	503,923.21	725,838.98	0.80	-519.06	-122.19	
10,118.00	11.09	228.27	10,031.34	591.45 S	682.61 W	503,922.95	725,838.69	0.80	-519.29	-122.12	
10,120.00	11.08	228.20	10,033.30	591.71 S	682.90 W	503,922.69	725,838.40	0.80	-519.51	-122.05	
10,122.00	11.07	228.13	10,035.26	591.96 S	683.18 W	503,922.44	725,838.12	0.80	-519.74	-121.98	
10,124.00	11.06	228.06	10,037.22	592.22 S	683.47 W	503,922.18	725,837.83	0.80	-519.96	-121.91	
10,126.00	11.05	227.99	10,039.19	592.48 S	683.75 W	503,921.92	725,837.55	0.80	-520.19	-121.85	
10,128.00	11.04	227.92	10,041.15	592.73 S	684.04 W	503,921.67	725,837.26	0.80	-520.42	-121.78	
10,130.00	11.04	227.85	10,043.11	592.99 S	684.32 W	503,921.41	725,836.98	0.80	-520.64	-121.71	
10,132.00	11.03	227.78	10,045.08	593.25 S	684.61 W	503,921.15	725,836.69	0.80	-520.87	-121.64	
10,134.00	11.02	227.71	10,047.04	593.50 S	684.89 W	503,920.90	725,836.41	0.80	-521.10	-121.57	
10,136.00	11.01	227.64	10,049.00	593.76 S	685.17 W	503,920.64	725,836.13	0.80	-521.32	-121.50	
10,138.00	11.00	227.56	10,050.97	594.02 S	685.45 W	503,920.38	725,835.85	0.80	-521.55	-121.43	
10,140.00	10.99	227.49	10,052.93	594.28 S	685.74 W	503,920.12	725,835.56	0.80	-521.78	-121.36	
10,142.00	10.99	227.42	10,054.89	594.53 S	686.02 W	503,919.87	725,835.28	0.80	-522.01	-121.29	
10,144.00	10.98	227.35	10,056.86	594.79 S	686.30 W	503,919.61	725,835.00	0.80	-522.24	-121.22	
10,146.00	10.97	227.28	10,058.82	595.05 S	686.58 W	503,919.35	725,834.72	0.80	-522.46	-121.15	
10,148.00	10.96	227.21	10,060.78	595.31 S	686.86 W	503,919.09	725,834.44	0.80	-522.69	-121.07	
10,150.00	10.95	227.13	10,062.75	595.57 S	687.13 W	503,918.83	725,834.17	0.80	-522.92	-121.00	
10,152.00	10.94	227.06	10,064.71	595.82 S	687.41 W	503,918.58	725,833.89	0.80	-523.15	-120.93	
10,154.00	10.94	226.99	10,066.67	596.08 S	687.69 W	503,918.32	725,833.61	0.80	-523.38	-120.86	
10,156.00	10.93	226.92	10,068.64	596.34 S	687.97 W	503,918.06	725,833.33	0.80	-523.61	-120.79	
10,158.00	10.92	226.84	10,070.60	596.60 S	688.24 W	503,917.80	725,833.06	0.80	-523.84	-120.72	
10,160.00	10.91	226.77	10,072.57	596.86 S	688.52 W	503,917.54	725,832.78	0.80	-524.07	-120.65	
10,162.00	10.90	226.70	10,074.53	597.12 S	688.80 W	503,917.28	725,832.50	0.80	-524.30	-120.58	
10,164.00	10.90	226.63	10,076.49	597.38 S	689.07 W	503,917.02	725,832.23	0.80	-524.53	-120.51	
10,166.00	10.89	226.55	10,078.46	597.64 S	689.35 W	503,916.76	725,831.95	0.80	-524.76	-120.43	
10,168.00	10.88	226.48	10,080.42	597.90 S	689.62 W	503,916.50	725,831.68	0.80	-524.99	-120.36	
10,170.00	10.87	226.41	10,082.39	598.16 S	689.89 W	503,916.24	725,831.41	0.80	-525.22	-120.29	
10,172.00	10.86	226.33	10,084.35	598.42 S	690.17 W	503,915.98	725,831.13	0.80	-525.45	-120.22	
10,174.00	10.85	226.26	10,086.31	598.68 S	690.44 W	503,915.72	725,830.86	0.80	-525.69	-120.15	
10,176.00	10.85	226.19	10,088.28	598.94 S	690.71 W	503,915.46	725,830.59	0.80	-525.92	-120.07	
10,178.00	10.84	226.11	10,090.24	599.20 S	690.98 W	503,915.20	725,830.32	0.80	-526.15	-120.00	
10,180.00	10.83	226.04	10,092.21	599.46 S	691.25 W	503,914.94	725,830.05	0.80	-526.38	-119.93	
10,182.00	10.82	225.96	10,094.17	599.72 S	691.52 W	503,914.68	725,829.78	0.80	-526.61	-119.86	
10,184.00	10.82	225.89	10,096.14	599.98 S	691.79 W	503,914.42	725,829.51	0.80	-526.85	-119.79	

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Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
10,186.00	10.81	225.82	10,098.10	600.24 S	692.06 W	503,914.16	725,829.24	0.80	-527.08	-119.71	
10,188.00	10.80	225.74	10,100.06	600.51 S	692.33 W	503,913.89	725,828.97	0.80	-527.31	-119.64	
10,190.00	10.79	225.67	10,102.03	600.77 S	692.60 W	503,913.63	725,828.70	0.80	-527.54	-119.57	
10,192.00	10.78	225.59	10,103.99	601.03 S	692.87 W	503,913.37	725,828.43	0.80	-527.78	-119.49	
10,194.00	10.78	225.52	10,105.96	601.29 S	693.13 W	503,913.11	725,828.17	0.80	-528.01	-119.42	
10,196.00	10.77	225.44	10,107.92	601.55 S	693.40 W	503,912.85	725,827.90	0.80	-528.24	-119.35	
10,198.00	10.76	225.37	10,109.89	601.82 S	693.67 W	503,912.58	725,827.63	0.80	-528.48	-119.27	
10,200.00	10.77	225.38	10,111.85	602.08 S	693.93 W	503,912.32	725,827.37	0.51	-528.71	6.03	
10,202.00	10.78	225.38	10,113.82	602.34 S	694.20 W	503,912.06	725,827.10	0.51	-528.95	6.02	
10,204.00	10.79	225.39	10,115.78	602.60 S	694.46 W	503,911.80	725,826.84	0.51	-529.18	6.02	
10,206.00	10.80	225.39	10,117.75	602.87 S	694.73 W	503,911.53	725,826.57	0.51	-529.42	6.01	
10,208.00	10.81	225.40	10,119.71	603.13 S	695.00 W	503,911.27	725,826.30	0.51	-529.65	6.01	
10,210.00	10.82	225.40	10,121.68	603.39 S	695.26 W	503,911.01	725,826.04	0.51	-529.89	6.00	
10,212.00	10.83	225.41	10,123.64	603.66 S	695.53 W	503,910.74	725,825.77	0.51	-530.12	5.99	
10,214.00	10.84	225.42	10,125.60	603.92 S	695.80 W	503,910.48	725,825.50	0.51	-530.36	5.99	
10,216.00	10.85	225.42	10,127.57	604.19 S	696.07 W	503,910.21	725,825.23	0.51	-530.59	5.98	
10,218.00	10.86	225.43	10,129.53	604.45 S	696.34 W	503,909.95	725,824.96	0.51	-530.83	5.98	
10,220.00	10.87	225.43	10,131.50	604.71 S	696.60 W	503,909.69	725,824.70	0.51	-531.06	5.97	
10,222.00	10.88	225.44	10,133.46	604.98 S	696.87 W	503,909.42	725,824.43	0.51	-531.30	5.97	
10,224.00	10.89	225.44	10,135.42	605.24 S	697.14 W	503,909.16	725,824.16	0.51	-531.54	5.96	
10,226.00	10.90	225.45	10,137.39	605.51 S	697.41 W	503,908.89	725,823.89	0.51	-531.77	5.96	
10,228.00	10.91	225.46	10,139.35	605.78 S	697.68 W	503,908.62	725,823.62	0.51	-532.01	5.95	
10,230.00	10.92	225.46	10,141.32	606.04 S	697.95 W	503,908.36	725,823.35	0.51	-532.25	5.94	
10,232.00	10.93	225.47	10,143.28	606.31 S	698.22 W	503,908.09	725,823.08	0.51	-532.49	5.94	
10,234.00	10.94	225.47	10,145.24	606.57 S	698.49 W	503,907.83	725,822.81	0.51	-532.72	5.93	
10,236.00	10.95	225.48	10,147.21	606.84 S	698.76 W	503,907.56	725,822.54	0.51	-532.96	5.93	
10,238.00	10.96	225.48	10,149.17	607.11 S	699.03 W	503,907.29	725,822.27	0.51	-533.20	5.92	
10,240.00	10.97	225.49	10,151.13	607.37 S	699.31 W	503,907.03	725,821.99	0.51	-533.44	5.92	
10,242.00	10.98	225.49	10,153.10	607.64 S	699.58 W	503,906.76	725,821.72	0.51	-533.67	5.91	
10,244.00	10.99	225.50	10,155.06	607.91 S	699.85 W	503,906.49	725,821.45	0.51	-533.91	5.91	
10,246.00	11.01	225.51	10,157.02	608.17 S	700.12 W	503,906.23	725,821.18	0.51	-534.15	5.90	
10,248.00	11.02	225.51	10,158.99	608.44 S	700.39 W	503,905.96	725,820.91	0.51	-534.39	5.90	
10,250.00	11.03	225.52	10,160.95	608.71 S	700.67 W	503,905.69	725,820.63	0.51	-534.63	5.89	
10,252.00	11.04	225.52	10,162.91	608.98 S	700.94 W	503,905.42	725,820.36	0.51	-534.87	5.88	
10,254.00	11.05	225.53	10,164.88	609.25 S	701.21 W	503,905.15	725,820.09	0.51	-535.11	5.88	
10,256.00	11.06	225.53	10,166.84	609.51 S	701.49 W	503,904.89	725,819.81	0.51	-535.35	5.87	
10,258.00	11.07	225.54	10,168.80	609.78 S	701.76 W	503,904.62	725,819.54	0.51	-535.59	5.87	

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				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
10,260.00	11.08	225.54	10,170.77	610.05 S	702.04 W	503,904.35	725,819.26	0.51	-535.83	5.86	
10,262.00	11.09	225.55	10,172.73	610.32 S	702.31 W	503,904.08	725,818.99	0.51	-536.07	5.86	
10,264.00	11.10	225.55	10,174.69	610.59 S	702.58 W	503,903.81	725,818.72	0.51	-536.31	5.85	
10,266.00	11.11	225.56	10,176.65	610.86 S	702.86 W	503,903.54	725,818.44	0.51	-536.55	5.85	
10,268.00	11.12	225.57	10,178.62	611.13 S	703.13 W	503,903.27	725,818.17	0.51	-536.79	5.84	
10,270.00	11.13	225.57	10,180.58	611.40 S	703.41 W	503,903.00	725,817.89	0.51	-537.03	5.84	
10,272.00	11.14	225.58	10,182.54	611.67 S	703.69 W	503,902.73	725,817.61	0.51	-537.27	5.83	
10,274.00	11.15	225.58	10,184.50	611.94 S	703.96 W	503,902.46	725,817.34	0.51	-537.51	5.83	
10,276.00	11.16	225.59	10,186.47	612.21 S	704.24 W	503,902.19	725,817.06	0.51	-537.75	5.82	
10,278.00	11.17	225.59	10,188.43	612.48 S	704.51 W	503,901.92	725,816.79	0.51	-537.99	5.82	
10,280.00	11.18	225.60	10,190.39	612.75 S	704.79 W	503,901.65	725,816.51	0.51	-538.23	5.81	
10,282.00	11.19	225.60	10,192.35	613.03 S	705.07 W	503,901.37	725,816.23	0.51	-538.48	5.80	
10,284.00	11.20	225.61	10,194.31	613.30 S	705.35 W	503,901.10	725,815.95	0.51	-538.72	5.80	
10,286.00	11.21	225.61	10,196.28	613.57 S	705.62 W	503,900.83	725,815.68	0.51	-538.96	5.79	
10,288.00	11.22	225.62	10,198.24	613.84 S	705.90 W	503,900.56	725,815.40	0.51	-539.20	5.79	
10,290.00	11.23	225.62	10,200.20	614.11 S	706.18 W	503,900.29	725,815.12	0.51	-539.45	5.78	
10,292.00	11.24	225.63	10,202.16	614.39 S	706.46 W	503,900.01	725,814.84	0.51	-539.69	5.78	
10,294.00	11.25	225.61	10,204.12	614.66 S	706.74 W	503,899.74	725,814.56	0.58	-539.93	-22.82	
10,296.00	11.26	225.58	10,206.08	614.93 S	707.02 W	503,899.47	725,814.28	0.58	-540.18	-22.80	
10,298.00	11.27	225.56	10,208.04	615.21 S	707.30 W	503,899.19	725,814.00	0.58	-540.42	-22.78	
10,300.00	11.28	225.54	10,210.01	615.48 S	707.57 W	503,898.92	725,813.73	0.58	-540.66	-22.76	
10,302.00	11.29	225.52	10,211.97	615.75 S	707.85 W	503,898.65	725,813.45	0.58	-540.91	-22.73	
10,304.00	11.30	225.49	10,213.93	616.03 S	708.13 W	503,898.37	725,813.17	0.58	-541.15	-22.71	
10,306.00	11.31	225.47	10,215.89	616.30 S	708.41 W	503,898.10	725,812.89	0.58	-541.40	-22.69	
10,308.00	11.33	225.45	10,217.85	616.58 S	708.69 W	503,897.82	725,812.61	0.58	-541.64	-22.67	
10,310.00	11.34	225.42	10,219.81	616.85 S	708.97 W	503,897.55	725,812.33	0.58	-541.89	-22.64	
10,312.00	11.35	225.40	10,221.77	617.13 S	709.25 W	503,897.27	725,812.05	0.58	-542.14	-22.62	
10,314.00	11.36	225.38	10,223.73	617.41 S	709.53 W	503,896.99	725,811.77	0.58	-542.38	-22.60	
10,316.00	11.37	225.36	10,225.69	617.68 S	709.81 W	503,896.72	725,811.49	0.58	-542.63	-22.58	
10,318.00	11.38	225.33	10,227.66	617.96 S	710.09 W	503,896.44	725,811.21	0.58	-542.88	-22.55	
10,320.00	11.39	225.31	10,229.62	618.24 S	710.37 W	503,896.16	725,810.93	0.58	-543.13	-22.53	
10,322.00	11.40	225.29	10,231.58	618.52 S	710.66 W	503,895.88	725,810.64	0.58	-543.37	-22.51	
10,324.00	11.41	225.27	10,233.54	618.80 S	710.94 W	503,895.60	725,810.36	0.58	-543.62	-22.49	
10,326.00	11.42	225.24	10,235.50	619.07 S	711.22 W	503,895.33	725,810.08	0.58	-543.87	-22.47	
10,328.00	11.43	225.22	10,237.46	619.35 S	711.50 W	503,895.05	725,809.80	0.58	-544.12	-22.44	
10,330.00	11.44	225.20	10,239.42	619.63 S	711.78 W	503,894.77	725,809.52	0.58	-544.37	-22.42	
10,332.00	11.45	225.18	10,241.38	619.91 S	712.06 W	503,894.49	725,809.24	0.58	-544.62	-22.40	

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				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
10,334.00	11.47	225.15	10,243.34	620.19 S	712.34 W	503,894.21	725,808.96	0.58	-544.87	-22.38	
10,336.00	11.48	225.13	10,245.30	620.47 S	712.63 W	503,893.93	725,808.67	0.58	-545.12	-22.36	
10,338.00	11.49	225.11	10,247.26	620.75 S	712.91 W	503,893.65	725,808.39	0.58	-545.37	-22.33	
10,340.00	11.50	225.09	10,249.22	621.04 S	713.19 W	503,893.36	725,808.11	0.58	-545.62	-22.31	
10,342.00	11.51	225.07	10,251.18	621.32 S	713.47 W	503,893.08	725,807.83	0.58	-545.87	-22.29	
10,344.00	11.52	225.04	10,253.14	621.60 S	713.76 W	503,892.80	725,807.54	0.58	-546.13	-22.27	
10,346.00	11.53	225.02	10,255.10	621.88 S	714.04 W	503,892.52	725,807.26	0.58	-546.38	-22.25	
10,348.00	11.54	225.00	10,257.06	622.16 S	714.32 W	503,892.24	725,806.98	0.58	-546.63	-22.23	
10,350.00	11.55	224.98	10,259.02	622.45 S	714.60 W	503,891.95	725,806.70	0.58	-546.88	-22.21	
10,352.00	11.56	224.96	10,260.98	622.73 S	714.89 W	503,891.67	725,806.41	0.58	-547.14	-22.18	
10,354.00	11.57	224.93	10,262.94	623.01 S	715.17 W	503,891.39	725,806.13	0.58	-547.39	-22.16	
10,356.00	11.58	224.91	10,264.90	623.30 S	715.45 W	503,891.10	725,805.85	0.58	-547.64	-22.14	
10,358.00	11.59	224.89	10,266.85	623.58 S	715.74 W	503,890.82	725,805.56	0.58	-547.90	-22.12	
10,360.00	11.60	224.87	10,268.81	623.87 S	716.02 W	503,890.53	725,805.28	0.58	-548.15	-22.10	
10,362.00	11.62	224.85	10,270.77	624.15 S	716.31 W	503,890.25	725,804.99	0.58	-548.41	-22.08	
10,364.00	11.63	224.83	10,272.73	624.44 S	716.59 W	503,889.96	725,804.71	0.58	-548.66	-22.06	
10,366.00	11.64	224.80	10,274.69	624.73 S	716.87 W	503,889.67	725,804.43	0.58	-548.92	-22.03	
10,368.00	11.65	224.78	10,276.65	625.01 S	717.16 W	503,889.39	725,804.14	0.58	-549.18	-22.01	
10,370.00	11.66	224.76	10,278.61	625.30 S	717.44 W	503,889.10	725,803.86	0.58	-549.43	-21.99	
10,372.00	11.67	224.74	10,280.57	625.59 S	717.73 W	503,888.81	725,803.57	0.58	-549.69	-21.97	
10,374.00	11.68	224.72	10,282.53	625.87 S	718.01 W	503,888.53	725,803.29	0.58	-549.95	-21.95	
10,376.00	11.69	224.70	10,284.48	626.16 S	718.30 W	503,888.24	725,803.00	0.58	-550.20	-21.93	
10,378.00	11.70	224.68	10,286.44	626.45 S	718.58 W	503,887.95	725,802.72	0.58	-550.46	-21.91	
10,380.00	11.71	224.65	10,288.40	626.74 S	718.87 W	503,887.66	725,802.43	0.58	-550.72	-21.89	
10,382.00	11.72	224.63	10,290.36	627.03 S	719.15 W	503,887.37	725,802.15	0.58	-550.98	-21.87	
10,384.00	11.73	224.61	10,292.32	627.32 S	719.44 W	503,887.08	725,801.86	0.58	-551.24	-21.85	
10,386.00	11.74	224.59	10,294.28	627.61 S	719.72 W	503,886.79	725,801.58	0.58	-551.50	-21.82	
10,388.00	11.76	224.57	10,296.23	627.90 S	720.01 W	503,886.50	725,801.29	0.69	-551.76	-14.85	
10,390.00	11.77	224.56	10,298.19	628.19 S	720.30 W	503,886.21	725,801.00	0.81	-552.02	-9.86	
10,392.00	11.79	224.55	10,300.15	628.48 S	720.58 W	503,885.92	725,800.72	0.81	-552.28	-9.85	
10,394.00	11.81	224.53	10,302.11	628.77 S	720.87 W	503,885.63	725,800.43	0.81	-552.54	-9.84	
10,396.00	11.82	224.52	10,304.06	629.06 S	721.16 W	503,885.34	725,800.14	0.81	-552.80	-9.83	
10,398.00	11.84	224.51	10,306.02	629.35 S	721.44 W	503,885.05	725,799.86	0.81	-553.06	-9.81	
10,400.00	11.85	224.49	10,307.98	629.65 S	721.73 W	503,884.75	725,799.57	0.81	-553.32	-9.80	
10,402.00	11.87	224.48	10,309.94	629.94 S	722.02 W	503,884.46	725,799.28	0.81	-553.59	-9.79	
10,404.00	11.89	224.47	10,311.89	630.23 S	722.31 W	503,884.17	725,798.99	0.81	-553.85	-9.77	



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Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
10,406.00	11.90	224.45	10,313.85	630.53 S	722.60 W	503,883.87	725,798.70	0.81	-554.11	-9.76	
10,408.00	11.92	224.44	10,315.81	630.82 S	722.89 W	503,883.58	725,798.41	0.81	-554.38	-9.75	
10,410.00	11.93	224.43	10,317.77	631.12 S	723.18 W	503,883.28	725,798.12	0.81	-554.64	-9.73	
10,412.00	11.95	224.41	10,319.72	631.41 S	723.46 W	503,882.99	725,797.84	0.81	-554.91	-9.72	
10,414.00	11.97	224.40	10,321.68	631.71 S	723.75 W	503,882.69	725,797.55	0.81	-555.17	-9.71	
10,416.00	11.98	224.39	10,323.63	632.01 S	724.04 W	503,882.39	725,797.26	0.81	-555.44	-9.69	
10,418.00	12.00	224.37	10,325.59	632.30 S	724.34 W	503,882.10	725,796.96	0.81	-555.70	-9.68	
10,420.00	12.01	224.36	10,327.55	632.60 S	724.63 W	503,881.80	725,796.67	0.81	-555.97	-9.67	
10,422.00	12.03	224.35	10,329.50	632.90 S	724.92 W	503,881.50	725,796.38	0.81	-556.24	-9.66	
10,424.00	12.05	224.33	10,331.46	633.20 S	725.21 W	503,881.20	725,796.09	0.81	-556.50	-9.64	
10,426.00	12.06	224.32	10,333.42	633.49 S	725.50 W	503,880.91	725,795.80	0.81	-556.77	-9.63	
10,428.00	12.08	224.31	10,335.37	633.79 S	725.79 W	503,880.61	725,795.51	0.81	-557.04	-9.62	
10,430.00	12.09	224.29	10,337.33	634.09 S	726.09 W	503,880.31	725,795.21	0.81	-557.31	-9.60	
10,432.00	12.11	224.28	10,339.28	634.39 S	726.38 W	503,880.01	725,794.92	0.81	-557.58	-9.59	
10,434.00	12.13	224.27	10,341.24	634.69 S	726.67 W	503,879.71	725,794.63	0.81	-557.85	-9.58	
10,436.00	12.14	224.26	10,343.19	635.00 S	726.96 W	503,879.40	725,794.34	0.81	-558.12	-9.57	
10,438.00	12.16	224.24	10,345.15	635.30 S	727.26 W	503,879.10	725,794.04	0.81	-558.39	-9.55	
10,440.00	12.17	224.23	10,347.10	635.60 S	727.55 W	503,878.80	725,793.75	0.81	-558.66	-9.54	
10,442.00	12.19	224.22	10,349.06	635.90 S	727.85 W	503,878.50	725,793.45	0.81	-558.93	-9.53	
10,444.00	12.21	224.21	10,351.01	636.20 S	728.14 W	503,878.20	725,793.16	0.81	-559.20	-9.52	
10,446.00	12.22	224.19	10,352.97	636.51 S	728.44 W	503,877.89	725,792.86	0.81	-559.47	-9.50	
10,448.00	12.24	224.18	10,354.92	636.81 S	728.73 W	503,877.59	725,792.57	0.81	-559.74	-9.49	
10,450.00	12.25	224.17	10,356.88	637.12 S	729.03 W	503,877.28	725,792.27	0.81	-560.02	-9.48	
10,452.00	12.27	224.15	10,358.83	637.42 S	729.32 W	503,876.98	725,791.98	0.81	-560.29	-9.47	
10,454.00	12.29	224.14	10,360.79	637.73 S	729.62 W	503,876.67	725,791.68	0.81	-560.56	-9.46	
10,456.00	12.30	224.13	10,362.74	638.03 S	729.92 W	503,876.37	725,791.38	0.81	-560.84	-9.44	
10,458.00	12.32	224.12	10,364.69	638.34 S	730.21 W	503,876.06	725,791.09	0.81	-561.11	-9.43	
10,460.00	12.33	224.10	10,366.65	638.64 S	730.51 W	503,875.76	725,790.79	0.81	-561.39	-9.42	
10,462.00	12.35	224.09	10,368.60	638.95 S	730.81 W	503,875.45	725,790.49	0.81	-561.66	-9.41	
10,464.00	12.37	224.08	10,370.56	639.26 S	731.11 W	503,875.14	725,790.19	0.81	-561.94	-9.39	
10,466.00	12.38	224.07	10,372.51	639.57 S	731.40 W	503,874.83	725,789.90	0.81	-562.21	-9.38	
10,468.00	12.40	224.06	10,374.46	639.87 S	731.70 W	503,874.53	725,789.60	0.81	-562.49	-9.37	
10,470.00	12.41	224.04	10,376.42	640.18 S	732.00 W	503,874.22	725,789.30	0.81	-562.77	-9.36	
10,472.00	12.43	224.03	10,378.37	640.49 S	732.30 W	503,873.91	725,789.00	0.81	-563.04	-9.35	
10,474.00	12.45	224.02	10,380.32	640.80 S	732.60 W	503,873.60	725,788.70	0.81	-563.32	-9.33	
10,476.00	12.46	224.01	10,382.27	641.11 S	732.90 W	503,873.29	725,788.40	0.81	-563.60	-9.32	
10,478.00	12.48	223.99	10,384.23	641.42 S	733.20 W	503,872.98	725,788.10	0.81	-563.88	-9.31	

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Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
10,480.00	12.49	223.98	10,386.18	641.73 S	733.50 W	503,872.67	725,787.80	0.81	-564.16	-9.30	
10,482.00	12.51	223.97	10,388.13	642.05 S	733.80 W	503,872.35	725,787.50	0.81	-564.44	-9.29	
10,484.00	12.52	223.97	10,390.09	642.36 S	734.10 W	503,872.04	725,787.20	0.58	-564.72	-4.00	
10,486.00	12.53	223.96	10,392.04	642.67 S	734.40 W	503,871.73	725,786.90	0.58	-565.00	-3.99	
10,488.00	12.54	223.96	10,393.99	642.98 S	734.70 W	503,871.42	725,786.60	0.58	-565.28	-3.99	
10,490.00	12.56	223.96	10,395.94	643.30 S	735.01 W	503,871.10	725,786.29	0.58	-565.56	-3.98	
10,492.00	12.57	223.95	10,397.89	643.61 S	735.31 W	503,870.79	725,785.99	0.58	-565.84	-3.98	
10,494.00	12.58	223.95	10,399.85	643.92 S	735.61 W	503,870.48	725,785.69	0.58	-566.12	-3.98	
10,496.00	12.59	223.94	10,401.80	644.24 S	735.91 W	503,870.16	725,785.39	0.58	-566.40	-3.97	
10,498.00	12.60	223.94	10,403.75	644.55 S	736.21 W	503,869.85	725,785.09	0.58	-566.68	-3.97	
10,500.00	12.61	223.94	10,405.70	644.86 S	736.52 W	503,869.54	725,784.78	0.58	-566.97	-3.97	
10,502.00	12.63	223.93	10,407.65	645.18 S	736.82 W	503,869.22	725,784.48	0.58	-567.25	-3.96	
10,504.00	12.64	223.93	10,409.61	645.49 S	737.12 W	503,868.91	725,784.18	0.58	-567.53	-3.96	
10,506.00	12.65	223.93	10,411.56	645.81 S	737.43 W	503,868.59	725,783.87	0.58	-567.81	-3.96	
10,508.00	12.66	223.92	10,413.51	646.12 S	737.73 W	503,868.28	725,783.57	0.58	-568.10	-3.95	
10,510.00	12.67	223.92	10,415.46	646.44 S	738.04 W	503,867.96	725,783.26	0.58	-568.38	-3.95	
10,512.00	12.68	223.91	10,417.41	646.76 S	738.34 W	503,867.64	725,782.96	0.58	-568.66	-3.95	
10,514.00	12.70	223.91	10,419.36	647.07 S	738.64 W	503,867.33	725,782.66	0.58	-568.95	-3.94	
10,516.00	12.71	223.91	10,421.31	647.39 S	738.95 W	503,867.01	725,782.35	0.58	-569.23	-3.94	
10,518.00	12.72	223.90	10,423.26	647.71 S	739.25 W	503,866.69	725,782.05	0.58	-569.52	-3.93	
10,520.00	12.73	223.90	10,425.21	648.02 S	739.56 W	503,866.38	725,781.74	0.58	-569.80	-3.93	
10,522.00	12.74	223.90	10,427.17	648.34 S	739.87 W	503,866.06	725,781.43	0.58	-570.09	-3.93	
10,524.00	12.75	223.89	10,429.12	648.66 S	740.17 W	503,865.74	725,781.13	0.58	-570.37	-3.92	
10,526.00	12.76	223.89	10,431.07	648.98 S	740.48 W	503,865.42	725,780.82	0.58	-570.66	-3.92	
10,528.00	12.78	223.89	10,433.02	649.30 S	740.78 W	503,865.10	725,780.52	0.58	-570.94	-3.92	
10,530.00	12.79	223.88	10,434.97	649.62 S	741.09 W	503,864.78	725,780.21	0.58	-571.23	-3.91	
10,532.00	12.80	223.88	10,436.92	649.94 S	741.40 W	503,864.46	725,779.90	0.58	-571.52	-3.91	
10,534.00	12.81	223.88	10,438.87	650.26 S	741.71 W	503,864.14	725,779.59	0.58	-571.80	-3.91	
10,536.00	12.82	223.87	10,440.82	650.57 S	742.01 W	503,863.83	725,779.29	0.58	-572.09	-3.90	
10,538.00	12.83	223.87	10,442.77	650.89 S	742.32 W	503,863.51	725,778.98	0.58	-572.38	-3.90	
10,540.00	12.85	223.86	10,444.72	651.22 S	742.63 W	503,863.18	725,778.67	0.58	-572.67	-3.90	
10,542.00	12.86	223.86	10,446.67	651.54 S	742.94 W	503,862.86	725,778.36	0.58	-572.95	-3.89	
10,544.00	12.87	223.86	10,448.62	651.86 S	743.25 W	503,862.54	725,778.05	0.58	-573.24	-3.89	
10,546.00	12.88	223.85	10,450.57	652.18 S	743.55 W	503,862.22	725,777.75	0.58	-573.53	-3.89	
10,548.00	12.89	223.85	10,452.52	652.50 S	743.86 W	503,861.90	725,777.44	0.58	-573.82	-3.88	
10,550.00	12.90	223.85	10,454.47	652.82 S	744.17 W	503,861.58	725,777.13	0.58	-574.11	-3.88	
10,552.00	12.92	223.84	10,456.42	653.14 S	744.48 W	503,861.26	725,776.82	0.58	-574.40	-3.88	

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				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
10,554.00	12.93	223.84	10,458.37	653.47 S	744.79 W	503,860.93	725,776.51	0.58	-574.69	-3.87	
10,556.00	12.94	223.84	10,460.32	653.79 S	745.10 W	503,860.61	725,776.20	0.58	-574.98	-3.87	
10,558.00	12.95	223.83	10,462.26	654.11 S	745.41 W	503,860.29	725,775.89	0.58	-575.27	-3.87	
10,560.00	12.96	223.83	10,464.21	654.44 S	745.72 W	503,859.96	725,775.58	0.58	-575.56	-3.86	
10,562.00	12.97	223.83	10,466.16	654.76 S	746.03 W	503,859.64	725,775.27	0.58	-575.85	-3.86	
10,564.00	12.98	223.82	10,468.11	655.08 S	746.34 W	503,859.32	725,774.96	0.58	-576.14	-3.86	
10,566.00	13.00	223.82	10,470.06	655.41 S	746.66 W	503,858.99	725,774.64	0.58	-576.43	-3.85	
10,568.00	13.01	223.82	10,472.01	655.73 S	746.97 W	503,858.67	725,774.33	0.58	-576.72	-3.85	
10,570.00	13.02	223.81	10,473.96	656.06 S	747.28 W	503,858.34	725,774.02	0.58	-577.01	-3.85	
10,572.00	13.03	223.81	10,475.91	656.38 S	747.59 W	503,858.02	725,773.71	0.58	-577.31	-3.84	
10,574.00	13.04	223.81	10,477.85	656.71 S	747.90 W	503,857.69	725,773.40	0.58	-577.60	-3.84	
10,576.00	13.05	223.80	10,479.80	657.04 S	748.22 W	503,857.36	725,773.08	0.58	-577.89	-3.84	
10,578.00	13.05	223.83	10,481.75	657.36 S	748.53 W	503,857.04	725,772.77	0.42	-578.18	133.30	
10,580.00	13.03	223.89	10,483.70	657.69 S	748.84 W	503,856.71	725,772.46	1.32	-578.47	150.61	
10,582.00	13.00	223.94	10,485.65	658.01 S	749.15 W	503,856.39	725,772.15	1.32	-578.77	150.56	
10,584.00	12.98	224.00	10,487.60	658.33 S	749.47 W	503,856.07	725,771.83	1.32	-579.06	150.50	
10,586.00	12.96	224.06	10,489.55	658.66 S	749.78 W	503,855.74	725,771.52	1.32	-579.35	150.44	
10,588.00	12.93	224.12	10,491.50	658.98 S	750.09 W	503,855.42	725,771.21	1.32	-579.63	150.39	
10,590.00	12.91	224.18	10,493.44	659.30 S	750.40 W	503,855.10	725,770.90	1.32	-579.92	150.33	
10,592.00	12.89	224.24	10,495.39	659.62 S	750.71 W	503,854.78	725,770.59	1.32	-580.21	150.27	
10,594.00	12.86	224.30	10,497.34	659.94 S	751.02 W	503,854.46	725,770.28	1.32	-580.49	150.21	
10,596.00	12.84	224.36	10,499.29	660.26 S	751.33 W	503,854.14	725,769.97	1.32	-580.78	150.16	
10,598.00	12.82	224.41	10,501.24	660.57 S	751.65 W	503,853.83	725,769.65	1.32	-581.06	150.10	
10,600.00	12.80	224.47	10,503.19	660.89 S	751.96 W	503,853.51	725,769.34	1.32	-581.35	150.04	
10,602.00	12.77	224.53	10,505.14	661.21 S	752.27 W	503,853.19	725,769.03	1.32	-581.63	149.98	
10,604.00	12.75	224.59	10,507.10	661.52 S	752.58 W	503,852.88	725,768.72	1.32	-581.91	149.92	
10,606.00	12.73	224.66	10,509.05	661.84 S	752.89 W	503,852.56	725,768.41	1.32	-582.19	149.87	
10,608.00	12.70	224.72	10,511.00	662.15 S	753.20 W	503,852.25	725,768.10	1.32	-582.47	149.81	
10,610.00	12.68	224.78	10,512.95	662.46 S	753.50 W	503,851.94	725,767.80	1.32	-582.75	149.75	
10,612.00	12.66	224.84	10,514.90	662.77 S	753.81 W	503,851.63	725,767.49	1.32	-583.03	149.69	
10,614.00	12.64	224.90	10,516.85	663.08 S	754.12 W	503,851.32	725,767.18	1.32	-583.31	149.63	
10,616.00	12.61	224.96	10,518.80	663.39 S	754.43 W	503,851.01	725,766.87	1.32	-583.58	149.57	
10,618.00	12.59	225.02	10,520.75	663.70 S	754.74 W	503,850.70	725,766.56	1.32	-583.86	149.51	
10,620.00	12.57	225.08	10,522.71	664.01 S	755.05 W	503,850.39	725,766.25	1.32	-584.14	149.45	
10,622.00	12.54	225.15	10,524.66	664.31 S	755.36 W	503,850.09	725,765.94	1.32	-584.41	149.39	
10,624.00	12.52	225.21	10,526.61	664.62 S	755.66 W	503,849.78	725,765.64	1.32	-584.68	149.33	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
10,626.00	12.50	225.27	10,528.56	664.93 S	755.97 W	503,849.47	725,765.33	1.32	-584.95	149.27	
10,628.00	12.48	225.33	10,530.52	665.23 S	756.28 W	503,849.17	725,765.02	1.32	-585.23	149.21	
10,630.00	12.45	225.40	10,532.47	665.53 S	756.59 W	503,848.87	725,764.71	1.32	-585.50	149.14	
10,632.00	12.43	225.46	10,534.42	665.84 S	756.89 W	503,848.56	725,764.41	1.32	-585.77	149.08	
10,634.00	12.41	225.52	10,536.38	666.14 S	757.20 W	503,848.26	725,764.10	1.32	-586.04	149.02	
10,636.00	12.38	225.59	10,538.33	666.44 S	757.51 W	503,847.96	725,763.79	1.32	-586.30	148.96	
10,638.00	12.36	225.65	10,540.28	666.74 S	757.81 W	503,847.66	725,763.49	1.32	-586.57	148.90	
10,640.00	12.34	225.72	10,542.24	667.04 S	758.12 W	503,847.36	725,763.18	1.32	-586.84	148.83	
10,642.00	12.32	225.78	10,544.19	667.33 S	758.42 W	503,847.07	725,762.88	1.32	-587.10	148.77	
10,644.00	12.29	225.84	10,546.14	667.63 S	758.73 W	503,846.77	725,762.57	1.32	-587.37	148.71	
10,646.00	12.27	225.91	10,548.10	667.93 S	759.04 W	503,846.47	725,762.26	1.32	-587.63	148.65	
10,648.00	12.25	225.97	10,550.05	668.22 S	759.34 W	503,846.18	725,761.96	1.32	-587.89	148.58	
10,650.00	12.23	226.04	10,552.01	668.52 S	759.65 W	503,845.88	725,761.65	1.32	-588.16	148.52	
10,652.00	12.20	226.10	10,553.96	668.81 S	759.95 W	503,845.59	725,761.35	1.32	-588.42	148.45	
10,654.00	12.18	226.17	10,555.92	669.10 S	760.26 W	503,845.30	725,761.04	1.32	-588.68	148.39	
10,656.00	12.16	226.24	10,557.87	669.40 S	760.56 W	503,845.00	725,760.74	1.32	-588.94	148.33	
10,658.00	12.14	226.30	10,559.83	669.69 S	760.86 W	503,844.71	725,760.44	1.32	-589.20	148.26	
10,660.00	12.11	226.37	10,561.78	669.98 S	761.17 W	503,844.42	725,760.13	1.32	-589.45	148.20	
10,662.00	12.09	226.44	10,563.74	670.27 S	761.47 W	503,844.13	725,759.83	1.32	-589.71	148.13	
10,664.00	12.07	226.50	10,565.69	670.55 S	761.77 W	503,843.85	725,759.53	1.32	-589.97	148.07	
10,666.00	12.05	226.57	10,567.65	670.84 S	762.08 W	503,843.56	725,759.22	1.32	-590.22	148.00	
10,668.00	12.02	226.64	10,569.61	671.13 S	762.38 W	503,843.27	725,758.92	1.32	-590.48	147.93	
10,670.00	12.00	226.71	10,571.56	671.41 S	762.68 W	503,842.99	725,758.62	1.32	-590.73	147.87	
10,672.00	11.98	226.74	10,573.52	671.70 S	762.99 W	503,842.70	725,758.31	1.22	-590.98	162.48	
10,674.00	11.95	226.74	10,575.47	671.98 S	763.29 W	503,842.42	725,758.01	1.20	-591.23	178.67	
10,676.00	11.93	226.75	10,577.43	672.27 S	763.59 W	503,842.13	725,757.71	1.20	-591.49	178.67	
10,678.00	11.91	226.75	10,579.39	672.55 S	763.89 W	503,841.85	725,757.41	1.20	-591.74	178.67	
10,680.00	11.88	226.75	10,581.35	672.83 S	764.19 W	503,841.57	725,757.11	1.20	-591.99	178.67	
10,682.00	11.86	226.75	10,583.30	673.11 S	764.49 W	503,841.29	725,756.81	1.20	-592.24	178.66	
10,684.00	11.83	226.76	10,585.26	673.39 S	764.79 W	503,841.01	725,756.51	1.20	-592.49	178.66	
10,686.00	11.81	226.76	10,587.22	673.67 S	765.09 W	503,840.73	725,756.21	1.20	-592.74	178.66	
10,688.00	11.79	226.76	10,589.18	673.95 S	765.39 W	503,840.45	725,755.91	1.20	-592.98	178.66	
10,690.00	11.76	226.77	10,591.13	674.23 S	765.68 W	503,840.17	725,755.62	1.20	-593.23	178.65	
10,692.00	11.74	226.77	10,593.09	674.51 S	765.98 W	503,839.89	725,755.32	1.20	-593.48	178.65	
10,694.00	11.71	226.77	10,595.05	674.79 S	766.28 W	503,839.61	725,755.02	1.20	-593.73	178.65	
10,696.00	11.69	226.77	10,597.01	675.07 S	766.57 W	503,839.33	725,754.73	1.20	-593.97	178.64	
10,698.00	11.67	226.78	10,598.97	675.35 S	766.87 W	503,839.05	725,754.43	1.20	-594.22	178.64	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
10,700.00	11.64	226.78	10,600.93	675.62 S	767.16 W	503,838.78	725,754.14	1.20	-594.46	178.64	
10,702.00	11.62	226.78	10,602.88	675.90 S	767.45 W	503,838.50	725,753.85	1.20	-594.71	178.64	
10,704.00	11.59	226.79	10,604.84	676.18 S	767.75 W	503,838.22	725,753.55	1.20	-594.95	178.63	
10,706.00	11.57	226.79	10,606.80	676.45 S	768.04 W	503,837.95	725,753.26	1.20	-595.20	178.63	
10,708.00	11.55	226.79	10,608.76	676.72 S	768.33 W	503,837.68	725,752.97	1.20	-595.44	178.63	
10,710.00	11.52	226.79	10,610.72	677.00 S	768.62 W	503,837.40	725,752.68	1.20	-595.68	178.63	
10,712.00	11.50	226.80	10,612.68	677.27 S	768.91 W	503,837.13	725,752.39	1.20	-595.93	178.62	
10,714.00	11.47	226.80	10,614.64	677.54 S	769.21 W	503,836.86	725,752.09	1.20	-596.17	178.62	
10,716.00	11.45	226.80	10,616.60	677.82 S	769.49 W	503,836.58	725,751.81	1.20	-596.41	178.62	
10,718.00	11.43	226.81	10,618.56	678.09 S	769.78 W	503,836.31	725,751.52	1.20	-596.65	178.61	
10,720.00	11.40	226.81	10,620.52	678.36 S	770.07 W	503,836.04	725,751.23	1.20	-596.89	178.61	
10,722.00	11.38	226.81	10,622.48	678.63 S	770.36 W	503,835.77	725,750.94	1.20	-597.13	178.61	
10,724.00	11.35	226.81	10,624.44	678.90 S	770.65 W	503,835.50	725,750.65	1.20	-597.37	178.61	
10,726.00	11.33	226.82	10,626.40	679.17 S	770.93 W	503,835.23	725,750.37	1.20	-597.61	178.60	
10,728.00	11.31	226.82	10,628.37	679.44 S	771.22 W	503,834.96	725,750.08	1.20	-597.85	178.60	
10,730.00	11.28	226.82	10,630.33	679.70 S	771.51 W	503,834.70	725,749.79	1.20	-598.08	178.60	
10,732.00	11.26	226.83	10,632.29	679.97 S	771.79 W	503,834.43	725,749.51	1.20	-598.32	178.59	
10,734.00	11.23	226.83	10,634.25	680.24 S	772.08 W	503,834.16	725,749.22	1.20	-598.56	178.59	
10,736.00	11.21	226.83	10,636.21	680.51 S	772.36 W	503,833.89	725,748.94	1.20	-598.79	178.59	
10,738.00	11.19	226.84	10,638.17	680.77 S	772.64 W	503,833.63	725,748.66	1.20	-599.03	178.58	
10,740.00	11.16	226.84	10,640.14	681.04 S	772.93 W	503,833.36	725,748.37	1.20	-599.27	178.58	
10,742.00	11.14	226.84	10,642.10	681.30 S	773.21 W	503,833.10	725,748.09	1.20	-599.50	178.58	
10,744.00	11.11	226.85	10,644.06	681.56 S	773.49 W	503,832.84	725,747.81	1.20	-599.73	178.58	
10,746.00	11.09	226.85	10,646.02	681.83 S	773.77 W	503,832.57	725,747.53	1.20	-599.97	178.57	
10,748.00	11.07	226.85	10,647.99	682.09 S	774.05 W	503,832.31	725,747.25	1.20	-600.20	178.57	
10,750.00	11.04	226.85	10,649.95	682.35 S	774.33 W	503,832.05	725,746.97	1.20	-600.43	178.57	
10,752.00	11.02	226.86	10,651.91	682.61 S	774.61 W	503,831.79	725,746.69	1.20	-600.67	178.56	
10,754.00	10.99	226.86	10,653.87	682.88 S	774.89 W	503,831.52	725,746.41	1.20	-600.90	178.56	
10,756.00	10.97	226.86	10,655.84	683.14 S	775.17 W	503,831.26	725,746.13	1.20	-601.13	178.56	
10,758.00	10.95	226.87	10,657.80	683.40 S	775.44 W	503,831.00	725,745.86	1.20	-601.36	178.55	
10,760.00	10.92	226.87	10,659.77	683.66 S	775.72 W	503,830.74	725,745.58	1.20	-601.59	178.55	
10,762.00	10.90	226.87	10,661.73	683.91 S	776.00 W	503,830.49	725,745.30	1.20	-601.82	178.55	
10,764.00	10.87	226.88	10,663.69	684.17 S	776.27 W	503,830.23	725,745.03	1.20	-602.05	178.54	
10,766.00	10.85	226.88	10,665.66	684.43 S	776.55 W	503,829.97	725,744.75	1.20	-602.28	178.54	
10,768.00	10.85	226.97	10,667.62	684.69 S	776.82 W	503,829.71	725,744.48	0.82	-602.50	91.31	
10,770.00	10.85	227.06	10,669.59	684.94 S	777.10 W	503,829.46	725,744.20	0.82	-602.73	91.23	
10,772.00	10.85	227.14	10,671.55	685.20 S	777.37 W	503,829.20	725,743.93	0.82	-602.96	91.14	

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Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
10,774.00	10.85	227.23	10,673.51	685.46 S	777.65 W	503,828.94	725,743.65	0.82	-603.18	91.05	
10,776.00	10.85	227.32	10,675.48	685.71 S	777.93 W	503,828.69	725,743.37	0.82	-603.41	90.97	
10,778.00	10.85	227.41	10,677.44	685.97 S	778.20 W	503,828.43	725,743.10	0.82	-603.64	90.88	
10,780.00	10.85	227.49	10,679.41	686.22 S	778.48 W	503,828.18	725,742.82	0.82	-603.86	90.80	
10,782.00	10.85	227.58	10,681.37	686.47 S	778.76 W	503,827.93	725,742.54	0.82	-604.09	90.71	
10,784.00	10.85	227.67	10,683.34	686.73 S	779.04 W	503,827.67	725,742.26	0.82	-604.31	90.62	
10,786.00	10.85	227.76	10,685.30	686.98 S	779.32 W	503,827.42	725,741.98	0.82	-604.53	90.54	
10,788.00	10.85	227.84	10,687.26	687.23 S	779.59 W	503,827.17	725,741.71	0.82	-604.76	90.45	
10,790.00	10.85	227.93	10,689.23	687.49 S	779.87 W	503,826.91	725,741.43	0.82	-604.98	90.37	
10,792.00	10.85	228.02	10,691.19	687.74 S	780.15 W	503,826.66	725,741.15	0.82	-605.20	90.28	
10,794.00	10.85	228.11	10,693.16	687.99 S	780.43 W	503,826.41	725,740.87	0.82	-605.42	90.19	
10,796.00	10.85	228.19	10,695.12	688.24 S	780.71 W	503,826.16	725,740.59	0.82	-605.65	90.11	
10,798.00	10.85	228.28	10,697.09	688.49 S	780.99 W	503,825.91	725,740.31	0.82	-605.87	90.02	
10,800.00	10.85	228.37	10,699.05	688.74 S	781.27 W	503,825.66	725,740.03	0.82	-606.09	89.94	
10,802.00	10.85	228.46	10,701.01	688.99 S	781.56 W	503,825.41	725,739.74	0.82	-606.31	89.85	
10,804.00	10.85	228.54	10,702.98	689.24 S	781.84 W	503,825.16	725,739.46	0.82	-606.53	89.76	
10,806.00	10.85	228.63	10,704.94	689.49 S	782.12 W	503,824.91	725,739.18	0.82	-606.75	89.68	
10,808.00	10.85	228.72	10,706.91	689.74 S	782.40 W	503,824.66	725,738.90	0.82	-606.96	89.59	
10,810.00	10.85	228.81	10,708.87	689.99 S	782.69 W	503,824.41	725,738.61	0.82	-607.18	89.50	
10,812.00	10.85	228.90	10,710.84	690.24 S	782.97 W	503,824.16	725,738.33	0.82	-607.40	89.42	
10,814.00	10.85	228.98	10,712.80	690.48 S	783.25 W	503,823.92	725,738.05	0.82	-607.62	89.33	
10,816.00	10.85	229.07	10,714.76	690.73 S	783.54 W	503,823.67	725,737.76	0.82	-607.83	89.25	
10,818.00	10.85	229.16	10,716.73	690.98 S	783.82 W	503,823.42	725,737.48	0.82	-608.05	89.16	
10,820.00	10.85	229.25	10,718.69	691.22 S	784.11 W	503,823.18	725,737.19	0.82	-608.27	89.07	
10,822.00	10.85	229.33	10,720.66	691.47 S	784.39 W	503,822.93	725,736.91	0.82	-608.48	88.99	
10,824.00	10.85	229.42	10,722.62	691.71 S	784.68 W	503,822.69	725,736.62	0.82	-608.70	88.90	
10,826.00	10.85	229.51	10,724.59	691.96 S	784.96 W	503,822.44	725,736.34	0.82	-608.91	88.82	
10,828.00	10.85	229.60	10,726.55	692.20 S	785.25 W	503,822.20	725,736.05	0.82	-609.13	88.73	
10,830.00	10.85	229.68	10,728.51	692.44 S	785.54 W	503,821.96	725,735.76	0.82	-609.34	88.64	
10,832.00	10.85	229.77	10,730.48	692.69 S	785.83 W	503,821.71	725,735.47	0.82	-609.55	88.56	
10,834.00	10.85	229.86	10,732.44	692.93 S	786.11 W	503,821.47	725,735.19	0.82	-609.76	88.47	
10,836.00	10.85	229.95	10,734.41	693.17 S	786.40 W	503,821.23	725,734.90	0.82	-609.98	88.39	
10,838.00	10.85	230.03	10,736.37	693.42 S	786.69 W	503,820.98	725,734.61	0.82	-610.19	88.30	
10,840.00	10.85	230.12	10,738.34	693.66 S	786.98 W	503,820.74	725,734.32	0.82	-610.40	88.21	
10,842.00	10.85	230.21	10,740.30	693.90 S	787.27 W	503,820.50	725,734.03	0.82	-610.61	88.13	
10,844.00	10.85	230.30	10,742.26	694.14 S	787.56 W	503,820.26	725,733.74	0.82	-610.82	88.04	



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				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
10,846.00	10.85	230.38	10,744.23	694.38 S	787.85 W	503,820.02	725,733.45	0.82	-611.03	87.96	
10,848.00	10.86	230.47	10,746.19	694.62 S	788.14 W	503,819.78	725,733.16	0.82	-611.24	87.87	
10,850.00	10.86	230.56	10,748.16	694.86 S	788.43 W	503,819.54	725,732.87	0.82	-611.45	87.78	
10,852.00	10.86	230.65	10,750.12	695.10 S	788.72 W	503,819.30	725,732.58	0.82	-611.66	87.70	
10,854.00	10.86	230.73	10,752.08	695.34 S	789.01 W	503,819.06	725,732.29	0.82	-611.86	87.61	
10,856.00	10.86	230.82	10,754.05	695.58 S	789.30 W	503,818.82	725,732.00	0.82	-612.07	87.53	
10,858.00	10.86	230.91	10,756.01	695.81 S	789.59 W	503,818.59	725,731.71	0.82	-612.28	87.44	
10,860.00	10.86	231.00	10,757.98	696.05 S	789.89 W	503,818.35	725,731.41	0.82	-612.49	87.36	
10,862.00	10.85	231.05	10,759.94	696.29 S	790.18 W	503,818.11	725,731.12	0.55	-612.69	120.91	
10,864.00	10.84	231.06	10,761.91	696.52 S	790.47 W	503,817.88	725,730.83	0.62	-612.90	168.32	
10,866.00	10.83	231.07	10,763.87	696.76 S	790.77 W	503,817.64	725,730.53	0.62	-613.10	168.31	
10,868.00	10.82	231.09	10,765.83	697.00 S	791.06 W	503,817.40	725,730.24	0.62	-613.31	168.29	
10,870.00	10.81	231.10	10,767.80	697.23 S	791.35 W	503,817.17	725,729.95	0.62	-613.51	168.28	
10,872.00	10.79	231.11	10,769.76	697.47 S	791.64 W	503,816.93	725,729.66	0.62	-613.72	168.27	
10,874.00	10.78	231.13	10,771.73	697.70 S	791.93 W	503,816.70	725,729.37	0.62	-613.92	168.25	
10,876.00	10.77	231.14	10,773.69	697.94 S	792.22 W	503,816.46	725,729.08	0.62	-614.13	168.24	
10,878.00	10.76	231.15	10,775.66	698.17 S	792.51 W	503,816.23	725,728.79	0.62	-614.33	168.23	
10,880.00	10.74	231.17	10,777.62	698.41 S	792.81 W	503,815.99	725,728.49	0.62	-614.53	168.22	
10,882.00	10.73	231.18	10,779.59	698.64 S	793.10 W	503,815.76	725,728.20	0.62	-614.74	168.20	
10,884.00	10.72	231.20	10,781.55	698.87 S	793.39 W	503,815.53	725,727.91	0.62	-614.94	168.19	
10,886.00	10.71	231.21	10,783.52	699.11 S	793.68 W	503,815.29	725,727.62	0.62	-615.14	168.18	
10,888.00	10.70	231.22	10,785.48	699.34 S	793.96 W	503,815.06	725,727.34	0.62	-615.34	168.16	
10,890.00	10.68	231.24	10,787.45	699.57 S	794.25 W	503,814.83	725,727.05	0.62	-615.54	168.15	
10,892.00	10.67	231.25	10,789.41	699.80 S	794.54 W	503,814.60	725,726.76	0.62	-615.75	168.13	
10,894.00	10.66	231.26	10,791.38	700.03 S	794.83 W	503,814.37	725,726.47	0.62	-615.95	168.12	
10,896.00	10.65	231.28	10,793.34	700.26 S	795.12 W	503,814.14	725,726.18	0.62	-616.15	168.11	
10,898.00	10.64	231.29	10,795.31	700.50 S	795.41 W	503,813.90	725,725.89	0.62	-616.35	168.09	
10,900.00	10.62	231.31	10,797.28	700.73 S	795.70 W	503,813.67	725,725.60	0.62	-616.55	168.08	
10,902.00	10.61	231.32	10,799.24	700.96 S	795.98 W	503,813.44	725,725.32	0.62	-616.75	168.07	
10,904.00	10.60	231.33	10,801.21	701.19 S	796.27 W	503,813.21	725,725.03	0.62	-616.95	168.05	
10,906.00	10.59	231.35	10,803.17	701.42 S	796.56 W	503,812.98	725,724.74	0.62	-617.15	168.04	
10,908.00	10.57	231.36	10,805.14	701.65 S	796.85 W	503,812.75	725,724.45	0.62	-617.35	168.03	
10,910.00	10.56	231.38	10,807.11	701.88 S	797.13 W	503,812.52	725,724.17	0.62	-617.55	168.01	
10,912.00	10.55	231.39	10,809.07	702.10 S	797.42 W	503,812.30	725,723.88	0.62	-617.74	168.00	
10,914.00	10.54	231.40	10,811.04	702.33 S	797.70 W	503,812.07	725,723.60	0.62	-617.94	167.98	
10,916.00	10.53	231.42	10,813.00	702.56 S	797.99 W	503,811.84	725,723.31	0.62	-618.14	167.97	
10,918.00	10.51	231.43	10,814.97	702.79 S	798.28 W	503,811.61	725,723.02	0.62	-618.34	167.96	

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Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
10,920.00	10.50	231.45	10,816.94	703.02 S	798.56 W	503,811.38	725,722.74	0.62	-618.54	167.94	
10,922.00	10.49	231.46	10,818.90	703.24 S	798.85 W	503,811.16	725,722.45	0.62	-618.73	167.93	
10,924.00	10.48	231.47	10,820.87	703.47 S	799.13 W	503,810.93	725,722.17	0.62	-618.93	167.91	
10,926.00	10.47	231.49	10,822.84	703.70 S	799.41 W	503,810.70	725,721.89	0.62	-619.13	167.90	
10,928.00	10.45	231.50	10,824.80	703.92 S	799.70 W	503,810.48	725,721.60	0.62	-619.32	167.89	
10,930.00	10.44	231.52	10,826.77	704.15 S	799.98 W	503,810.25	725,721.32	0.62	-619.52	167.87	
10,932.00	10.43	231.53	10,828.74	704.37 S	800.27 W	503,810.03	725,721.03	0.62	-619.71	167.86	
10,934.00	10.42	231.55	10,830.70	704.60 S	800.55 W	503,809.80	725,720.75	0.62	-619.91	167.84	
10,936.00	10.41	231.56	10,832.67	704.82 S	800.83 W	503,809.58	725,720.47	0.62	-620.10	167.83	
10,938.00	10.39	231.58	10,834.64	705.05 S	801.12 W	503,809.35	725,720.18	0.62	-620.30	167.82	
10,940.00	10.38	231.59	10,836.61	705.27 S	801.40 W	503,809.13	725,719.90	0.62	-620.49	167.80	
10,942.00	10.37	231.60	10,838.57	705.49 S	801.68 W	503,808.91	725,719.62	0.62	-620.69	167.79	
10,944.00	10.36	231.62	10,840.54	705.72 S	801.96 W	503,808.68	725,719.34	0.62	-620.88	167.77	
10,946.00	10.34	231.63	10,842.51	705.94 S	802.24 W	503,808.46	725,719.06	0.62	-621.07	167.76	
10,948.00	10.33	231.65	10,844.48	706.16 S	802.53 W	503,808.24	725,718.77	0.62	-621.27	167.74	
10,950.00	10.32	231.66	10,846.44	706.39 S	802.81 W	503,808.01	725,718.49	0.62	-621.46	167.73	
10,952.00	10.31	231.68	10,848.41	706.61 S	803.09 W	503,807.79	725,718.21	0.62	-621.65	167.71	
10,954.00	10.30	231.69	10,850.38	706.83 S	803.37 W	503,807.57	725,717.93	0.62	-621.84	167.70	
10,956.00	10.29	231.70	10,852.35	707.05 S	803.65 W	503,807.35	725,717.65	0.31	-622.04	167.69	
10,958.00	10.29	231.62	10,854.31	707.27 S	803.93 W	503,807.13	725,717.37	0.74	-622.23	-96.20	
10,960.00	10.29	231.56	10,856.28	707.49 S	804.21 W	503,806.91	725,717.09	0.49	-622.42	-96.12	
10,962.00	10.29	231.51	10,858.25	707.72 S	804.49 W	503,806.68	725,716.81	0.49	-622.61	-96.06	
10,964.00	10.29	231.45	10,860.22	707.94 S	804.77 W	503,806.46	725,716.53	0.49	-622.81	-96.01	
10,966.00	10.28	231.40	10,862.19	708.16 S	805.05 W	503,806.24	725,716.25	0.49	-623.00	-95.95	
10,968.00	10.28	231.34	10,864.15	708.39 S	805.33 W	503,806.01	725,715.97	0.49	-623.19	-95.90	
10,970.00	10.28	231.29	10,866.12	708.61 S	805.60 W	503,805.79	725,715.70	0.49	-623.39	-95.85	
10,972.00	10.28	231.23	10,868.09	708.83 S	805.88 W	503,805.57	725,715.42	0.49	-623.58	-95.79	
10,974.00	10.28	231.18	10,870.06	709.06 S	806.16 W	503,805.34	725,715.14	0.49	-623.78	-95.74	
10,976.00	10.28	231.12	10,872.02	709.28 S	806.44 W	503,805.12	725,714.86	0.49	-623.97	-95.68	
10,978.00	10.28	231.07	10,873.99	709.50 S	806.72 W	503,804.90	725,714.58	0.49	-624.16	-95.63	
10,980.00	10.28	231.02	10,875.96	709.73 S	806.99 W	503,804.67	725,714.31	0.49	-624.36	-95.58	
10,982.00	10.28	230.96	10,877.93	709.95 S	807.27 W	503,804.45	725,714.03	0.49	-624.55	-95.52	
10,984.00	10.28	230.91	10,879.90	710.18 S	807.55 W	503,804.22	725,713.75	0.49	-624.75	-95.47	
10,986.00	10.27	230.85	10,881.86	710.40 S	807.83 W	503,804.00	725,713.47	0.49	-624.95	-95.41	
10,988.00	10.27	230.80	10,883.83	710.63 S	808.10 W	503,803.77	725,713.20	0.49	-625.14	-95.36	
10,990.00	10.27	230.74	10,885.80	710.85 S	808.38 W	503,803.55	725,712.92	0.49	-625.34	-95.31	
10,992.00	10.27	230.69	10,887.77	711.08 S	808.65 W	503,803.32	725,712.65	0.49	-625.54	-95.25	

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Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
10,994.00	10.27	230.63	10,889.74	711.30 S	808.93 W	503,803.10	725,712.37	0.49	-625.73	-95.20	
10,996.00	10.27	230.58	10,891.70	711.53 S	809.21 W	503,802.87	725,712.09	0.49	-625.93	-95.14	
10,998.00	10.27	230.52	10,893.67	711.76 S	809.48 W	503,802.64	725,711.82	0.49	-626.13	-95.09	
11,000.00	10.27	230.47	10,895.64	711.98 S	809.76 W	503,802.42	725,711.54	0.49	-626.33	-95.04	
11,002.00	10.27	230.41	10,897.61	712.21 S	810.03 W	503,802.19	725,711.27	0.49	-626.52	-94.98	
11,004.00	10.27	230.36	10,899.58	712.44 S	810.31 W	503,801.96	725,710.99	0.49	-626.72	-94.93	
11,006.00	10.27	230.30	10,901.54	712.67 S	810.58 W	503,801.73	725,710.72	0.49	-626.92	-94.87	
11,008.00	10.27	230.25	10,903.51	712.89 S	810.85 W	503,801.51	725,710.45	0.49	-627.12	-94.82	
11,010.00	10.26	230.19	10,905.48	713.12 S	811.13 W	503,801.28	725,710.17	0.49	-627.32	-94.77	
11,012.00	10.26	230.14	10,907.45	713.35 S	811.40 W	503,801.05	725,709.90	0.49	-627.52	-94.71	
11,014.00	10.26	230.08	10,909.42	713.58 S	811.67 W	503,800.82	725,709.63	0.49	-627.72	-94.66	
11,016.00	10.26	230.03	10,911.38	713.81 S	811.95 W	503,800.59	725,709.35	0.49	-627.92	-94.60	
11,018.00	10.26	229.97	10,913.35	714.04 S	812.22 W	503,800.36	725,709.08	0.49	-628.12	-94.55	
11,020.00	10.26	229.92	10,915.32	714.27 S	812.49 W	503,800.13	725,708.81	0.49	-628.32	-94.50	
11,022.00	10.26	229.86	10,917.29	714.50 S	812.77 W	503,799.90	725,708.53	0.49	-628.52	-94.44	
11,024.00	10.26	229.81	10,919.26	714.73 S	813.04 W	503,799.67	725,708.26	0.49	-628.72	-94.39	
11,026.00	10.26	229.75	10,921.22	714.96 S	813.31 W	503,799.44	725,707.99	0.49	-628.92	-94.33	
11,028.00	10.26	229.70	10,923.19	715.19 S	813.58 W	503,799.21	725,707.72	0.49	-629.12	-94.28	
11,030.00	10.26	229.64	10,925.16	715.42 S	813.85 W	503,798.98	725,707.45	0.49	-629.32	-94.22	
11,032.00	10.26	229.59	10,927.13	715.65 S	814.12 W	503,798.75	725,707.18	0.49	-629.53	-94.17	
11,034.00	10.26	229.53	10,929.10	715.88 S	814.40 W	503,798.52	725,706.90	0.49	-629.73	-94.12	
11,036.00	10.25	229.48	10,931.06	716.11 S	814.67 W	503,798.29	725,706.63	0.49	-629.93	-94.06	
11,038.00	10.25	229.42	10,933.03	716.34 S	814.94 W	503,798.06	725,706.36	0.49	-630.13	-94.01	
11,040.00	10.25	229.37	10,935.00	716.57 S	815.21 W	503,797.83	725,706.09	0.49	-630.34	-93.95	
11,042.00	10.25	229.31	10,936.97	716.80 S	815.48 W	503,797.60	725,705.82	0.49	-630.54	-93.90	
11,044.00	10.25	229.26	10,938.94	717.04 S	815.75 W	503,797.36	725,705.55	0.49	-630.74	-93.85	
11,046.00	10.25	229.20	10,940.90	717.27 S	816.02 W	503,797.13	725,705.28	0.49	-630.95	-93.79	
11,048.00	10.25	229.15	10,942.87	717.50 S	816.29 W	503,796.90	725,705.01	0.49	-631.15	-93.74	
11,050.00	10.25	229.09	10,944.84	717.73 S	816.55 W	503,796.67	725,704.75	0.49	-631.36	-93.68	
11,052.00	10.25	229.07	10,946.81	717.97 S	816.82 W	503,796.43	725,704.48	0.30	-631.56	-139.36	
11,054.00	10.24	229.05	10,948.78	718.20 S	817.09 W	503,796.20	725,704.21	0.30	-631.77	-139.34	
11,056.00	10.24	229.02	10,950.75	718.43 S	817.36 W	503,795.97	725,703.94	0.30	-631.97	-139.32	
11,058.00	10.23	229.00	10,952.71	718.67 S	817.63 W	503,795.73	725,703.67	0.30	-632.18	-139.30	
11,060.00	10.23	228.98	10,954.68	718.90 S	817.90 W	503,795.50	725,703.40	0.30	-632.38	-139.28	
11,062.00	10.22	228.96	10,956.65	719.13 S	818.16 W	503,795.27	725,703.14	0.30	-632.59	-139.26	
11,064.00	10.22	228.94	10,958.62	719.37 S	818.43 W	503,795.03	725,702.87	0.30	-632.79	-139.23	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

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				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
11,066.00	10.21	228.91	10,960.59	719.60 S	818.70 W	503,794.80	725,702.60	0.30	-633.00	-139.21	
11,068.00	10.21	228.89	10,962.55	719.83 S	818.97 W	503,794.57	725,702.33	0.30	-633.20	-139.19	
11,070.00	10.20	228.87	10,964.52	720.07 S	819.23 W	503,794.33	725,702.07	0.30	-633.40	-139.17	
11,072.00	10.20	228.85	10,966.49	720.30 S	819.50 W	503,794.10	725,701.80	0.30	-633.61	-139.15	
11,074.00	10.20	228.82	10,968.46	720.53 S	819.77 W	503,793.87	725,701.53	0.30	-633.81	-139.13	
11,076.00	10.19	228.80	10,970.43	720.76 S	820.03 W	503,793.64	725,701.27	0.30	-634.02	-139.10	
11,078.00	10.19	228.78	10,972.40	721.00 S	820.30 W	503,793.40	725,701.00	0.30	-634.22	-139.08	
11,080.00	10.18	228.76	10,974.37	721.23 S	820.57 W	503,793.17	725,700.73	0.30	-634.43	-139.06	
11,082.00	10.18	228.74	10,976.33	721.46 S	820.83 W	503,792.94	725,700.47	0.30	-634.63	-139.04	
11,084.00	10.17	228.71	10,978.30	721.70 S	821.10 W	503,792.70	725,700.20	0.30	-634.84	-139.02	
11,086.00	10.17	228.69	10,980.27	721.93 S	821.36 W	503,792.47	725,699.94	0.30	-635.04	-138.99	
11,088.00	10.16	228.67	10,982.24	722.16 S	821.63 W	503,792.24	725,699.67	0.30	-635.25	-138.97	
11,090.00	10.16	228.65	10,984.21	722.40 S	821.89 W	503,792.00	725,699.41	0.30	-635.45	-138.95	
11,092.00	10.15	228.62	10,986.18	722.63 S	822.16 W	503,791.77	725,699.14	0.30	-635.66	-138.93	
11,094.00	10.15	228.60	10,988.15	722.86 S	822.42 W	503,791.54	725,698.88	0.30	-635.86	-138.91	
11,096.00	10.15	228.58	10,990.11	723.10 S	822.69 W	503,791.30	725,698.61	0.30	-636.07	-138.88	
11,098.00	10.14	228.56	10,992.08	723.33 S	822.95 W	503,791.07	725,698.35	0.30	-636.27	-138.86	
11,100.00	10.14	228.53	10,994.05	723.56 S	823.21 W	503,790.84	725,698.09	0.30	-636.48	-138.84	
11,102.00	10.13	228.51	10,996.02	723.79 S	823.48 W	503,790.61	725,697.82	0.30	-636.69	-138.82	
11,104.00	10.13	228.49	10,997.99	724.03 S	823.74 W	503,790.37	725,697.56	0.30	-636.89	-138.80	
11,106.00	10.12	228.47	10,999.96	724.26 S	824.00 W	503,790.14	725,697.30	0.30	-637.10	-138.77	
11,108.00	10.12	228.44	11,001.93	724.49 S	824.27 W	503,789.91	725,697.03	0.30	-637.30	-138.75	
11,110.00	10.11	228.42	11,003.90	724.73 S	824.53 W	503,789.67	725,696.77	0.30	-637.51	-138.73	
11,112.00	10.11	228.40	11,005.86	724.96 S	824.79 W	503,789.44	725,696.51	0.30	-637.71	-138.71	
11,114.00	10.10	228.38	11,007.83	725.19 S	825.06 W	503,789.21	725,696.24	0.30	-637.92	-138.68	
11,116.00	10.10	228.35	11,009.80	725.43 S	825.32 W	503,788.97	725,695.98	0.30	-638.12	-138.66	
11,118.00	10.10	228.33	11,011.77	725.66 S	825.58 W	503,788.74	725,695.72	0.30	-638.33	-138.64	
11,120.00	10.09	228.31	11,013.74	725.89 S	825.84 W	503,788.51	725,695.46	0.30	-638.53	-138.62	
11,122.00	10.09	228.29	11,015.71	726.13 S	826.10 W	503,788.27	725,695.20	0.30	-638.74	-138.60	
11,124.00	10.08	228.26	11,017.68	726.36 S	826.36 W	503,788.04	725,694.94	0.30	-638.94	-138.57	
11,126.00	10.08	228.24	11,019.65	726.59 S	826.63 W	503,787.81	725,694.67	0.30	-639.15	-138.55	
11,128.00	10.07	228.22	11,021.62	726.82 S	826.89 W	503,787.58	725,694.41	0.30	-639.35	-138.53	
11,130.00	10.07	228.20	11,023.59	727.06 S	827.15 W	503,787.34	725,694.15	0.30	-639.56	-138.51	
11,132.00	10.06	228.17	11,025.56	727.29 S	827.41 W	503,787.11	725,693.89	0.30	-639.77	-138.48	
11,134.00	10.06	228.15	11,027.52	727.52 S	827.67 W	503,786.88	725,693.63	0.30	-639.97	-138.46	Tie-in @ 11134'MD
11,136.00	10.07	228.14	11,029.49	727.76 S	827.93 W	503,786.64	725,693.37	0.49	-640.18	-11.49	
11,138.00	10.08	228.13	11,031.46	727.99 S	828.19 W	503,786.41	725,693.11	0.49	-640.38	-11.48	



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Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates (usft)		Map Coordinates (usft)		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing	Easting	Northing	Easting				
11,140.00	10.09	228.12	11,033.43	728.22 S	828.45 W	503,786.18	725,692.85	0.49	-640.59	-11.47	
11,142.00	10.10	228.11	11,035.40	728.46 S	828.71 W	503,785.94	725,692.59	0.49	-640.79	-11.46	
11,144.00	10.11	228.09	11,037.37	728.69 S	828.97 W	503,785.71	725,692.33	0.49	-641.00	-11.45	
11,146.00	10.12	228.08	11,039.34	728.93 S	829.23 W	503,785.47	725,692.07	0.49	-641.21	-11.44	
11,148.00	10.13	228.07	11,041.31	729.16 S	829.49 W	503,785.24	725,691.81	0.49	-641.42	-11.43	
11,150.00	10.14	228.06	11,043.28	729.40 S	829.76 W	503,785.00	725,691.54	0.49	-641.62	-11.42	
11,152.00	10.15	228.05	11,045.25	729.63 S	830.02 W	503,784.77	725,691.28	0.49	-641.83	-11.41	
11,154.00	10.16	228.04	11,047.21	729.87 S	830.28 W	503,784.53	725,691.02	0.49	-642.04	-11.40	
11,156.00	10.17	228.03	11,049.18	730.10 S	830.54 W	503,784.30	725,690.76	0.49	-642.25	-11.38	
11,158.00	10.18	228.02	11,051.15	730.34 S	830.81 W	503,784.06	725,690.49	0.49	-642.46	-11.37	
11,160.00	10.19	228.01	11,053.12	730.58 S	831.07 W	503,783.82	725,690.23	0.49	-642.66	-11.36	
11,162.00	10.20	227.99	11,055.09	730.81 S	831.33 W	503,783.59	725,689.97	0.49	-642.87	-11.35	
11,164.00	10.21	227.98	11,057.06	731.05 S	831.59 W	503,783.35	725,689.71	0.49	-643.08	-11.34	
11,166.00	10.21	227.97	11,059.03	731.29 S	831.86 W	503,783.11	725,689.44	0.49	-643.29	-11.33	
11,167.00	10.22	227.97	11,060.01	731.41 S	831.99 W	503,782.99	725,689.31	0.49	-643.40	-11.32	7 5/8" Liner
11,168.00	10.22	227.96	11,060.99	731.53 S	832.12 W	503,782.87	725,689.18	0.49	-643.50	-11.31	
11,170.00	10.23	227.95	11,062.96	731.76 S	832.38 W	503,782.64	725,688.92	0.49	-643.71	-11.31	
11,172.00	10.24	227.94	11,064.93	732.00 S	832.65 W	503,782.40	725,688.65	0.49	-643.92	-11.30	
11,174.00	10.25	227.93	11,066.90	732.24 S	832.91 W	503,782.16	725,688.39	0.49	-644.13	-11.29	
11,176.00	10.26	227.92	11,068.87	732.48 S	833.18 W	503,781.92	725,688.12	0.49	-644.34	-11.28	
11,178.00	10.27	227.91	11,070.83	732.72 S	833.44 W	503,781.68	725,687.86	0.49	-644.55	-11.27	
11,180.00	10.28	227.90	11,072.80	732.96 S	833.71 W	503,781.44	725,687.59	0.49	-644.76	-11.26	
11,182.00	10.29	227.89	11,074.77	733.20 S	833.97 W	503,781.20	725,687.33	0.49	-644.98	-11.24	
11,184.00	10.30	227.87	11,076.74	733.44 S	834.24 W	503,780.96	725,687.06	0.49	-645.19	-11.23	
11,186.00	10.31	227.86	11,078.71	733.68 S	834.50 W	503,780.72	725,686.80	0.49	-645.40	-11.22	
11,188.00	10.32	227.85	11,080.67	733.92 S	834.77 W	503,780.48	725,686.53	0.49	-645.61	-11.21	
11,190.00	10.33	227.84	11,082.64	734.16 S	835.03 W	503,780.24	725,686.27	0.49	-645.82	-11.20	
11,192.00	10.34	227.83	11,084.61	734.40 S	835.30 W	503,780.00	725,686.00	0.49	-646.04	-11.19	
11,194.00	10.35	227.82	11,086.58	734.64 S	835.57 W	503,779.76	725,685.73	0.49	-646.25	-11.18	
11,196.00	10.36	227.81	11,088.54	734.88 S	835.83 W	503,779.52	725,685.47	0.49	-646.46	-11.17	
11,198.00	10.37	227.80	11,090.51	735.12 S	836.10 W	503,779.28	725,685.20	0.49	-646.68	-11.16	First MWD Svy @ 11198'MD
11,200.00	10.38	228.42	11,092.48	735.36 S	836.37 W	503,779.04	725,684.93	5.59	-646.89	85.42	
11,202.00	10.39	229.04	11,094.44	735.60 S	836.64 W	503,778.80	725,684.66	5.59	-647.10	84.81	
11,204.00	10.40	229.65	11,096.41	735.84 S	836.91 W	503,778.56	725,684.39	5.59	-647.30	84.21	
11,206.00	10.42	230.27	11,098.38	736.07 S	837.19 W	503,778.33	725,684.11	5.59	-647.51	83.60	
11,208.00	10.43	230.88	11,100.35	736.30 S	837.47 W	503,778.10	725,683.83	5.59	-647.71	83.00	
11,210.00	10.44	231.49	11,102.31	736.53 S	837.75 W	503,777.87	725,683.55	5.59	-647.90	82.39	

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				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
11,212.00	10.46	232.10	11,104.28	736.75 S	838.04 W	503,777.65	725,683.26	5.59	-648.10	81.79	
11,214.00	10.48	232.71	11,106.25	736.97 S	838.32 W	503,777.43	725,682.98	5.59	-648.29	81.19	
11,216.00	10.50	233.31	11,108.21	737.19 S	838.61 W	503,777.21	725,682.69	5.59	-648.48	80.60	
11,218.00	10.52	233.91	11,110.18	737.41 S	838.91 W	503,776.99	725,682.39	5.59	-648.66	80.00	
11,220.00	10.54	234.51	11,112.15	737.62 S	839.20 W	503,776.78	725,682.10	5.59	-648.85	79.41	
11,222.00	10.56	235.11	11,114.11	737.83 S	839.50 W	503,776.57	725,681.80	5.59	-649.03	78.82	
11,224.00	10.58	235.71	11,116.08	738.04 S	839.81 W	503,776.36	725,681.49	5.59	-649.20	78.23	
11,226.00	10.61	236.30	11,118.04	738.25 S	840.11 W	503,776.15	725,681.19	5.59	-649.38	77.65	
11,228.00	10.63	236.89	11,120.01	738.45 S	840.42 W	503,775.95	725,680.88	5.59	-649.55	77.06	
11,230.00	10.66	237.48	11,121.98	738.65 S	840.73 W	503,775.75	725,680.57	5.59	-649.72	76.48	
11,232.00	10.69	238.06	11,123.94	738.85 S	841.04 W	503,775.55	725,680.26	5.59	-649.88	75.90	
11,234.00	10.72	238.64	11,125.91	739.04 S	841.36 W	503,775.36	725,679.94	5.59	-650.04	75.33	
11,236.00	10.75	239.22	11,127.87	739.23 S	841.68 W	503,775.17	725,679.62	5.59	-650.20	74.76	
11,238.00	10.78	239.80	11,129.84	739.42 S	842.00 W	503,774.98	725,679.30	5.59	-650.36	74.19	
11,240.00	10.81	240.37	11,131.80	739.61 S	842.32 W	503,774.79	725,678.98	5.59	-650.51	73.63	
11,242.00	10.84	240.94	11,133.76	739.79 S	842.65 W	503,774.61	725,678.65	5.59	-650.66	73.06	
11,244.00	10.88	241.50	11,135.73	739.98 S	842.98 W	503,774.42	725,678.32	5.59	-650.81	72.51	
11,246.00	10.91	242.06	11,137.69	740.15 S	843.31 W	503,774.25	725,677.99	5.59	-650.95	71.95	
11,248.00	10.95	242.62	11,139.66	740.33 S	843.65 W	503,774.07	725,677.65	5.59	-651.09	71.40	
11,250.00	10.99	243.18	11,141.62	740.50 S	843.99 W	503,773.90	725,677.31	5.59	-651.23	70.85	
11,252.00	11.02	243.73	11,143.58	740.67 S	844.33 W	503,773.73	725,676.97	5.59	-651.37	70.31	
11,254.00	11.06	244.27	11,145.55	740.84 S	844.68 W	503,773.56	725,676.62	5.59	-651.50	69.77	
11,256.00	11.10	244.81	11,147.51	741.01 S	845.02 W	503,773.39	725,676.28	5.59	-651.63	69.23	
11,258.00	11.14	245.35	11,149.47	741.17 S	845.37 W	503,773.23	725,675.93	5.59	-651.75	68.70	
11,260.00	11.19	245.89	11,151.43	741.33 S	845.72 W	503,773.07	725,675.58	5.59	-651.88	68.17	
11,262.00	11.23	246.42	11,153.40	741.49 S	846.08 W	503,772.91	725,675.22	5.59	-652.00	67.65	
11,264.00	11.27	246.95	11,155.36	741.64 S	846.44 W	503,772.76	725,674.86	5.59	-652.11	67.13	
11,266.00	11.32	247.47	11,157.32	741.79 S	846.80 W	503,772.61	725,674.50	5.59	-652.23	66.61	
11,268.00	11.36	247.99	11,159.28	741.94 S	847.16 W	503,772.46	725,674.14	5.59	-652.34	66.10	
11,270.00	11.41	248.50	11,161.24	742.09 S	847.53 W	503,772.31	725,673.77	5.59	-652.45	65.59	
11,272.00	11.46	249.01	11,163.20	742.23 S	847.90 W	503,772.17	725,673.40	5.59	-652.55	65.08	
11,274.00	11.51	249.52	11,165.16	742.37 S	848.27 W	503,772.03	725,673.03	5.59	-652.66	64.58	
11,276.00	11.56	250.02	11,167.12	742.51 S	848.65 W	503,771.89	725,672.65	5.59	-652.76	64.09	
11,278.00	11.61	250.52	11,169.08	742.65 S	849.03 W	503,771.75	725,672.27	5.59	-652.85	63.60	
11,280.00	11.66	251.01	11,171.04	742.78 S	849.41 W	503,771.62	725,671.89	5.59	-652.95	63.11	
11,282.00	11.71	251.50	11,173.00	742.91 S	849.79 W	503,771.49	725,671.51	5.59	-653.04	62.63	

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				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
11,284.00	11.76	251.98	11,174.95	743.04 S	850.18 W	503,771.36	725,671.12	5.59	-653.13	62.15	
11,286.00	11.81	252.46	11,176.91	743.16 S	850.57 W	503,771.24	725,670.73	5.59	-653.21	61.67	
11,288.00	11.87	252.94	11,178.87	743.28 S	850.96 W	503,771.12	725,670.34	5.59	-653.29	61.20	
11,290.00	11.92	253.41	11,180.83	743.40 S	851.35 W	503,771.00	725,669.95	5.59	-653.37	60.74	
11,292.00	11.98	253.88	11,182.78	743.52 S	851.75 W	503,770.88	725,669.55	5.59	-653.45	60.28	
11,294.00	12.12	255.07	11,184.74	743.63 S	852.15 W	503,770.77	725,669.15	14.15	-653.52	61.71	
11,296.00	12.26	256.23	11,186.69	743.74 S	852.56 W	503,770.66	725,668.74	14.15	-653.58	60.54	
11,298.00	12.40	257.36	11,188.65	743.83 S	852.98 W	503,770.57	725,668.32	14.15	-653.63	59.41	
11,300.00	12.56	258.47	11,190.60	743.92 S	853.40 W	503,770.48	725,667.90	14.15	-653.68	58.30	
11,302.00	12.71	259.55	11,192.55	744.01 S	853.83 W	503,770.39	725,667.47	14.15	-653.72	57.22	
11,304.00	12.87	260.61	11,194.50	744.08 S	854.26 W	503,770.32	725,667.04	14.15	-653.75	56.16	
11,306.00	13.03	261.64	11,196.45	744.15 S	854.71 W	503,770.25	725,666.59	14.15	-653.78	55.13	
11,308.00	13.20	262.64	11,198.40	744.21 S	855.16 W	503,770.19	725,666.14	14.15	-653.79	54.13	
11,310.00	13.37	263.62	11,200.35	744.27 S	855.61 W	503,770.13	725,665.69	14.15	-653.80	53.15	
11,312.00	13.55	264.58	11,202.29	744.32 S	856.08 W	503,770.08	725,665.22	14.15	-653.80	52.20	
11,314.00	13.73	265.51	11,204.24	744.36 S	856.55 W	503,770.04	725,664.75	14.15	-653.79	51.27	
11,316.00	13.91	266.41	11,206.18	744.39 S	857.02 W	503,770.01	725,664.28	14.15	-653.78	50.37	
11,318.00	14.10	267.30	11,208.12	744.42 S	857.51 W	503,769.98	725,663.79	14.15	-653.76	49.49	
11,320.00	14.28	268.16	11,210.06	744.44 S	858.00 W	503,769.96	725,663.30	14.15	-653.73	48.63	
11,322.00	14.48	269.00	11,211.99	744.45 S	858.49 W	503,769.95	725,662.81	14.15	-653.69	47.79	
11,324.00	14.67	269.81	11,213.93	744.46 S	859.00 W	503,769.94	725,662.30	14.15	-653.64	46.98	
11,326.00	14.87	270.61	11,215.86	744.45 S	859.51 W	503,769.95	725,661.79	14.15	-653.59	46.19	
11,328.00	15.07	271.39	11,217.80	744.44 S	860.02 W	503,769.96	725,661.28	14.15	-653.53	45.42	
11,330.00	15.27	272.14	11,219.73	744.43 S	860.55 W	503,769.97	725,660.75	14.15	-653.46	44.67	
11,332.00	15.48	272.88	11,221.65	744.41 S	861.07 W	503,769.99	725,660.23	14.15	-653.38	43.94	
11,334.00	15.68	273.59	11,223.58	744.37 S	861.61 W	503,770.03	725,659.69	14.15	-653.30	43.23	
11,336.00	15.89	274.29	11,225.51	744.34 S	862.15 W	503,770.06	725,659.15	14.15	-653.21	42.54	
11,338.00	16.10	274.97	11,227.43	744.29 S	862.70 W	503,770.11	725,658.60	14.15	-653.11	41.87	
11,340.00	16.32	275.64	11,229.35	744.24 S	863.26 W	503,770.16	725,658.04	14.15	-653.00	41.21	
11,342.00	16.53	276.29	11,231.27	744.18 S	863.82 W	503,770.22	725,657.48	14.15	-652.88	40.58	
11,344.00	16.75	276.92	11,233.18	744.12 S	864.39 W	503,770.28	725,656.91	14.15	-652.76	39.96	
11,346.00	16.97	277.53	11,235.10	744.04 S	864.97 W	503,770.36	725,656.33	14.15	-652.63	39.35	
11,348.00	17.19	278.13	11,237.01	743.96 S	865.55 W	503,770.44	725,655.75	14.15	-652.49	38.76	
11,350.00	17.42	278.72	11,238.92	743.88 S	866.14 W	503,770.52	725,655.16	14.15	-652.34	38.19	
11,352.00	17.64	279.29	11,240.83	743.78 S	866.73 W	503,770.62	725,654.57	14.15	-652.19	37.63	
11,354.00	17.87	279.84	11,242.73	743.68 S	867.33 W	503,770.72	725,653.97	14.15	-652.03	37.09	
11,356.00	18.10	280.38	11,244.63	743.57 S	867.94 W	503,770.83	725,653.36	14.15	-651.86	36.56	

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				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
11,358.00	18.33	280.91	11,246.53	743.46 S	868.56 W	503,770.94	725,652.74	14.15	-651.68	36.04	
11,360.00	18.56	281.43	11,248.43	743.33 S	869.18 W	503,771.07	725,652.12	14.15	-651.50	35.54	
11,362.00	18.79	281.94	11,250.32	743.20 S	869.80 W	503,771.20	725,651.50	14.15	-651.30	35.05	
11,364.00	19.02	282.43	11,252.22	743.07 S	870.44 W	503,771.33	725,650.86	14.15	-651.10	34.57	
11,366.00	19.26	282.91	11,254.11	742.92 S	871.08 W	503,771.48	725,650.22	14.15	-650.90	34.10	
11,368.00	19.50	283.38	11,255.99	742.77 S	871.72 W	503,771.63	725,649.58	14.15	-650.68	33.65	
11,370.00	19.73	283.84	11,257.88	742.61 S	872.38 W	503,771.79	725,648.92	14.15	-650.46	33.21	
11,372.00	19.97	284.29	11,259.76	742.45 S	873.03 W	503,771.95	725,648.27	14.15	-650.23	32.77	
11,374.00	20.21	284.73	11,261.64	742.28 S	873.70 W	503,772.12	725,647.60	14.15	-649.99	32.35	
11,376.00	20.45	285.15	11,263.51	742.10 S	874.37 W	503,772.30	725,646.93	14.15	-649.74	31.94	
11,378.00	20.69	285.57	11,265.38	741.91 S	875.05 W	503,772.49	725,646.25	14.15	-649.49	31.54	
11,380.00	20.94	285.98	11,267.25	741.72 S	875.73 W	503,772.68	725,645.57	14.15	-649.23	31.15	
11,382.00	21.18	286.38	11,269.12	741.52 S	876.42 W	503,772.88	725,644.88	14.15	-648.96	30.76	
11,384.00	21.42	286.78	11,270.98	741.31 S	877.12 W	503,773.09	725,644.18	14.15	-648.68	30.39	
11,386.00	21.67	287.16	11,272.84	741.10 S	877.82 W	503,773.30	725,643.48	14.15	-648.40	30.02	
11,388.00	21.70	287.71	11,274.70	740.88 S	878.53 W	503,773.52	725,642.77	10.20	-648.10	81.73	
11,390.00	21.73	288.25	11,276.56	740.65 S	879.23 W	503,773.75	725,642.07	10.20	-647.81	81.22	
11,392.00	21.77	288.79	11,278.42	740.41 S	879.93 W	503,773.99	725,641.37	10.20	-647.50	80.71	
11,394.00	21.80	289.34	11,280.27	740.17 S	880.63 W	503,774.23	725,640.67	10.20	-647.19	80.21	
11,396.00	21.84	289.88	11,282.13	739.92 S	881.33 W	503,774.48	725,639.97	10.20	-646.87	79.71	
11,398.00	21.88	290.41	11,283.99	739.66 S	882.03 W	503,774.74	725,639.27	10.20	-646.54	79.21	
11,400.00	21.92	290.95	11,285.84	739.40 S	882.73 W	503,775.00	725,638.57	10.20	-646.21	78.71	
11,402.00	21.96	291.48	11,287.70	739.13 S	883.43 W	503,775.27	725,637.87	10.20	-645.87	78.21	
11,404.00	22.01	292.02	11,289.55	738.85 S	884.12 W	503,775.55	725,637.18	10.20	-645.52	77.71	
11,406.00	22.05	292.55	11,291.41	738.57 S	884.82 W	503,775.83	725,636.48	10.20	-645.17	77.22	
11,408.00	22.10	293.07	11,293.26	738.28 S	885.51 W	503,776.12	725,635.79	10.20	-644.81	76.73	
11,410.00	22.15	293.60	11,295.11	737.98 S	886.20 W	503,776.42	725,635.10	10.20	-644.44	76.24	
11,412.00	22.20	294.12	11,296.97	737.67 S	886.89 W	503,776.73	725,634.41	10.20	-644.07	75.75	
11,414.00	22.25	294.64	11,298.82	737.36 S	887.58 W	503,777.04	725,633.72	10.20	-643.69	75.27	
11,416.00	22.31	295.16	11,300.67	737.04 S	888.27 W	503,777.36	725,633.03	10.20	-643.30	74.79	
11,418.00	22.36	295.68	11,302.52	736.71 S	888.96 W	503,777.69	725,632.34	10.20	-642.91	74.31	
11,420.00	22.42	296.19	11,304.37	736.38 S	889.64 W	503,778.02	725,631.66	10.20	-642.51	73.83	
11,422.00	22.48	296.70	11,306.21	736.04 S	890.32 W	503,778.36	725,630.98	10.20	-642.10	73.35	
11,424.00	22.54	297.21	11,308.06	735.69 S	891.01 W	503,778.71	725,630.29	10.20	-641.69	72.88	
11,426.00	22.60	297.72	11,309.91	735.34 S	891.69 W	503,779.06	725,629.61	10.20	-641.26	72.41	
11,428.00	22.67	298.22	11,311.76	734.98 S	892.37 W	503,779.42	725,628.93	10.20	-640.84	71.94	
11,430.00	22.73	298.72	11,313.60	734.61 S	893.05 W	503,779.79	725,628.25	10.20	-640.40	71.48	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
11,432.00	22.80	299.22	11,315.44	734.24 S	893.72 W	503,780.16	725,627.58	10.20	-639.96	71.02	
11,434.00	22.87	299.72	11,317.29	733.85 S	894.40 W	503,780.55	725,626.90	10.20	-639.51	70.56	
11,436.00	22.94	300.21	11,319.13	733.47 S	895.07 W	503,780.93	725,626.23	10.20	-639.06	70.10	
11,438.00	23.01	300.70	11,320.97	733.07 S	895.75 W	503,781.33	725,625.55	10.20	-638.59	69.65	
11,440.00	23.08	301.18	11,322.81	732.67 S	896.42 W	503,781.73	725,624.88	10.20	-638.13	69.20	
11,442.00	23.16	301.67	11,324.65	732.26 S	897.09 W	503,782.14	725,624.21	10.20	-637.65	68.75	
11,444.00	23.23	302.15	11,326.49	731.84 S	897.76 W	503,782.56	725,623.54	10.20	-637.17	68.30	
11,446.00	23.31	302.63	11,328.33	731.42 S	898.42 W	503,782.98	725,622.88	10.20	-636.68	67.86	
11,448.00	23.39	303.10	11,330.16	730.99 S	899.09 W	503,783.41	725,622.21	10.20	-636.18	67.42	
11,450.00	23.47	303.57	11,332.00	730.55 S	899.75 W	503,783.85	725,621.55	10.20	-635.68	66.99	
11,452.00	23.55	304.04	11,333.83	730.11 S	900.42 W	503,784.29	725,620.88	10.20	-635.17	66.56	
11,454.00	23.64	304.51	11,335.66	729.66 S	901.08 W	503,784.74	725,620.22	10.20	-634.66	66.13	
11,456.00	23.72	304.97	11,337.50	729.20 S	901.74 W	503,785.20	725,619.56	10.20	-634.14	65.70	
11,458.00	23.81	305.43	11,339.33	728.73 S	902.40 W	503,785.67	725,618.90	10.20	-633.61	65.28	
11,460.00	23.90	305.88	11,341.16	728.26 S	903.06 W	503,786.14	725,618.24	10.20	-633.07	64.86	
11,462.00	23.98	306.34	11,342.98	727.78 S	903.71 W	503,786.62	725,617.59	10.20	-632.53	64.44	
11,464.00	24.07	306.79	11,344.81	727.30 S	904.36 W	503,787.10	725,616.94	10.20	-631.98	64.02	
11,466.00	24.17	307.23	11,346.64	726.81 S	905.02 W	503,787.59	725,616.28	10.20	-631.43	63.61	
11,468.00	24.26	307.68	11,348.46	726.31 S	905.67 W	503,788.09	725,615.63	10.20	-630.86	63.21	
11,470.00	24.35	308.12	11,350.28	725.80 S	906.32 W	503,788.60	725,614.98	10.20	-630.29	62.80	
11,472.00	24.45	308.55	11,352.10	725.29 S	906.97 W	503,789.11	725,614.33	10.20	-629.72	62.40	
11,474.00	24.54	308.99	11,353.92	724.77 S	907.61 W	503,789.63	725,613.69	10.20	-629.14	62.00	
11,476.00	24.64	309.42	11,355.74	724.24 S	908.26 W	503,790.16	725,613.04	10.20	-628.55	61.61	
11,478.00	24.74	309.85	11,357.56	723.71 S	908.90 W	503,790.69	725,612.40	10.20	-627.95	61.22	
11,480.00	24.84	310.27	11,359.38	723.17 S	909.54 W	503,791.23	725,611.76	10.20	-627.35	60.83	
11,482.00	24.85	310.66	11,361.19	722.63 S	910.18 W	503,791.77	725,611.12	8.13	-626.74	88.01	
11,484.00	24.85	311.04	11,363.01	722.08 S	910.82 W	503,792.32	725,610.48	8.13	-626.13	87.66	
11,486.00	24.86	311.43	11,364.82	721.52 S	911.45 W	503,792.88	725,609.85	8.13	-625.52	87.31	
11,488.00	24.87	311.81	11,366.63	720.96 S	912.08 W	503,793.44	725,609.22	8.13	-624.90	86.95	
11,490.00	24.88	312.20	11,368.45	720.40 S	912.70 W	503,794.00	725,608.60	8.13	-624.27	86.60	
11,492.00	24.89	312.59	11,370.26	719.83 S	913.33 W	503,794.57	725,607.97	8.13	-623.65	86.25	
11,494.00	24.90	312.97	11,372.08	719.26 S	913.94 W	503,795.14	725,607.36	8.13	-623.02	85.91	
11,496.00	24.92	313.36	11,373.89	718.69 S	914.56 W	503,795.71	725,606.74	8.13	-622.38	85.56	
11,498.00	24.93	313.74	11,375.71	718.11 S	915.17 W	503,796.29	725,606.13	8.13	-621.74	85.21	
11,500.00	24.95	314.12	11,377.52	717.52 S	915.78 W	503,796.88	725,605.52	8.13	-621.10	84.86	
11,502.00	24.96	314.51	11,379.33	716.93 S	916.38 W	503,797.47	725,604.92	8.13	-620.45	84.51	



Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
11,504.00	24.98	314.89	11,381.15	716.34 S	916.98 W	503,798.06	725,604.32	8.13	-619.80	84.16	
11,506.00	25.00	315.27	11,382.96	715.74 S	917.58 W	503,798.66	725,603.72	8.13	-619.14	83.82	
11,508.00	25.02	315.65	11,384.77	715.14 S	918.17 W	503,799.26	725,603.13	8.13	-618.48	83.47	
11,510.00	25.04	316.04	11,386.58	714.53 S	918.76 W	503,799.87	725,602.54	8.13	-617.82	83.12	
11,512.00	25.06	316.42	11,388.39	713.92 S	919.34 W	503,800.48	725,601.96	8.13	-617.15	82.78	
11,514.00	25.08	316.80	11,390.21	713.30 S	919.93 W	503,801.10	725,601.37	8.13	-616.48	82.43	
11,516.00	25.10	317.18	11,392.02	712.68 S	920.51 W	503,801.72	725,600.79	8.13	-615.80	82.09	
11,518.00	25.13	317.55	11,393.83	712.06 S	921.08 W	503,802.34	725,600.22	8.13	-615.12	81.75	
11,520.00	25.15	317.93	11,395.64	711.43 S	921.65 W	503,802.97	725,599.65	8.13	-614.44	81.40	
11,522.00	25.18	318.31	11,397.45	710.80 S	922.22 W	503,803.60	725,599.08	8.13	-613.75	81.06	
11,524.00	25.20	318.69	11,399.26	710.16 S	922.78 W	503,804.24	725,598.52	8.13	-613.06	80.72	
11,526.00	25.23	319.06	11,401.07	709.52 S	923.34 W	503,804.88	725,597.96	8.13	-612.37	80.38	
11,528.00	25.26	319.44	11,402.88	708.87 S	923.90 W	503,805.53	725,597.40	8.13	-611.67	80.04	
11,530.00	25.29	319.81	11,404.69	708.22 S	924.45 W	503,806.18	725,596.85	8.13	-610.96	79.70	
11,532.00	25.32	320.19	11,406.49	707.56 S	925.00 W	503,806.84	725,596.30	8.13	-610.26	79.36	
11,534.00	25.35	320.56	11,408.30	706.91 S	925.55 W	503,807.49	725,595.75	8.13	-609.55	79.02	
11,536.00	25.38	320.93	11,410.11	706.24 S	926.09 W	503,808.16	725,595.21	8.13	-608.83	78.69	
11,538.00	25.42	321.30	11,411.92	705.57 S	926.63 W	503,808.83	725,594.67	8.13	-608.11	78.35	
11,540.00	25.45	321.67	11,413.72	704.90 S	927.16 W	503,809.50	725,594.14	8.13	-607.39	78.01	
11,542.00	25.49	322.04	11,415.53	704.23 S	927.70 W	503,810.17	725,593.60	8.13	-606.66	77.68	
11,544.00	25.52	322.41	11,417.33	703.55 S	928.22 W	503,810.85	725,593.08	8.13	-605.93	77.35	
11,546.00	25.56	322.77	11,419.14	702.86 S	928.75 W	503,811.54	725,592.55	8.13	-605.20	77.01	
11,548.00	25.60	323.14	11,420.94	702.17 S	929.27 W	503,812.23	725,592.03	8.13	-604.46	76.68	
11,550.00	25.64	323.51	11,422.74	701.48 S	929.78 W	503,812.92	725,591.52	8.13	-603.72	76.35	
11,552.00	25.67	323.87	11,424.55	700.78 S	930.30 W	503,813.62	725,591.00	8.13	-602.97	76.02	
11,554.00	25.72	324.23	11,426.35	700.08 S	930.81 W	503,814.32	725,590.49	8.13	-602.22	75.70	
11,556.00	25.76	324.59	11,428.15	699.37 S	931.31 W	503,815.03	725,589.99	8.13	-601.47	75.37	
11,558.00	25.80	324.96	11,429.95	698.66 S	931.81 W	503,815.74	725,589.49	8.13	-600.71	75.04	
11,560.00	25.84	325.31	11,431.75	697.95 S	932.31 W	503,816.45	725,588.99	8.13	-599.95	74.72	
11,562.00	25.89	325.67	11,433.55	697.23 S	932.81 W	503,817.17	725,588.49	8.13	-599.18	74.39	
11,564.00	25.93	326.03	11,435.35	696.50 S	933.30 W	503,817.90	725,588.00	8.13	-598.41	74.07	
11,566.00	25.98	326.39	11,437.15	695.78 S	933.78 W	503,818.62	725,587.52	8.13	-597.64	73.75	
11,568.00	26.02	326.74	11,438.95	695.04 S	934.27 W	503,819.36	725,587.03	8.13	-596.86	73.43	
11,570.00	26.07	327.10	11,440.74	694.31 S	934.74 W	503,820.09	725,586.56	8.13	-596.08	73.11	
11,572.00	26.12	327.45	11,442.54	693.57 S	935.22 W	503,820.83	725,586.08	8.13	-595.30	72.79	
11,574.00	26.17	327.80	11,444.34	692.82 S	935.69 W	503,821.58	725,585.61	8.13	-594.51	72.48	
11,576.00	26.24	328.28	11,446.13	692.08 S	936.16 W	503,822.32	725,585.14	11.21	-593.72	72.35	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

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				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
11,578.00	26.31	328.76	11,447.92	691.32 S	936.62 W	503,823.08	725,584.68	11.21	-592.92	71.92	
11,580.00	26.38	329.24	11,449.72	690.56 S	937.08 W	503,823.84	725,584.22	11.21	-592.12	71.49	
11,582.00	26.45	329.72	11,451.51	689.79 S	937.53 W	503,824.61	725,583.77	11.21	-591.31	71.06	
11,584.00	26.53	330.19	11,453.30	689.02 S	937.98 W	503,825.38	725,583.32	11.21	-590.50	70.63	
11,586.00	26.61	330.66	11,455.09	688.24 S	938.42 W	503,826.16	725,582.88	11.21	-589.68	70.21	
11,588.00	26.68	331.13	11,456.87	687.46 S	938.86 W	503,826.94	725,582.44	11.21	-588.85	69.79	
11,590.00	26.76	331.60	11,458.66	686.67 S	939.29 W	503,827.73	725,582.01	11.21	-588.02	69.37	
11,592.00	26.85	332.06	11,460.44	685.87 S	939.71 W	503,828.53	725,581.59	11.21	-587.19	68.95	
11,594.00	26.93	332.52	11,462.23	685.07 S	940.13 W	503,829.33	725,581.17	11.21	-586.35	68.54	
11,596.00	27.01	332.98	11,464.01	684.27 S	940.55 W	503,830.13	725,580.75	11.21	-585.51	68.13	
11,598.00	27.10	333.44	11,465.79	683.46 S	940.96 W	503,830.94	725,580.34	11.21	-584.66	67.72	
11,600.00	27.19	333.89	11,467.57	682.64 S	941.36 W	503,831.76	725,579.94	11.21	-583.80	67.32	
11,602.00	27.27	334.34	11,469.35	681.81 S	941.76 W	503,832.59	725,579.54	11.21	-582.94	66.91	
11,604.00	27.36	334.79	11,471.13	680.99 S	942.16 W	503,833.41	725,579.14	11.21	-582.08	66.51	
11,606.00	27.46	335.23	11,472.90	680.15 S	942.55 W	503,834.25	725,578.75	11.21	-581.21	66.11	
11,608.00	27.55	335.67	11,474.68	679.31 S	942.93 W	503,835.09	725,578.37	11.21	-580.33	65.72	
11,610.00	27.64	336.11	11,476.45	678.47 S	943.31 W	503,835.93	725,577.99	11.21	-579.45	65.33	
11,612.00	27.74	336.55	11,478.22	677.61 S	943.68 W	503,836.79	725,577.62	11.21	-578.57	64.94	
11,614.00	27.84	336.98	11,479.99	676.76 S	944.05 W	503,837.64	725,577.25	11.21	-577.68	64.55	
11,616.00	27.93	337.41	11,481.76	675.89 S	944.41 W	503,838.51	725,576.89	11.21	-576.79	64.17	
11,618.00	28.03	337.84	11,483.52	675.03 S	944.77 W	503,839.37	725,576.53	11.21	-575.89	63.79	
11,620.00	28.13	338.27	11,485.29	674.15 S	945.12 W	503,840.25	725,576.18	11.21	-574.98	63.41	
11,622.00	28.24	338.69	11,487.05	673.27 S	945.47 W	503,841.13	725,575.83	11.21	-574.07	63.03	
11,624.00	28.34	339.11	11,488.81	672.39 S	945.81 W	503,842.01	725,575.49	11.21	-573.16	62.66	
11,626.00	28.45	339.52	11,490.57	671.50 S	946.14 W	503,842.90	725,575.16	11.21	-572.24	62.29	
11,628.00	28.55	339.94	11,492.33	670.61 S	946.47 W	503,843.79	725,574.83	11.21	-571.31	61.93	
11,630.00	28.66	340.35	11,494.08	669.71 S	946.80 W	503,844.69	725,574.50	11.21	-570.39	61.56	
11,632.00	28.77	340.76	11,495.84	668.80 S	947.12 W	503,845.60	725,574.18	11.21	-569.45	61.20	
11,634.00	28.88	341.16	11,497.59	667.89 S	947.43 W	503,846.51	725,573.87	11.21	-568.51	60.84	
11,636.00	28.99	341.57	11,499.34	666.97 S	947.74 W	503,847.43	725,573.56	11.21	-567.57	60.49	
11,638.00	29.10	341.97	11,501.09	666.05 S	948.05 W	503,848.35	725,573.25	11.21	-566.62	60.14	
11,640.00	29.21	342.36	11,502.84	665.12 S	948.35 W	503,849.28	725,572.95	11.21	-565.67	59.79	
11,642.00	29.33	342.76	11,504.58	664.19 S	948.64 W	503,850.21	725,572.66	11.21	-564.71	59.44	
11,644.00	29.44	343.15	11,506.32	663.25 S	948.93 W	503,851.15	725,572.37	11.21	-563.75	59.10	
11,646.00	29.56	343.54	11,508.06	662.31 S	949.21 W	503,852.09	725,572.09	11.21	-562.78	58.75	
11,648.00	29.68	343.92	11,509.80	661.36 S	949.49 W	503,853.04	725,571.81	11.21	-561.81	58.42	
11,650.00	29.80	344.31	11,511.54	660.40 S	949.76 W	503,854.00	725,571.54	11.21	-560.83	58.08	



Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
11,652.00	29.92	344.69	11,513.27	659.44 S	950.02 W	503,854.96	725,571.28	11.21	-559.85	57.75	
11,654.00	30.04	345.06	11,515.01	658.48 S	950.28 W	503,855.92	725,571.02	11.21	-558.86	57.42	
11,656.00	30.16	345.44	11,516.74	657.51 S	950.54 W	503,856.89	725,570.76	11.21	-557.87	57.09	
11,658.00	30.29	345.81	11,518.46	656.53 S	950.79 W	503,857.87	725,570.51	11.21	-556.88	56.77	
11,660.00	30.41	346.18	11,520.19	655.55 S	951.03 W	503,858.85	725,570.27	11.21	-555.88	56.45	
11,662.00	30.54	346.55	11,521.91	654.57 S	951.27 W	503,859.83	725,570.03	11.21	-554.87	56.13	
11,664.00	30.66	346.91	11,523.64	653.58 S	951.51 W	503,860.82	725,569.79	11.21	-553.86	55.81	
11,666.00	30.79	347.27	11,525.35	652.58 S	951.74 W	503,861.82	725,569.56	11.21	-552.85	55.50	
11,668.00	30.83	347.63	11,527.07	651.58 S	951.96 W	503,862.82	725,569.34	9.47	-551.83	76.78	
11,670.00	30.88	347.99	11,528.79	650.58 S	952.17 W	503,863.82	725,569.13	9.47	-550.81	76.47	
11,672.00	30.92	348.35	11,530.51	649.57 S	952.39 W	503,864.83	725,568.91	9.47	-549.79	76.16	
11,674.00	30.97	348.70	11,532.22	648.56 S	952.59 W	503,865.84	725,568.71	9.47	-548.77	75.85	
11,676.00	31.02	349.06	11,533.94	647.55 S	952.79 W	503,866.85	725,568.51	9.47	-547.74	75.55	
11,678.00	31.07	349.41	11,535.65	646.54 S	952.98 W	503,867.86	725,568.32	9.47	-546.71	75.24	
11,680.00	31.12	349.77	11,537.36	645.52 S	953.17 W	503,868.88	725,568.13	9.47	-545.68	74.94	
11,682.00	31.17	350.12	11,539.07	644.51 S	953.35 W	503,869.89	725,567.95	9.47	-544.65	74.64	
11,684.00	31.22	350.47	11,540.78	643.49 S	953.52 W	503,870.91	725,567.78	9.47	-543.62	74.33	
11,686.00	31.27	350.82	11,542.49	642.46 S	953.69 W	503,871.94	725,567.61	9.47	-542.58	74.03	
11,688.00	31.33	351.17	11,544.20	641.44 S	953.85 W	503,872.96	725,567.45	9.47	-541.55	73.73	
11,690.00	31.38	351.52	11,545.91	640.41 S	954.01 W	503,873.99	725,567.29	9.47	-540.51	73.44	
11,692.00	31.44	351.87	11,547.62	639.38 S	954.16 W	503,875.02	725,567.14	9.47	-539.47	73.14	
11,694.00	31.49	352.21	11,549.32	638.34 S	954.31 W	503,876.06	725,566.99	9.47	-538.42	72.84	
11,696.00	31.55	352.56	11,551.03	637.31 S	954.44 W	503,877.09	725,566.86	9.47	-537.38	72.55	
11,698.00	31.61	352.90	11,552.73	636.27 S	954.58 W	503,878.13	725,566.72	9.47	-536.33	72.25	
11,700.00	31.67	353.25	11,554.44	635.22 S	954.70 W	503,879.18	725,566.60	9.47	-535.28	71.96	
11,702.00	31.73	353.59	11,556.14	634.18 S	954.82 W	503,880.22	725,566.48	9.47	-534.23	71.67	
11,704.00	31.79	353.93	11,557.84	633.13 S	954.94 W	503,881.27	725,566.36	9.47	-533.18	71.38	
11,706.00	31.85	354.27	11,559.54	632.09 S	955.05 W	503,882.31	725,566.25	9.47	-532.12	71.09	
11,708.00	31.91	354.61	11,561.24	631.03 S	955.15 W	503,883.37	725,566.15	9.47	-531.07	70.80	
11,710.00	31.98	354.94	11,562.93	629.98 S	955.25 W	503,884.42	725,566.05	9.47	-530.01	70.51	
11,712.00	32.04	355.28	11,564.63	628.92 S	955.34 W	503,885.48	725,565.96	9.47	-528.95	70.22	
11,714.00	32.11	355.61	11,566.32	627.87 S	955.42 W	503,886.53	725,565.88	9.47	-527.89	69.94	
11,716.00	32.17	355.95	11,568.02	626.80 S	955.50 W	503,887.60	725,565.80	9.47	-526.82	69.66	
11,718.00	32.24	356.28	11,569.71	625.74 S	955.57 W	503,888.66	725,565.73	9.47	-525.76	69.37	
11,720.00	32.31	356.61	11,571.40	624.68 S	955.64 W	503,889.72	725,565.66	9.47	-524.69	69.09	
11,722.00	32.38	356.94	11,573.09	623.61 S	955.70 W	503,890.79	725,565.60	9.47	-523.62	68.81	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
11,724.00	32.45	357.27	11,574.78	622.54 S	955.75 W	503,891.86	725,565.55	9.47	-522.55	68.53	
11,726.00	32.52	357.60	11,576.47	621.46 S	955.80 W	503,892.94	725,565.50	9.47	-521.48	68.26	
11,728.00	32.59	357.92	11,578.15	620.39 S	955.84 W	503,894.01	725,565.46	9.47	-520.41	67.98	
11,730.00	32.66	358.25	11,579.84	619.31 S	955.88 W	503,895.09	725,565.42	9.47	-519.33	67.71	
11,732.00	32.73	358.57	11,581.52	618.23 S	955.91 W	503,896.17	725,565.39	9.47	-518.25	67.43	
11,734.00	32.81	358.89	11,583.20	617.15 S	955.93 W	503,897.25	725,565.37	9.47	-517.17	67.16	
11,736.00	32.88	359.21	11,584.88	616.06 S	955.95 W	503,898.34	725,565.35	9.47	-516.09	66.89	
11,738.00	32.96	359.53	11,586.56	614.98 S	955.96 W	503,899.42	725,565.34	9.47	-515.01	66.62	
11,740.00	33.03	359.85	11,588.24	613.89 S	955.97 W	503,900.51	725,565.33	9.47	-513.93	66.35	
11,742.00	33.11	0.17	11,589.91	612.80 S	955.97 W	503,901.60	725,565.33	9.47	-512.84	66.08	
11,744.00	33.19	0.48	11,591.59	611.70 S	955.96 W	503,902.70	725,565.34	9.47	-511.75	65.82	
11,746.00	33.27	0.80	11,593.26	610.61 S	955.95 W	503,903.79	725,565.35	9.47	-510.67	65.56	
11,748.00	33.35	1.11	11,594.93	609.51 S	955.93 W	503,904.89	725,565.37	9.47	-509.57	65.29	
11,750.00	33.43	1.42	11,596.60	608.41 S	955.91 W	503,905.99	725,565.39	9.47	-508.48	65.03	
11,752.00	33.51	1.73	11,598.27	607.31 S	955.88 W	503,907.09	725,565.42	9.47	-507.39	64.77	
11,754.00	33.59	2.04	11,599.94	606.20 S	955.84 W	503,908.20	725,565.46	9.47	-506.29	64.51	
11,756.00	33.67	2.35	11,601.60	605.09 S	955.80 W	503,909.31	725,565.50	9.47	-505.20	64.25	
11,758.00	33.76	2.66	11,603.27	603.99 S	955.75 W	503,910.41	725,565.55	9.47	-504.10	64.00	
11,760.00	33.84	2.96	11,604.93	602.87 S	955.69 W	503,911.53	725,565.61	9.47	-503.00	63.74	
11,762.00	33.97	2.95	11,606.59	601.76 S	955.64 W	503,912.64	725,565.66	6.65	-501.90	-2.81	
11,764.00	34.11	2.94	11,608.25	600.64 S	955.58 W	503,913.76	725,565.72	6.65	-500.79	-2.80	
11,766.00	34.24	2.93	11,609.90	599.52 S	955.52 W	503,914.88	725,565.78	6.65	-499.68	-2.79	
11,768.00	34.37	2.91	11,611.55	598.39 S	955.46 W	503,916.01	725,565.84	6.65	-498.56	-2.79	
11,770.00	34.50	2.90	11,613.20	597.27 S	955.41 W	503,917.13	725,565.89	6.65	-497.45	-2.78	
11,772.00	34.64	2.89	11,614.85	596.13 S	955.35 W	503,918.27	725,565.95	6.65	-496.32	-2.77	
11,774.00	34.77	2.88	11,616.49	594.99 S	955.29 W	503,919.41	725,566.01	6.65	-495.20	-2.76	
11,776.00	34.90	2.87	11,618.13	593.85 S	955.23 W	503,920.55	725,566.07	6.65	-494.07	-2.75	
11,778.00	35.04	2.86	11,619.77	592.71 S	955.18 W	503,921.69	725,566.12	6.65	-492.94	-2.74	
11,780.00	35.17	2.85	11,621.41	591.56 S	955.12 W	503,922.84	725,566.18	6.65	-491.80	-2.73	
11,782.00	35.30	2.84	11,623.04	590.41 S	955.06 W	503,923.99	725,566.24	6.65	-490.66	-2.72	
11,784.00	35.43	2.82	11,624.67	589.25 S	955.01 W	503,925.15	725,566.29	6.65	-489.51	-2.71	
11,786.00	35.57	2.81	11,626.30	588.09 S	954.95 W	503,926.31	725,566.35	6.65	-488.37	-2.70	
11,788.00	35.70	2.80	11,627.93	586.93 S	954.89 W	503,927.47	725,566.41	6.65	-487.21	-2.69	
11,790.00	35.83	2.79	11,629.55	585.76 S	954.83 W	503,928.64	725,566.47	6.65	-486.06	-2.69	
11,792.00	35.97	2.78	11,631.17	584.59 S	954.78 W	503,929.81	725,566.52	6.65	-484.90	-2.68	
11,794.00	36.10	2.77	11,632.79	583.41 S	954.72 W	503,930.99	725,566.58	6.65	-483.74	-2.67	
11,796.00	36.23	2.76	11,634.40	582.23 S	954.66 W	503,932.17	725,566.64	6.65	-482.57	-2.66	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
11,798.00	36.36	2.75	11,636.01	581.05 S	954.61 W	503,933.35	725,566.69	6.65	-481.40	-2.65	
11,800.00	36.50	2.74	11,637.62	579.87 S	954.55 W	503,934.53	725,566.75	6.65	-480.22	-2.64	
11,802.00	36.63	2.73	11,639.23	578.68 S	954.49 W	503,935.72	725,566.81	6.65	-479.05	-2.63	
11,804.00	36.76	2.72	11,640.83	577.48 S	954.44 W	503,936.92	725,566.86	6.65	-477.86	-2.63	
11,806.00	36.90	2.71	11,642.43	576.28 S	954.38 W	503,938.12	725,566.92	6.65	-476.68	-2.62	
11,808.00	37.03	2.70	11,644.03	575.08 S	954.32 W	503,939.32	725,566.98	6.65	-475.49	-2.61	
11,810.00	37.16	2.69	11,645.63	573.88 S	954.27 W	503,940.52	725,567.03	6.65	-474.30	-2.60	
11,812.00	37.29	2.68	11,647.22	572.67 S	954.21 W	503,941.73	725,567.09	6.65	-473.10	-2.59	
11,814.00	37.43	2.67	11,648.81	571.46 S	954.15 W	503,942.94	725,567.15	6.65	-471.90	-2.59	
11,816.00	37.56	2.66	11,650.40	570.24 S	954.10 W	503,944.16	725,567.20	6.65	-470.69	-2.58	
11,818.00	37.69	2.65	11,651.98	569.02 S	954.04 W	503,945.38	725,567.26	6.65	-469.49	-2.57	
11,820.00	37.83	2.64	11,653.56	567.80 S	953.98 W	503,946.60	725,567.32	6.65	-468.28	-2.56	
11,822.00	37.96	2.63	11,655.14	566.57 S	953.93 W	503,947.83	725,567.37	6.65	-467.06	-2.56	
11,824.00	38.09	2.62	11,656.72	565.34 S	953.87 W	503,949.06	725,567.43	6.65	-465.84	-2.55	
11,826.00	38.22	2.61	11,658.29	564.11 S	953.81 W	503,950.29	725,567.49	6.65	-464.62	-2.54	
11,828.00	38.36	2.60	11,659.86	562.87 S	953.76 W	503,951.53	725,567.54	6.65	-463.39	-2.53	
11,830.00	38.49	2.59	11,661.43	561.63 S	953.70 W	503,952.77	725,567.60	6.65	-462.16	-2.53	
11,832.00	38.62	2.58	11,662.99	560.38 S	953.64 W	503,954.02	725,567.66	6.65	-460.93	-2.52	
11,834.00	38.76	2.57	11,664.55	559.13 S	953.59 W	503,955.27	725,567.71	6.65	-459.69	-2.51	
11,836.00	38.89	2.57	11,666.11	557.88 S	953.53 W	503,956.52	725,567.77	6.65	-458.45	-2.50	
11,838.00	39.02	2.56	11,667.66	556.62 S	953.48 W	503,957.78	725,567.82	6.65	-457.21	-2.50	
11,840.00	39.15	2.55	11,669.22	555.36 S	953.42 W	503,959.04	725,567.88	6.65	-455.96	-2.49	
11,842.00	39.29	2.54	11,670.77	554.10 S	953.36 W	503,960.30	725,567.94	6.65	-454.71	-2.48	
11,844.00	39.42	2.53	11,672.31	552.83 S	953.31 W	503,961.57	725,567.99	6.65	-453.46	-2.47	
11,846.00	39.55	2.52	11,673.86	551.56 S	953.25 W	503,962.84	725,568.05	6.65	-452.20	-2.47	
11,848.00	39.68	2.51	11,675.40	550.29 S	953.19 W	503,964.11	725,568.11	6.65	-450.94	-2.46	
11,850.00	39.82	2.50	11,676.93	549.01 S	953.14 W	503,965.39	725,568.16	6.65	-449.67	-2.45	
11,852.00	39.95	2.49	11,678.47	547.73 S	953.08 W	503,966.67	725,568.22	6.65	-448.40	-2.45	
11,854.00	40.08	2.48	11,680.00	546.45 S	953.03 W	503,967.95	725,568.27	6.65	-447.13	-2.44	
11,856.00	40.27	2.40	11,681.53	545.16 S	952.97 W	503,969.24	725,568.33	9.62	-445.85	-17.18	
11,858.00	40.50	2.23	11,683.05	543.86 S	952.92 W	503,970.54	725,568.38	12.93	-444.57	-24.63	
11,860.00	40.74	2.07	11,684.57	542.56 S	952.87 W	503,971.84	725,568.43	12.93	-443.28	-24.51	
11,862.00	40.97	1.90	11,686.08	541.25 S	952.83 W	503,973.15	725,568.47	12.93	-441.98	-24.38	
11,864.00	41.21	1.74	11,687.59	539.94 S	952.78 W	503,974.46	725,568.52	12.93	-440.68	-24.26	
11,866.00	41.45	1.58	11,689.09	538.62 S	952.75 W	503,975.78	725,568.55	12.93	-439.37	-24.14	
11,868.00	41.68	1.42	11,690.59	537.29 S	952.71 W	503,977.11	725,568.59	12.93	-438.06	-24.02	
11,870.00	41.92	1.27	11,692.08	535.96 S	952.68 W	503,978.44	725,568.62	12.93	-436.73	-23.90	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
11,872.00	42.16	1.11	11,693.57	534.62 S	952.65 W	503,979.78	725,568.65	12.93	-435.40	-23.78	
11,874.00	42.39	0.96	11,695.05	533.28 S	952.63 W	503,981.12	725,568.67	12.93	-434.07	-23.67	
11,876.00	42.63	0.81	11,696.52	531.92 S	952.61 W	503,982.48	725,568.69	12.93	-432.73	-23.55	
11,878.00	42.87	0.65	11,697.99	530.57 S	952.59 W	503,983.83	725,568.71	12.93	-431.38	-23.44	
11,880.00	43.10	0.50	11,699.45	529.20 S	952.58 W	503,985.20	725,568.72	12.93	-430.02	-23.33	
11,882.00	43.34	0.36	11,700.91	527.83 S	952.57 W	503,986.57	725,568.73	12.93	-428.66	-23.22	
11,884.00	43.58	0.21	11,702.36	526.46 S	952.56 W	503,987.94	725,568.74	12.93	-427.29	-23.11	
11,886.00	43.82	0.06	11,703.81	525.08 S	952.55 W	503,989.32	725,568.75	12.93	-425.92	-23.01	
11,888.00	44.06	359.92	11,705.25	523.69 S	952.56 W	503,990.71	725,568.74	12.93	-424.54	-22.90	
11,890.00	44.29	359.77	11,706.68	522.30 S	952.56 W	503,992.10	725,568.74	12.93	-423.15	-22.80	
11,892.00	44.53	359.63	11,708.11	520.90 S	952.57 W	503,993.50	725,568.73	12.93	-421.76	-22.69	
11,894.00	44.77	359.49	11,709.53	519.49 S	952.58 W	503,994.91	725,568.72	12.93	-420.36	-22.59	
11,896.00	45.01	359.35	11,710.95	518.08 S	952.59 W	503,996.32	725,568.71	12.93	-418.95	-22.49	
11,898.00	45.25	359.21	11,712.36	516.66 S	952.61 W	503,997.74	725,568.69	12.93	-417.54	-22.39	
11,900.00	45.49	359.07	11,713.77	515.24 S	952.63 W	503,999.16	725,568.67	12.93	-416.12	-22.29	
11,902.00	45.73	358.94	11,715.16	513.81 S	952.66 W	504,000.59	725,568.64	12.93	-414.70	-22.20	
11,904.00	45.97	358.80	11,716.56	512.37 S	952.68 W	504,002.03	725,568.62	12.93	-413.27	-22.10	
11,906.00	46.21	358.67	11,717.94	510.93 S	952.72 W	504,003.47	725,568.58	12.93	-411.83	-22.01	
11,908.00	46.45	358.54	11,719.33	509.49 S	952.75 W	504,004.91	725,568.55	12.93	-410.39	-21.91	
11,910.00	46.69	358.40	11,720.70	508.04 S	952.79 W	504,006.36	725,568.51	12.93	-408.94	-21.82	
11,912.00	46.93	358.27	11,722.07	506.58 S	952.83 W	504,007.82	725,568.47	12.93	-407.49	-21.73	
11,914.00	47.17	358.14	11,723.43	505.11 S	952.88 W	504,009.29	725,568.42	12.93	-406.03	-21.64	
11,916.00	47.41	358.01	11,724.79	503.65 S	952.93 W	504,010.75	725,568.37	12.93	-404.56	-21.55	
11,918.00	47.65	357.89	11,726.14	502.17 S	952.98 W	504,012.23	725,568.32	12.93	-403.09	-21.47	
11,920.00	47.89	357.76	11,727.48	500.69 S	953.04 W	504,013.71	725,568.26	12.93	-401.61	-21.38	
11,922.00	48.13	357.63	11,728.82	499.21 S	953.10 W	504,015.19	725,568.20	12.93	-400.13	-21.29	
11,924.00	48.37	357.51	11,730.15	497.72 S	953.16 W	504,016.68	725,568.14	12.93	-398.64	-21.21	
11,926.00	48.61	357.38	11,731.48	496.22 S	953.23 W	504,018.18	725,568.07	12.93	-397.14	-21.13	
11,928.00	48.86	357.26	11,732.80	494.72 S	953.30 W	504,019.68	725,568.00	12.93	-395.64	-21.04	
11,930.00	49.10	357.14	11,734.11	493.21 S	953.37 W	504,021.19	725,567.93	12.93	-394.13	-20.96	
11,932.00	49.34	357.02	11,735.42	491.70 S	953.45 W	504,022.70	725,567.85	12.93	-392.62	-20.88	
11,934.00	49.58	356.89	11,736.72	490.18 S	953.53 W	504,024.22	725,567.77	12.93	-391.10	-20.80	
11,936.00	49.82	356.78	11,738.01	488.66 S	953.61 W	504,025.74	725,567.69	12.93	-389.58	-20.73	
11,938.00	50.07	356.66	11,739.30	487.13 S	953.70 W	504,027.27	725,567.60	12.93	-388.05	-20.65	
11,940.00	50.31	356.54	11,740.58	485.60 S	953.79 W	504,028.80	725,567.51	12.93	-386.51	-20.57	
11,942.00	50.55	356.42	11,741.85	484.06 S	953.89 W	504,030.34	725,567.41	12.93	-384.97	-20.50	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
11,944.00	50.79	356.30	11,743.12	482.51 S	953.98 W	504,031.89	725,567.32	12.93	-383.43	-20.42	
11,946.00	51.03	356.19	11,744.38	480.96 S	954.09 W	504,033.44	725,567.21	12.93	-381.88	-20.35	
11,948.00	51.28	356.07	11,745.63	479.41 S	954.19 W	504,034.99	725,567.11	12.93	-380.32	-20.27	SLC @ 11,948'MD
11,950.00	51.52	355.96	11,746.88	477.85 S	954.30 W	504,036.55	725,567.00	12.93	-378.76	-20.20	
11,952.00	51.68	355.88	11,748.12	476.29 S	954.41 W	504,038.11	725,566.89	8.39	-377.19	-22.26	
11,954.00	51.83	355.80	11,749.36	474.72 S	954.52 W	504,039.68	725,566.78	8.39	-375.62	-22.21	
11,956.00	51.99	355.72	11,750.60	473.15 S	954.64 W	504,041.25	725,566.66	8.39	-374.05	-22.16	
11,958.00	52.14	355.64	11,751.83	471.58 S	954.76 W	504,042.82	725,566.54	8.39	-372.47	-22.11	
11,960.00	52.30	355.56	11,753.05	470.00 S	954.88 W	504,044.40	725,566.42	8.39	-370.89	-22.06	
11,962.00	52.45	355.48	11,754.27	468.42 S	955.00 W	504,045.98	725,566.30	8.39	-369.31	-22.01	
11,964.00	52.61	355.40	11,755.49	466.84 S	955.13 W	504,047.56	725,566.17	8.39	-367.72	-21.96	
11,966.00	52.76	355.32	11,756.70	465.25 S	955.26 W	504,049.15	725,566.04	8.39	-366.13	-21.91	
11,968.00	52.92	355.24	11,757.91	463.67 S	955.39 W	504,050.73	725,565.91	8.39	-364.54	-21.87	
11,970.00	53.08	355.17	11,759.11	462.07 S	955.52 W	504,052.33	725,565.78	8.39	-362.94	-21.82	
11,972.00	53.23	355.09	11,760.31	460.48 S	955.66 W	504,053.92	725,565.64	8.39	-361.34	-21.77	
11,974.00	53.39	355.01	11,761.51	458.88 S	955.80 W	504,055.52	725,565.50	8.39	-359.74	-21.73	
11,976.00	53.54	354.93	11,762.70	457.28 S	955.94 W	504,057.12	725,565.36	8.39	-358.13	-21.68	
11,978.00	53.70	354.86	11,763.88	455.68 S	956.08 W	504,058.72	725,565.22	8.39	-356.52	-21.63	
11,980.00	53.85	354.78	11,765.07	454.07 S	956.23 W	504,060.33	725,565.07	8.39	-354.90	-21.59	
11,982.00	54.01	354.70	11,766.24	452.46 S	956.38 W	504,061.94	725,564.92	8.39	-353.29	-21.54	
11,984.00	54.17	354.63	11,767.42	450.85 S	956.53 W	504,063.55	725,564.77	8.39	-351.67	-21.50	
11,986.00	54.32	354.55	11,768.59	449.23 S	956.68 W	504,065.17	725,564.62	8.39	-350.05	-21.45	
11,988.00	54.48	354.48	11,769.75	447.61 S	956.84 W	504,066.79	725,564.46	8.39	-348.42	-21.41	
11,990.00	54.64	354.40	11,770.91	445.99 S	956.99 W	504,068.41	725,564.31	8.39	-346.79	-21.37	
11,992.00	54.79	354.33	11,772.06	444.37 S	957.15 W	504,070.03	725,564.15	8.39	-345.16	-21.32	
11,994.00	54.95	354.25	11,773.22	442.74 S	957.32 W	504,071.66	725,563.98	8.39	-343.52	-21.28	
11,996.00	55.10	354.18	11,774.36	441.11 S	957.48 W	504,073.29	725,563.82	8.39	-341.88	-21.24	
11,998.00	55.26	354.11	11,775.50	439.48 S	957.65 W	504,074.92	725,563.65	8.39	-340.24	-21.19	
12,000.00	55.42	354.03	11,776.64	437.84 S	957.82 W	504,076.56	725,563.48	8.39	-338.60	-21.15	
12,002.00	55.57	353.96	11,777.77	436.20 S	957.99 W	504,078.20	725,563.31	8.39	-336.95	-21.11	
12,004.00	55.73	353.89	11,778.90	434.56 S	958.17 W	504,079.84	725,563.13	8.39	-335.30	-21.07	
12,006.00	55.89	353.81	11,780.03	432.91 S	958.34 W	504,081.49	725,562.96	8.39	-333.64	-21.03	
12,008.00	56.04	353.74	11,781.15	431.27 S	958.52 W	504,083.13	725,562.78	8.39	-331.98	-20.99	
12,010.00	56.20	353.67	11,782.26	429.62 S	958.71 W	504,084.78	725,562.59	8.39	-330.32	-20.95	
12,012.00	56.36	353.60	11,783.37	427.96 S	958.89 W	504,086.44	725,562.41	8.39	-328.66	-20.91	
12,014.00	56.51	353.52	11,784.48	426.31 S	959.08 W	504,088.09	725,562.22	8.39	-326.99	-20.87	
12,016.00	56.67	353.45	11,785.58	424.65 S	959.27 W	504,089.75	725,562.03	8.39	-325.33	-20.83	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

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				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
12,018.00	56.83	353.38	11,786.67	422.99 S	959.46 W	504,091.41	725,561.84	8.39	-323.65	-20.79	
12,020.00	56.98	353.31	11,787.77	421.32 S	959.65 W	504,093.08	725,561.65	8.39	-321.98	-20.75	
12,022.00	57.14	353.24	11,788.85	419.65 S	959.85 W	504,094.75	725,561.45	8.39	-320.30	-20.71	
12,024.00	57.30	353.17	11,789.94	417.98 S	960.05 W	504,096.42	725,561.25	8.39	-318.62	-20.67	
12,026.00	57.46	353.10	11,791.02	416.31 S	960.25 W	504,098.09	725,561.05	8.39	-316.93	-20.63	
12,028.00	57.61	353.03	11,792.09	414.64 S	960.45 W	504,099.76	725,560.85	8.39	-315.25	-20.60	
12,030.00	57.77	352.96	11,793.16	412.96 S	960.66 W	504,101.44	725,560.64	8.39	-313.56	-20.56	
12,032.00	57.93	352.89	11,794.22	411.28 S	960.87 W	504,103.12	725,560.43	8.39	-311.86	-20.52	
12,034.00	58.08	352.82	11,795.28	409.60 S	961.08 W	504,104.80	725,560.22	8.39	-310.17	-20.48	
12,036.00	58.24	352.75	11,796.34	407.91 S	961.29 W	504,106.49	725,560.01	8.39	-308.47	-20.45	
12,038.00	58.40	352.68	11,797.39	406.22 S	961.51 W	504,108.18	725,559.79	8.39	-306.77	-20.41	
12,040.00	58.56	352.62	11,798.43	404.53 S	961.73 W	504,109.87	725,559.57	8.39	-305.06	-20.37	
12,042.00	58.71	352.55	11,799.47	402.84 S	961.95 W	504,111.56	725,559.35	8.39	-303.36	-20.34	
12,044.00	58.87	352.48	11,800.51	401.14 S	962.17 W	504,113.26	725,559.13	8.39	-301.65	-20.30	
12,046.00	58.90	352.45	11,801.54	399.44 S	962.39 W	504,114.96	725,558.91	2.21	-299.94	-38.15	
12,048.00	58.94	352.42	11,802.58	397.75 S	962.62 W	504,116.65	725,558.68	2.21	-298.22	-38.14	
12,050.00	58.97	352.38	11,803.61	396.05 S	962.85 W	504,118.35	725,558.45	2.21	-296.51	-38.12	
12,052.00	59.01	352.35	11,804.64	394.35 S	963.07 W	504,120.05	725,558.23	2.21	-294.80	-38.10	
12,054.00	59.04	352.32	11,805.67	392.65 S	963.30 W	504,121.75	725,558.00	2.21	-293.08	-38.09	
12,056.00	59.08	352.29	11,806.70	390.95 S	963.53 W	504,123.45	725,557.77	2.21	-291.37	-38.07	
12,058.00	59.11	352.26	11,807.72	389.25 S	963.76 W	504,125.15	725,557.54	2.21	-289.65	-38.05	
12,060.00	59.15	352.23	11,808.75	387.55 S	963.99 W	504,126.85	725,557.31	2.21	-287.94	-38.04	
12,062.00	59.18	352.19	11,809.77	385.85 S	964.23 W	504,128.55	725,557.07	2.21	-286.22	-38.02	
12,064.00	59.22	352.16	11,810.80	384.14 S	964.46 W	504,130.26	725,556.84	2.21	-284.50	-38.01	
12,066.00	59.25	352.13	11,811.82	382.44 S	964.70 W	504,131.96	725,556.60	2.21	-282.79	-37.99	
12,068.00	59.29	352.10	11,812.84	380.74 S	964.93 W	504,133.66	725,556.37	2.21	-281.07	-37.97	
12,070.00	59.32	352.07	11,813.86	379.04 S	965.17 W	504,135.36	725,556.13	2.21	-279.35	-37.96	100HLC @ 12,070'MD
12,072.00	59.36	352.04	11,814.88	377.33 S	965.41 W	504,137.07	725,555.89	2.21	-277.63	-37.94	
12,074.00	59.39	352.00	11,815.90	375.63 S	965.64 W	504,138.77	725,555.66	2.21	-275.91	-37.93	
12,076.00	59.43	351.97	11,816.92	373.92 S	965.88 W	504,140.48	725,555.42	2.21	-274.19	-37.91	
12,078.00	59.46	351.94	11,817.94	372.22 S	966.13 W	504,142.18	725,555.17	2.21	-272.47	-37.89	
12,080.00	59.50	351.91	11,818.95	370.51 S	966.37 W	504,143.89	725,554.93	2.21	-270.75	-37.88	
12,082.00	59.53	351.88	11,819.97	368.81 S	966.61 W	504,145.59	725,554.69	2.21	-269.03	-37.86	
12,084.00	59.57	351.85	11,820.98	367.10 S	966.85 W	504,147.30	725,554.45	2.21	-267.30	-37.84	
12,086.00	59.60	351.82	11,821.99	365.39 S	967.10 W	504,149.01	725,554.20	2.21	-265.58	-37.83	
12,088.00	59.64	351.78	11,823.01	363.68 S	967.35 W	504,150.72	725,553.95	2.21	-263.86	-37.81	
12,090.00	59.67	351.75	11,824.02	361.98 S	967.59 W	504,152.42	725,553.71	2.21	-262.13	-37.80	

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				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
12,092.00	59.71	351.72	11,825.03	360.27 S	967.84 W	504,154.13	725,553.46	2.21	-260.41	-37.78	
12,094.00	59.74	351.69	11,826.03	358.56 S	968.09 W	504,155.84	725,553.21	2.21	-258.68	-37.77	
12,096.00	59.78	351.66	11,827.04	356.85 S	968.34 W	504,157.55	725,552.96	2.21	-256.96	-37.75	
12,098.00	59.81	351.63	11,828.05	355.14 S	968.59 W	504,159.26	725,552.71	2.21	-255.23	-37.73	
12,100.00	59.85	351.60	11,829.05	353.43 S	968.84 W	504,160.97	725,552.46	2.21	-253.50	-37.72	
12,102.00	59.88	351.56	11,830.06	351.72 S	969.10 W	504,162.68	725,552.20	2.21	-251.77	-37.70	
12,104.00	59.92	351.53	11,831.06	350.00 S	969.35 W	504,164.40	725,551.95	2.21	-250.05	-37.69	
12,106.00	59.95	351.50	11,832.06	348.29 S	969.61 W	504,166.11	725,551.69	2.21	-248.32	-37.67	
12,108.00	59.99	351.47	11,833.06	346.58 S	969.86 W	504,167.82	725,551.44	2.21	-246.59	-37.66	
12,110.00	60.02	351.44	11,834.06	344.87 S	970.12 W	504,169.53	725,551.18	2.21	-244.86	-37.64	
12,112.00	60.06	351.41	11,835.06	343.15 S	970.38 W	504,171.25	725,550.92	2.21	-243.13	-37.62	
12,114.00	60.09	351.38	11,836.06	341.44 S	970.64 W	504,172.96	725,550.66	2.21	-241.39	-37.61	
12,116.00	60.13	351.35	11,837.06	339.73 S	970.90 W	504,174.67	725,550.40	2.21	-239.66	-37.59	
12,118.00	60.16	351.32	11,838.05	338.01 S	971.16 W	504,176.39	725,550.14	2.21	-237.93	-37.58	
12,120.00	60.20	351.28	11,839.05	336.30 S	971.42 W	504,178.10	725,549.88	2.21	-236.20	-37.56	
12,122.00	60.23	351.25	11,840.04	334.58 S	971.69 W	504,179.82	725,549.61	2.21	-234.46	-37.55	
12,124.00	60.27	351.22	11,841.03	332.86 S	971.95 W	504,181.54	725,549.35	2.21	-232.73	-37.53	
12,126.00	60.30	351.19	11,842.02	331.15 S	972.22 W	504,183.25	725,549.08	2.21	-230.99	-37.52	
12,128.00	60.34	351.16	11,843.01	329.43 S	972.48 W	504,184.97	725,548.82	2.21	-229.26	-37.50	
12,130.00	60.37	351.13	11,844.00	327.71 S	972.75 W	504,186.69	725,548.55	2.21	-227.52	-37.49	
12,132.00	60.41	351.10	11,844.99	326.00 S	973.02 W	504,188.40	725,548.28	2.21	-225.79	-37.47	
12,134.00	60.44	351.07	11,845.98	324.28 S	973.29 W	504,190.12	725,548.01	2.21	-224.05	-37.45	
12,136.00	60.48	351.04	11,846.96	322.56 S	973.56 W	504,191.84	725,547.74	2.21	-222.31	-37.44	
12,138.00	60.51	351.01	11,847.95	320.84 S	973.83 W	504,193.56	725,547.47	2.21	-220.58	-37.42	
12,140.00	60.56	350.99	11,848.93	319.12 S	974.10 W	504,195.28	725,547.20	2.48	-218.84	-16.65	
12,142.00	60.62	350.99	11,849.91	317.40 S	974.38 W	504,197.00	725,546.92	3.00	-217.10	-1.52	
12,144.00	60.68	350.99	11,850.90	315.68 S	974.65 W	504,198.72	725,546.65	3.00	-215.36	-1.51	
12,146.00	60.74	350.98	11,851.87	313.95 S	974.92 W	504,200.45	725,546.38	3.00	-213.62	-1.51	
12,148.00	60.80	350.98	11,852.85	312.23 S	975.20 W	504,202.17	725,546.10	3.00	-211.87	-1.51	
12,150.00	60.86	350.98	11,853.82	310.51 S	975.47 W	504,203.89	725,545.83	3.00	-210.13	-1.51	
12,152.00	61.31	351.21	11,854.79	308.78 S	975.74 W	504,205.62	725,545.56	24.83	-208.38	24.37	
12,154.00	61.77	351.45	11,855.75	307.04 S	976.01 W	504,207.36	725,545.29	24.83	-206.62	24.25	
12,156.00	62.22	351.67	11,856.68	305.29 S	976.27 W	504,209.11	725,545.03	24.83	-204.86	24.14	
12,158.00	62.67	351.90	11,857.61	303.54 S	976.52 W	504,210.86	725,544.78	24.83	-203.09	24.03	
12,160.00	63.13	352.13	11,858.52	301.77 S	976.77 W	504,212.63	725,544.53	24.83	-201.31	23.93	
12,162.00	63.58	352.35	11,859.42	300.00 S	977.01 W	504,214.40	725,544.29	24.83	-199.52	23.83	



Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
12,164.00	64.04	352.57	11,860.30	298.22 S	977.24 W	504,216.18	725,544.06	24.83	-197.73	23.73	
12,166.00	64.49	352.79	11,861.17	296.44 S	977.47 W	504,217.96	725,543.83	24.83	-195.93	23.63	
12,168.00	64.95	353.01	11,862.02	294.64 S	977.70 W	504,219.76	725,543.60	24.83	-194.12	23.53	
12,170.00	65.40	353.23	11,862.86	292.84 S	977.91 W	504,221.56	725,543.39	24.83	-192.31	23.44	
12,172.00	65.86	353.45	11,863.69	291.03 S	978.12 W	504,223.37	725,543.18	24.83	-190.48	23.35	
12,174.00	66.31	353.66	11,864.50	289.21 S	978.33 W	504,225.19	725,542.97	24.83	-188.66	23.26	
12,176.00	66.77	353.87	11,865.29	287.39 S	978.53 W	504,227.01	725,542.77	24.83	-186.82	23.17	
12,178.00	67.23	354.08	11,866.08	285.56 S	978.72 W	504,228.84	725,542.58	24.83	-184.98	23.09	
12,180.00	67.69	354.29	11,866.84	283.72 S	978.91 W	504,230.68	725,542.39	24.83	-183.13	23.00	
12,182.00	68.14	354.50	11,867.59	281.88 S	979.09 W	504,232.52	725,542.21	24.83	-181.28	22.92	
12,184.00	68.60	354.71	11,868.33	280.02 S	979.26 W	504,234.38	725,542.04	24.83	-179.42	22.85	
12,186.00	69.06	354.92	11,869.05	278.17 S	979.43 W	504,236.23	725,541.87	24.83	-177.56	22.77	
12,188.00	69.52	355.12	11,869.76	276.30 S	979.60 W	504,238.10	725,541.70	24.83	-175.69	22.69	
12,190.00	69.97	355.32	11,870.45	274.43 S	979.75 W	504,239.97	725,541.55	24.83	-173.81	22.62	
12,192.00	70.43	355.53	11,871.13	272.56 S	979.90 W	504,241.84	725,541.40	24.83	-171.93	22.55	
12,194.00	70.89	355.73	11,871.79	270.68 S	980.05 W	504,243.72	725,541.25	24.83	-170.04	22.48	
12,196.00	71.35	355.93	11,872.44	268.79 S	980.18 W	504,245.61	725,541.12	24.83	-168.15	22.42	
12,198.00	71.81	356.12	11,873.07	266.90 S	980.32 W	504,247.50	725,540.98	24.83	-166.25	22.35	
12,200.00	72.27	356.32	11,873.69	265.00 S	980.44 W	504,249.40	725,540.86	24.83	-164.35	22.29	
12,202.00	72.73	356.52	11,874.29	263.09 S	980.56 W	504,251.31	725,540.74	24.83	-162.45	22.23	
12,204.00	73.19	356.71	11,874.88	261.19 S	980.67 W	504,253.21	725,540.63	24.83	-160.54	22.17	
12,206.00	73.65	356.91	11,875.45	259.27 S	980.78 W	504,255.13	725,540.52	24.83	-158.62	22.11	
12,208.00	74.11	357.10	11,876.00	257.35 S	980.88 W	504,257.05	725,540.42	24.83	-156.70	22.06	
12,210.00	74.57	357.30	11,876.54	255.43 S	980.97 W	504,258.97	725,540.33	24.83	-154.78	22.00	
12,212.00	75.03	357.49	11,877.07	253.50 S	981.06 W	504,260.90	725,540.24	24.83	-152.85	21.95	
12,214.00	75.49	357.68	11,877.58	251.57 S	981.14 W	504,262.83	725,540.16	24.83	-150.92	21.90	
12,216.00	75.95	357.87	11,878.07	249.63 S	981.22 W	504,264.77	725,540.08	24.83	-148.99	21.85	
12,218.00	76.41	358.06	11,878.55	247.69 S	981.29 W	504,266.71	725,540.01	24.83	-147.05	21.80	
12,220.00	76.88	358.25	11,879.01	245.75 S	981.35 W	504,268.65	725,539.95	24.83	-145.11	21.76	
12,222.00	77.34	358.44	11,879.45	243.80 S	981.41 W	504,270.60	725,539.89	24.83	-143.16	21.72	
12,224.00	77.80	358.63	11,879.89	241.84 S	981.46 W	504,272.56	725,539.84	24.83	-141.22	21.67	
12,226.00	78.26	358.81	11,880.30	239.89 S	981.50 W	504,274.51	725,539.80	24.83	-139.26	21.63	
12,228.00	78.72	359.00	11,880.70	237.93 S	981.54 W	504,276.47	725,539.76	24.83	-137.31	21.59	
12,230.00	79.18	359.18	11,881.08	235.97 S	981.57 W	504,278.43	725,539.73	24.83	-135.36	21.56	
12,232.00	79.65	359.37	11,881.45	234.00 S	981.59 W	504,280.40	725,539.71	24.83	-133.40	21.52	
12,234.00	80.11	359.55	11,881.80	232.03 S	981.61 W	504,282.37	725,539.69	24.83	-131.44	21.49	
12,236.00	80.57	359.74	11,882.14	230.06 S	981.62 W	504,284.34	725,539.68	24.83	-129.47	21.46	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
12,238.00	81.03	359.92	11,882.46	228.09 S	981.63 W	504,286.31	725,539.67	24.83	-127.51	21.42	
12,240.00	81.49	0.10	11,882.76	226.11 S	981.63 W	504,288.29	725,539.67	24.83	-125.54	21.40	
12,242.00	81.96	0.29	11,883.05	224.13 S	981.62 W	504,290.27	725,539.68	24.83	-123.57	21.37	
12,244.00	82.42	0.47	11,883.32	222.15 S	981.61 W	504,292.25	725,539.69	24.83	-121.60	21.34	
12,246.00	82.53	0.50	11,883.58	220.17 S	981.59 W	504,294.23	725,539.71	5.47	-119.63	15.17	
12,248.00	82.63	0.53	11,883.84	218.18 S	981.57 W	504,296.22	725,539.73	5.47	-117.66	15.16	
12,250.00	82.74	0.56	11,884.10	216.20 S	981.56 W	504,298.20	725,539.74	5.47	-115.69	15.16	
12,252.00	82.84	0.59	11,884.35	214.22 S	981.54 W	504,300.18	725,539.76	5.47	-113.72	15.16	
12,254.00	82.95	0.61	11,884.59	212.23 S	981.52 W	504,302.17	725,539.78	5.47	-111.75	15.15	
12,256.00	83.05	0.64	11,884.84	210.25 S	981.49 W	504,304.15	725,539.81	5.47	-109.77	15.15	
12,258.00	83.16	0.67	11,885.08	208.26 S	981.47 W	504,306.14	725,539.83	5.47	-107.80	15.15	
12,260.00	83.27	0.70	11,885.31	206.27 S	981.45 W	504,308.13	725,539.85	5.47	-105.83	15.14	
12,262.00	83.37	0.73	11,885.55	204.29 S	981.42 W	504,310.11	725,539.88	5.47	-103.86	15.14	
12,264.00	83.48	0.76	11,885.78	202.30 S	981.40 W	504,312.10	725,539.90	5.47	-101.88	15.14	
12,266.00	83.58	0.79	11,886.00	200.31 S	981.37 W	504,314.09	725,539.93	5.47	-99.91	15.13	
12,268.00	83.69	0.82	11,886.22	198.33 S	981.34 W	504,316.07	725,539.96	5.47	-97.93	15.13	
12,270.00	83.79	0.84	11,886.44	196.34 S	981.31 W	504,318.06	725,539.99	5.47	-95.96	15.13	
12,272.00	83.90	0.87	11,886.65	194.35 S	981.28 W	504,320.05	725,540.02	5.47	-93.98	15.12	
12,274.00	84.00	0.90	11,886.87	192.36 S	981.25 W	504,322.04	725,540.05	5.47	-92.01	15.12	
12,276.00	84.11	0.93	11,887.07	190.37 S	981.22 W	504,324.03	725,540.08	5.47	-90.03	15.12	
12,278.00	84.22	0.96	11,887.28	188.38 S	981.19 W	504,326.02	725,540.11	5.47	-88.06	15.11	
12,280.00	84.32	0.99	11,887.48	186.39 S	981.15 W	504,328.01	725,540.15	5.47	-86.08	15.11	
12,282.00	84.43	1.02	11,887.67	184.40 S	981.12 W	504,330.00	725,540.18	5.47	-84.10	15.11	
12,284.00	84.53	1.05	11,887.86	182.41 S	981.08 W	504,331.99	725,540.22	5.47	-82.13	15.10	
12,286.00	84.64	1.07	11,888.05	180.42 S	981.05 W	504,333.98	725,540.25	5.47	-80.15	15.10	
12,288.00	84.74	1.10	11,888.24	178.43 S	981.01 W	504,335.97	725,540.29	5.47	-78.17	15.10	
12,290.00	84.85	1.13	11,888.42	176.44 S	980.97 W	504,337.96	725,540.33	5.47	-76.20	15.10	
12,292.00	84.96	1.16	11,888.60	174.45 S	980.93 W	504,339.95	725,540.37	5.47	-74.22	15.09	
12,294.00	85.06	1.19	11,888.77	172.46 S	980.89 W	504,341.94	725,540.41	5.47	-72.24	15.09	
12,296.00	85.17	1.22	11,888.94	170.46 S	980.85 W	504,343.94	725,540.45	5.47	-70.26	15.09	
12,298.00	85.27	1.25	11,889.11	168.47 S	980.80 W	504,345.93	725,540.50	5.47	-68.29	15.09	
12,300.00	85.38	1.27	11,889.27	166.48 S	980.76 W	504,347.92	725,540.54	5.47	-66.31	15.08	
12,302.00	85.48	1.30	11,889.43	164.49 S	980.72 W	504,349.91	725,540.58	5.47	-64.33	15.08	
12,304.00	85.59	1.33	11,889.59	162.49 S	980.67 W	504,351.91	725,540.63	5.47	-62.35	15.08	
12,306.00	85.70	1.36	11,889.74	160.50 S	980.62 W	504,353.90	725,540.68	5.47	-60.37	15.08	
12,308.00	85.80	1.39	11,889.89	158.50 S	980.58 W	504,355.90	725,540.72	5.47	-58.39	15.08	
12,310.00	85.91	1.42	11,890.03	156.51 S	980.53 W	504,357.89	725,540.77	5.47	-56.41	15.07	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
12,312.00	86.01	1.45	11,890.17	154.52 S	980.48 W	504,359.88	725,540.82	5.47	-54.43	15.07	
12,314.00	86.12	1.47	11,890.31	152.52 S	980.43 W	504,361.88	725,540.87	5.47	-52.46	15.07	
12,316.00	86.22	1.50	11,890.44	150.53 S	980.37 W	504,363.87	725,540.93	5.47	-50.48	15.07	
12,318.00	86.33	1.53	11,890.57	148.53 S	980.32 W	504,365.87	725,540.98	5.47	-48.50	15.07	
12,320.00	86.44	1.56	11,890.70	146.54 S	980.27 W	504,367.86	725,541.03	5.47	-46.52	15.06	
12,322.00	86.54	1.59	11,890.82	144.54 S	980.21 W	504,369.86	725,541.09	5.47	-44.54	15.06	
12,324.00	86.65	1.62	11,890.94	142.55 S	980.16 W	504,371.85	725,541.14	5.47	-42.56	15.06	
12,326.00	86.75	1.64	11,891.05	140.55 S	980.10 W	504,373.85	725,541.20	5.47	-40.58	15.06	
12,328.00	86.86	1.67	11,891.17	138.55 S	980.04 W	504,375.85	725,541.26	5.47	-38.60	15.06	
12,330.00	86.96	1.70	11,891.27	136.56 S	979.98 W	504,377.84	725,541.32	5.47	-36.62	15.05	
12,332.00	87.07	1.73	11,891.38	134.56 S	979.92 W	504,379.84	725,541.38	5.47	-34.64	15.05	
12,334.00	87.18	1.76	11,891.48	132.56 S	979.86 W	504,381.84	725,541.44	5.47	-32.66	15.05	
12,336.00	87.28	1.79	11,891.58	130.57 S	979.80 W	504,383.83	725,541.50	5.47	-30.68	15.05	
12,338.00	87.39	1.82	11,891.67	128.57 S	979.74 W	504,385.83	725,541.56	5.47	-28.70	15.05	
12,340.00	87.45	1.82	11,891.76	126.57 S	979.67 W	504,387.83	725,541.63	3.26	-26.72	3.29	
12,342.00	87.48	1.80	11,891.85	124.58 S	979.61 W	504,389.82	725,541.69	1.62	-24.74	-40.33	
12,344.00	87.50	1.78	11,891.93	122.58 S	979.55 W	504,391.82	725,541.75	1.62	-22.76	-40.33	
12,346.00	87.53	1.76	11,892.02	120.58 S	979.49 W	504,393.82	725,541.81	1.62	-20.78	-40.33	
12,348.00	87.55	1.74	11,892.11	118.59 S	979.43 W	504,395.81	725,541.87	1.62	-18.79	-40.33	
12,350.00	87.58	1.71	11,892.19	116.59 S	979.37 W	504,397.81	725,541.93	1.62	-16.81	-40.33	
12,352.00	87.60	1.69	11,892.28	114.59 S	979.31 W	504,399.81	725,541.99	1.62	-14.83	-40.33	
12,354.00	87.62	1.67	11,892.36	112.59 S	979.25 W	504,401.81	725,542.05	1.62	-12.85	-40.33	
12,356.00	87.65	1.65	11,892.44	110.60 S	979.19 W	504,403.80	725,542.11	1.62	-10.87	-40.33	
12,358.00	87.67	1.63	11,892.52	108.60 S	979.13 W	504,405.80	725,542.17	1.62	-8.89	-40.32	
12,360.00	87.70	1.61	11,892.60	106.60 S	979.08 W	504,407.80	725,542.22	1.62	-6.91	-40.32	
12,362.00	87.72	1.59	11,892.68	104.60 S	979.02 W	504,409.80	725,542.28	1.62	-4.93	-40.32	
12,364.00	87.75	1.57	11,892.76	102.61 S	978.97 W	504,411.79	725,542.33	1.62	-2.94	-40.32	
12,366.00	87.77	1.55	11,892.84	100.61 S	978.91 W	504,413.79	725,542.39	1.62	-0.96	-40.32	
12,368.00	87.80	1.53	11,892.92	98.61 S	978.86 W	504,415.79	725,542.44	1.62	1.02	-40.32	
12,370.00	87.82	1.51	11,892.99	96.61 S	978.81 W	504,417.79	725,542.49	1.62	3.00	-40.32	
12,372.00	87.85	1.48	11,893.07	94.61 S	978.75 W	504,419.79	725,542.55	1.62	4.99	-40.32	
12,374.00	87.87	1.46	11,893.14	92.62 S	978.70 W	504,421.78	725,542.60	1.62	6.97	-40.32	
12,376.00	87.90	1.44	11,893.22	90.62 S	978.65 W	504,423.78	725,542.65	1.62	8.95	-40.32	
12,378.00	87.92	1.42	11,893.29	88.62 S	978.60 W	504,425.78	725,542.70	1.62	10.93	-40.32	
12,380.00	87.95	1.40	11,893.36	86.62 S	978.55 W	504,427.78	725,542.75	1.62	12.92	-40.32	
12,382.00	87.97	1.38	11,893.44	84.62 S	978.50 W	504,429.78	725,542.80	1.62	14.90	-40.32	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
12,384.00	87.99	1.36	11,893.51	82.63 S	978.46 W	504,431.77	725,542.84	1.62	16.88	-40.31	
12,386.00	88.02	1.34	11,893.58	80.63 S	978.41 W	504,433.77	725,542.89	1.62	18.86	-40.31	
12,388.00	88.04	1.32	11,893.64	78.63 S	978.36 W	504,435.77	725,542.94	1.62	20.85	-40.31	
12,390.00	88.07	1.30	11,893.71	76.63 S	978.32 W	504,437.77	725,542.98	1.62	22.83	-40.31	
12,392.00	88.09	1.28	11,893.78	74.63 S	978.27 W	504,439.77	725,543.03	1.62	24.82	-40.31	
12,394.00	88.12	1.25	11,893.84	72.63 S	978.23 W	504,441.77	725,543.07	1.62	26.80	-40.31	
12,396.00	88.14	1.23	11,893.91	70.64 S	978.18 W	504,443.76	725,543.12	1.62	28.78	-40.31	
12,398.00	88.17	1.21	11,893.97	68.64 S	978.14 W	504,445.76	725,543.16	1.62	30.77	-40.31	
12,400.00	88.19	1.19	11,894.04	66.64 S	978.10 W	504,447.76	725,543.20	1.62	32.75	-40.31	
12,402.00	88.22	1.17	11,894.10	64.64 S	978.06 W	504,449.76	725,543.24	1.62	34.73	-40.31	
12,404.00	88.24	1.15	11,894.16	62.64 S	978.02 W	504,451.76	725,543.28	1.62	36.72	-40.31	
12,406.00	88.27	1.13	11,894.22	60.64 S	977.98 W	504,453.76	725,543.32	1.62	38.70	-40.31	
12,408.00	88.29	1.11	11,894.28	58.64 S	977.94 W	504,455.76	725,543.36	1.62	40.69	-40.31	
12,410.00	88.32	1.09	11,894.34	56.65 S	977.90 W	504,457.75	725,543.40	1.62	42.67	-40.31	
12,412.00	88.34	1.07	11,894.40	54.65 S	977.86 W	504,459.75	725,543.44	1.62	44.66	-40.30	
12,414.00	88.36	1.05	11,894.46	52.65 S	977.83 W	504,461.75	725,543.47	1.62	46.64	-40.30	
12,416.00	88.39	1.02	11,894.52	50.65 S	977.79 W	504,463.75	725,543.51	1.62	48.63	-40.30	
12,418.00	88.41	1.00	11,894.57	48.65 S	977.76 W	504,465.75	725,543.54	1.62	50.61	-40.30	
12,420.00	88.44	0.98	11,894.63	46.65 S	977.72 W	504,467.75	725,543.58	1.62	52.60	-40.30	
12,422.00	88.46	0.96	11,894.68	44.65 S	977.69 W	504,469.75	725,543.61	1.62	54.58	-40.30	
12,424.00	88.49	0.94	11,894.73	42.65 S	977.65 W	504,471.75	725,543.65	1.62	56.57	-40.30	
12,426.00	88.54	0.91	11,894.79	40.65 S	977.62 W	504,473.75	725,543.68	3.07	58.55	-34.04	
12,428.00	88.62	0.86	11,894.84	38.65 S	977.59 W	504,475.75	725,543.71	4.53	60.54	-31.81	
12,430.00	88.69	0.81	11,894.88	36.66 S	977.56 W	504,477.74	725,543.74	4.53	62.53	-31.81	
12,432.00	88.77	0.76	11,894.93	34.66 S	977.53 W	504,479.74	725,543.77	4.53	64.51	-31.81	
12,434.00	88.85	0.71	11,894.97	32.66 S	977.51 W	504,481.74	725,543.79	4.53	66.50	-31.80	
12,436.00	88.92	0.67	11,895.01	30.66 S	977.48 W	504,483.74	725,543.82	4.53	68.48	-31.80	
12,438.00	89.00	0.62	11,895.04	28.66 S	977.46 W	504,485.74	725,543.84	4.53	70.47	-31.80	
12,440.00	89.08	0.57	11,895.08	26.66 S	977.44 W	504,487.74	725,543.86	4.53	72.46	-31.80	
12,442.00	89.15	0.52	11,895.11	24.66 S	977.42 W	504,489.74	725,543.88	4.53	74.45	-31.80	
12,444.00	89.23	0.48	11,895.14	22.66 S	977.40 W	504,491.74	725,543.90	4.53	76.43	-31.80	
12,446.00	89.31	0.43	11,895.16	20.66 S	977.39 W	504,493.74	725,543.91	4.53	78.42	-31.80	
12,448.00	89.39	0.38	11,895.18	18.66 S	977.37 W	504,495.74	725,543.93	4.53	80.41	-31.80	
12,450.00	89.46	0.33	11,895.20	16.66 S	977.36 W	504,497.74	725,543.94	4.53	82.40	-31.80	
12,452.00	89.54	0.28	11,895.22	14.66 S	977.35 W	504,499.74	725,543.95	4.53	84.39	-31.80	
12,454.00	89.62	0.24	11,895.24	12.66 S	977.34 W	504,501.74	725,543.96	4.53	86.38	-31.80	
12,456.00	89.69	0.19	11,895.25	10.66 S	977.33 W	504,503.74	725,543.97	4.53	88.36	-31.80	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
12,458.00	89.77	0.14	11,895.26	8.66 S	977.33 W	504,505.74	725,543.97	4.53	90.35	-31.80	
12,460.00	89.85	0.09	11,895.26	6.66 S	977.32 W	504,507.74	725,543.98	4.53	92.34	-31.80	
12,462.00	89.93	0.05	11,895.27	4.66 S	977.32 W	504,509.74	725,543.98	4.53	94.33	-31.80	
12,464.00	90.00	360.00	11,895.27	2.66 S	977.32 W	504,511.74	725,543.98	4.53	96.32	-31.80	
12,466.00	90.08	359.95	11,895.27	0.66 S	977.32 W	504,513.74	725,543.98	4.53	98.31	-31.80	
12,468.00	90.16	359.90	11,895.26	1.34 N	977.32 W	504,515.74	725,543.98	4.53	100.30	-31.80	
12,470.00	90.23	359.85	11,895.26	3.34 N	977.33 W	504,517.74	725,543.97	4.53	102.29	-31.80	
12,472.00	90.31	359.81	11,895.25	5.34 N	977.33 W	504,519.74	725,543.97	4.53	104.28	-31.80	
12,474.00	90.39	359.76	11,895.24	7.34 N	977.34 W	504,521.74	725,543.96	4.53	106.27	-31.80	
12,476.00	90.46	359.71	11,895.22	9.34 N	977.35 W	504,523.74	725,543.95	4.53	108.26	-31.80	
12,478.00	90.54	359.66	11,895.20	11.34 N	977.36 W	504,525.74	725,543.94	4.53	110.25	-31.80	
12,480.00	90.62	359.62	11,895.18	13.34 N	977.38 W	504,527.74	725,543.92	4.53	112.24	-31.80	
12,482.00	90.70	359.57	11,895.16	15.34 N	977.39 W	504,529.74	725,543.91	4.53	114.24	-31.80	
12,484.00	90.77	359.52	11,895.13	17.34 N	977.41 W	504,531.74	725,543.89	4.53	116.23	-31.80	
12,486.00	90.85	359.47	11,895.11	19.34 N	977.42 W	504,533.74	725,543.88	4.53	118.22	-31.80	
12,488.00	90.93	359.42	11,895.07	21.34 N	977.44 W	504,535.74	725,543.86	4.53	120.21	-31.80	
12,490.00	91.00	359.38	11,895.04	23.34 N	977.46 W	504,537.74	725,543.84	4.53	122.20	-31.80	
12,492.00	91.08	359.33	11,895.00	25.34 N	977.49 W	504,539.74	725,543.81	4.53	124.19	-31.80	
12,494.00	91.16	359.28	11,894.97	27.34 N	977.51 W	504,541.74	725,543.79	4.53	126.18	-31.80	
12,496.00	91.24	359.23	11,894.92	29.34 N	977.54 W	504,543.74	725,543.76	4.53	128.18	-31.80	
12,498.00	91.31	359.19	11,894.88	31.34 N	977.56 W	504,545.74	725,543.74	4.53	130.17	-31.80	
12,500.00	91.39	359.14	11,894.83	33.34 N	977.59 W	504,547.74	725,543.71	4.53	132.16	-31.81	
12,502.00	91.47	359.09	11,894.78	35.33 N	977.62 W	504,549.73	725,543.68	4.53	134.15	-31.81	
12,504.00	91.54	359.04	11,894.73	37.33 N	977.66 W	504,551.73	725,543.64	4.53	136.14	-31.81	
12,506.00	91.62	358.99	11,894.67	39.33 N	977.69 W	504,553.73	725,543.61	4.53	138.14	-31.81	
12,508.00	91.70	358.95	11,894.62	41.33 N	977.73 W	504,555.73	725,543.57	4.53	140.13	-31.81	
12,510.00	91.77	358.90	11,894.56	43.33 N	977.76 W	504,557.73	725,543.54	4.53	142.12	-31.81	
12,512.00	91.85	358.85	11,894.49	45.33 N	977.80 W	504,559.73	725,543.50	4.53	144.11	-31.81	
12,514.00	91.93	358.80	11,894.43	47.33 N	977.84 W	504,561.73	725,543.46	4.53	146.10	-31.82	
12,516.00	92.01	358.76	11,894.36	49.33 N	977.89 W	504,563.73	725,543.41	4.53	148.10	-31.82	
12,518.00	92.08	358.71	11,894.29	51.32 N	977.93 W	504,565.72	725,543.37	4.53	150.09	-31.82	
12,520.00	92.16	358.66	11,894.21	53.32 N	977.98 W	504,567.72	725,543.32	4.53	152.08	-31.82	
12,522.00	92.12	358.64	11,894.14	55.32 N	978.02 W	504,569.72	725,543.28	2.25	154.07	-156.94	
12,524.00	92.08	358.62	11,894.06	57.32 N	978.07 W	504,571.72	725,543.23	2.25	156.07	-156.94	
12,526.00	92.04	358.61	11,893.99	59.32 N	978.12 W	504,573.72	725,543.18	2.25	158.06	-156.94	
12,528.00	91.99	358.59	11,893.92	61.31 N	978.17 W	504,575.71	725,543.13	2.25	160.05	-156.94	
12,530.00	91.95	358.57	11,893.85	63.31 N	978.22 W	504,577.71	725,543.08	2.25	162.05	-156.94	



Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
12,532.00	91.91	358.55	11,893.79	65.31 N	978.27 W	504,579.71	725,543.03	2.25	164.04	-156.94	
12,534.00	91.87	358.54	11,893.72	67.31 N	978.32 W	504,581.71	725,542.98	2.25	166.03	-156.94	
12,536.00	91.83	358.52	11,893.66	69.31 N	978.37 W	504,583.71	725,542.93	2.25	168.03	-156.94	
12,538.00	91.79	358.50	11,893.59	71.31 N	978.42 W	504,585.71	725,542.88	2.25	170.02	-156.94	
12,540.00	91.75	358.48	11,893.53	73.30 N	978.47 W	504,587.70	725,542.83	2.25	172.01	-156.94	
12,542.00	91.70	358.47	11,893.47	75.30 N	978.53 W	504,589.70	725,542.77	2.25	174.01	-156.94	
12,544.00	91.66	358.45	11,893.41	77.30 N	978.58 W	504,591.70	725,542.72	2.25	176.00	-156.94	
12,546.00	91.62	358.43	11,893.35	79.30 N	978.64 W	504,593.70	725,542.66	2.25	177.99	-156.94	
12,548.00	91.58	358.41	11,893.30	81.30 N	978.69 W	504,595.70	725,542.61	2.25	179.99	-156.95	
12,550.00	91.54	358.39	11,893.24	83.30 N	978.75 W	504,597.70	725,542.55	2.25	181.98	-156.95	
12,552.00	91.50	358.38	11,893.19	85.30 N	978.80 W	504,599.70	725,542.50	2.25	183.97	-156.95	
12,554.00	91.45	358.36	11,893.14	87.29 N	978.86 W	504,601.69	725,542.44	2.25	185.97	-156.95	
12,556.00	91.41	358.34	11,893.09	89.29 N	978.92 W	504,603.69	725,542.38	2.25	187.96	-156.95	
12,558.00	91.37	358.32	11,893.04	91.29 N	978.98 W	504,605.69	725,542.32	2.25	189.96	-156.95	
12,560.00	91.33	358.31	11,892.99	93.29 N	979.03 W	504,607.69	725,542.27	2.25	191.95	-156.95	
12,562.00	91.29	358.29	11,892.95	95.29 N	979.09 W	504,609.69	725,542.21	2.25	193.95	-156.95	
12,564.00	91.25	358.27	11,892.90	97.29 N	979.15 W	504,611.69	725,542.15	2.25	195.94	-156.95	
12,566.00	91.21	358.25	11,892.86	99.29 N	979.21 W	504,613.69	725,542.09	2.25	197.93	-156.95	
12,568.00	91.16	358.24	11,892.82	101.28 N	979.28 W	504,615.68	725,542.02	2.25	199.93	-156.95	
12,570.00	91.12	358.22	11,892.78	103.28 N	979.34 W	504,617.68	725,541.96	2.25	201.92	-156.95	
12,572.00	91.08	358.20	11,892.74	105.28 N	979.40 W	504,619.68	725,541.90	2.25	203.92	-156.95	
12,574.00	91.04	358.18	11,892.70	107.28 N	979.46 W	504,621.68	725,541.84	2.25	205.91	-156.95	
12,576.00	91.00	358.17	11,892.67	109.28 N	979.53 W	504,623.68	725,541.77	2.25	207.91	-156.95	
12,578.00	90.96	358.15	11,892.64	111.28 N	979.59 W	504,625.68	725,541.71	2.25	209.90	-156.95	
12,580.00	90.92	358.13	11,892.60	113.28 N	979.66 W	504,627.68	725,541.64	2.25	211.90	-156.95	
12,582.00	90.87	358.11	11,892.57	115.27 N	979.72 W	504,629.67	725,541.58	2.25	213.89	-156.95	
12,584.00	90.83	358.09	11,892.54	117.27 N	979.79 W	504,631.67	725,541.51	2.25	215.89	-156.95	
12,586.00	90.79	358.08	11,892.51	119.27 N	979.85 W	504,633.67	725,541.45	2.25	217.88	-156.95	
12,588.00	90.75	358.06	11,892.49	121.27 N	979.92 W	504,635.67	725,541.38	2.25	219.88	-156.95	
12,590.00	90.71	358.04	11,892.46	123.27 N	979.99 W	504,637.67	725,541.31	2.25	221.87	-156.95	
12,592.00	90.67	358.02	11,892.44	125.27 N	980.06 W	504,639.67	725,541.24	2.25	223.87	-156.95	
12,594.00	90.62	358.01	11,892.41	127.27 N	980.13 W	504,641.67	725,541.17	2.25	225.86	-156.95	
12,596.00	90.58	357.99	11,892.39	129.27 N	980.20 W	504,643.67	725,541.10	2.25	227.86	-156.95	
12,598.00	90.54	357.97	11,892.37	131.26 N	980.27 W	504,645.66	725,541.03	2.25	229.86	-156.95	
12,600.00	90.50	357.95	11,892.36	133.26 N	980.34 W	504,647.66	725,540.96	2.25	231.85	-156.95	
12,602.00	90.46	357.94	11,892.34	135.26 N	980.41 W	504,649.66	725,540.89	2.25	233.85	-156.95	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
12,604.00	90.42	357.92	11,892.32	137.26 N	980.48 W	504,651.66	725,540.82	2.25	235.84	-156.95	
12,606.00	90.38	357.90	11,892.31	139.26 N	980.56 W	504,653.66	725,540.74	2.25	237.84	-156.95	
12,608.00	90.33	357.88	11,892.30	141.26 N	980.63 W	504,655.66	725,540.67	2.25	239.83	-156.95	
12,610.00	90.29	357.87	11,892.29	143.26 N	980.70 W	504,657.66	725,540.60	2.25	241.83	-156.95	
12,612.00	90.25	357.85	11,892.28	145.25 N	980.78 W	504,659.65	725,540.52	2.25	243.83	-156.95	
12,614.00	90.21	357.83	11,892.27	147.25 N	980.85 W	504,661.65	725,540.45	2.25	245.82	-156.95	
12,616.00	90.22	357.80	11,892.26	149.25 N	980.93 W	504,663.65	725,540.37	1.77	247.82	-71.99	
12,618.00	90.23	357.76	11,892.25	151.25 N	981.01 W	504,665.65	725,540.29	1.77	249.81	-71.99	
12,620.00	90.24	357.73	11,892.24	153.25 N	981.09 W	504,667.65	725,540.21	1.77	251.81	-71.99	
12,622.00	90.25	357.70	11,892.24	155.25 N	981.17 W	504,669.65	725,540.13	1.77	253.81	-71.99	
12,624.00	90.26	357.66	11,892.23	157.24 N	981.25 W	504,671.64	725,540.05	1.77	255.80	-71.99	
12,626.00	90.28	357.63	11,892.22	159.24 N	981.33 W	504,673.64	725,539.97	1.77	257.80	-71.99	
12,628.00	90.29	357.59	11,892.21	161.24 N	981.41 W	504,675.64	725,539.89	1.77	259.79	-71.99	
12,630.00	90.30	357.56	11,892.20	163.24 N	981.50 W	504,677.64	725,539.80	1.77	261.79	-71.99	
12,632.00	90.31	357.53	11,892.19	165.24 N	981.58 W	504,679.64	725,539.72	1.77	263.79	-71.99	
12,634.00	90.32	357.49	11,892.18	167.24 N	981.67 W	504,681.64	725,539.63	1.77	265.78	-71.99	
12,636.00	90.33	357.46	11,892.16	169.23 N	981.76 W	504,683.63	725,539.54	1.77	267.78	-71.99	
12,638.00	90.34	357.43	11,892.15	171.23 N	981.85 W	504,685.63	725,539.45	1.77	269.78	-71.99	
12,640.00	90.35	357.39	11,892.14	173.23 N	981.94 W	504,687.63	725,539.36	1.77	271.77	-71.99	
12,642.00	90.36	357.36	11,892.13	175.23 N	982.03 W	504,689.63	725,539.27	1.77	273.77	-71.99	
12,644.00	90.37	357.32	11,892.12	177.23 N	982.12 W	504,691.63	725,539.18	1.77	275.77	-71.99	
12,646.00	90.39	357.29	11,892.10	179.22 N	982.22 W	504,693.62	725,539.08	1.77	277.77	-71.99	
12,648.00	90.40	357.26	11,892.09	181.22 N	982.31 W	504,695.62	725,538.99	1.77	279.76	-71.99	
12,650.00	90.41	357.22	11,892.07	183.22 N	982.41 W	504,697.62	725,538.89	1.77	281.76	-71.99	
12,652.00	90.42	357.19	11,892.06	185.22 N	982.51 W	504,699.62	725,538.79	1.77	283.76	-71.99	
12,654.00	90.43	357.16	11,892.05	187.21 N	982.60 W	504,701.61	725,538.70	1.77	285.75	-71.99	
12,656.00	90.44	357.12	11,892.03	189.21 N	982.70 W	504,703.61	725,538.60	1.77	287.75	-71.99	
12,658.00	90.45	357.09	11,892.01	191.21 N	982.81 W	504,705.61	725,538.49	1.77	289.75	-71.99	
12,660.00	90.46	357.06	11,892.00	193.21 N	982.91 W	504,707.61	725,538.39	1.77	291.75	-71.99	
12,662.00	90.47	357.02	11,891.98	195.20 N	983.01 W	504,709.60	725,538.29	1.77	293.74	-71.99	
12,664.00	90.48	356.99	11,891.97	197.20 N	983.12 W	504,711.60	725,538.18	1.77	295.74	-71.99	
12,666.00	90.49	356.95	11,891.95	199.20 N	983.22 W	504,713.60	725,538.08	1.77	297.74	-71.99	
12,668.00	90.51	356.92	11,891.93	201.19 N	983.33 W	504,715.59	725,537.97	1.77	299.74	-72.00	
12,670.00	90.52	356.89	11,891.91	203.19 N	983.44 W	504,717.59	725,537.86	1.77	301.73	-72.00	
12,672.00	90.53	356.85	11,891.90	205.19 N	983.54 W	504,719.59	725,537.76	1.77	303.73	-72.00	
12,674.00	90.54	356.82	11,891.88	207.19 N	983.66 W	504,721.59	725,537.64	1.77	305.73	-72.00	
12,676.00	90.55	356.79	11,891.86	209.18 N	983.77 W	504,723.58	725,537.53	1.77	307.73	-72.00	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates (usft)		Map Coordinates (usft)		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing	Easting	Northing	Easting				
12,678.00	90.56	356.75	11,891.84	211.18 N	983.88 W	504,725.58	725,537.42	1.77	309.72	-72.00	
12,680.00	90.57	356.72	11,891.82	213.18 N	983.99 W	504,727.58	725,537.31	1.77	311.72	-72.00	
12,682.00	90.58	356.68	11,891.80	215.17 N	984.11 W	504,729.57	725,537.19	1.77	313.72	-72.00	
12,684.00	90.59	356.65	11,891.78	217.17 N	984.22 W	504,731.57	725,537.08	1.77	315.72	-72.00	
12,686.00	90.60	356.62	11,891.76	219.16 N	984.34 W	504,733.56	725,536.96	1.77	317.72	-72.00	
12,688.00	90.62	356.58	11,891.74	221.16 N	984.46 W	504,735.56	725,536.84	1.77	319.72	-72.00	
12,690.00	90.63	356.55	11,891.71	223.16 N	984.58 W	504,737.56	725,536.72	1.77	321.71	-72.00	
12,692.00	90.64	356.52	11,891.69	225.15 N	984.70 W	504,739.55	725,536.60	1.77	323.71	-72.00	
12,694.00	90.65	356.48	11,891.67	227.15 N	984.82 W	504,741.55	725,536.48	1.77	325.71	-72.00	
12,696.00	90.66	356.45	11,891.65	229.15 N	984.95 W	504,743.55	725,536.35	1.77	327.71	-72.00	
12,698.00	90.67	356.42	11,891.62	231.14 N	985.07 W	504,745.54	725,536.23	1.77	329.71	-72.00	
12,700.00	90.68	356.38	11,891.60	233.14 N	985.20 W	504,747.54	725,536.10	1.77	331.70	-72.00	
12,702.00	90.69	356.35	11,891.58	235.13 N	985.32 W	504,749.53	725,535.98	1.77	333.70	-72.00	
12,704.00	90.70	356.31	11,891.55	237.13 N	985.45 W	504,751.53	725,535.85	1.77	335.70	-72.00	
12,706.00	90.71	356.28	11,891.53	239.13 N	985.58 W	504,753.53	725,535.72	1.77	337.70	-72.00	
12,708.00	90.72	356.25	11,891.50	241.12 N	985.71 W	504,755.52	725,535.59	1.77	339.70	-72.00	
12,710.00	90.72	356.24	11,891.48	243.12 N	985.84 W	504,757.52	725,535.46	0.28	341.70	-130.38	
12,712.00	90.70	356.27	11,891.45	245.11 N	985.97 W	504,759.51	725,535.33	1.55	343.70	125.62	
12,714.00	90.68	356.29	11,891.43	247.11 N	986.10 W	504,761.51	725,535.20	1.55	345.69	125.62	
12,716.00	90.67	356.32	11,891.40	249.10 N	986.23 W	504,763.50	725,535.07	1.55	347.69	125.62	
12,718.00	90.65	356.34	11,891.38	251.10 N	986.36 W	504,765.50	725,534.94	1.55	349.69	125.62	
12,720.00	90.63	356.37	11,891.36	253.09 N	986.49 W	504,767.49	725,534.81	1.55	351.69	125.63	
12,722.00	90.61	356.39	11,891.34	255.09 N	986.61 W	504,769.49	725,534.69	1.55	353.69	125.63	
12,724.00	90.59	356.42	11,891.32	257.09 N	986.74 W	504,771.49	725,534.56	1.55	355.69	125.63	
12,726.00	90.58	356.44	11,891.30	259.08 N	986.86 W	504,773.48	725,534.44	1.55	357.68	125.63	
12,728.00	90.56	356.47	11,891.28	261.08 N	986.99 W	504,775.48	725,534.31	1.55	359.68	125.63	
12,730.00	90.54	356.50	11,891.26	263.07 N	987.11 W	504,777.47	725,534.19	1.55	361.68	125.63	
12,732.00	90.52	356.52	11,891.24	265.07 N	987.23 W	504,779.47	725,534.07	1.55	363.68	125.63	
12,734.00	90.50	356.55	11,891.22	267.07 N	987.35 W	504,781.47	725,533.95	1.55	365.68	125.63	
12,736.00	90.49	356.57	11,891.20	269.06 N	987.47 W	504,783.46	725,533.83	1.55	367.68	125.63	
12,738.00	90.47	356.60	11,891.19	271.06 N	987.59 W	504,785.46	725,533.71	1.55	369.67	125.63	
12,740.00	90.45	356.62	11,891.17	273.06 N	987.71 W	504,787.46	725,533.59	1.55	371.67	125.63	
12,742.00	90.43	356.65	11,891.15	275.05 N	987.83 W	504,789.45	725,533.47	1.55	373.67	125.63	
12,744.00	90.41	356.67	11,891.14	277.05 N	987.94 W	504,791.45	725,533.36	1.55	375.67	125.63	
12,746.00	90.40	356.70	11,891.13	279.05 N	988.06 W	504,793.45	725,533.24	1.55	377.67	125.63	
12,748.00	90.38	356.72	11,891.11	281.04 N	988.17 W	504,795.44	725,533.13	1.55	379.66	125.63	
12,750.00	90.36	356.75	11,891.10	283.04 N	988.29 W	504,797.44	725,533.01	1.55	381.66	125.63	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
12,752.00	90.34	356.77	11,891.09	285.04 N	988.40 W	504,799.44	725,532.90	1.55	383.66	125.63	
12,754.00	90.32	356.80	11,891.08	287.03 N	988.51 W	504,801.43	725,532.79	1.55	385.66	125.63	
12,756.00	90.30	356.82	11,891.06	289.03 N	988.62 W	504,803.43	725,532.68	1.55	387.66	125.63	
12,758.00	90.29	356.85	11,891.05	291.03 N	988.73 W	504,805.43	725,532.57	1.55	389.65	125.63	
12,760.00	90.27	356.87	11,891.04	293.02 N	988.84 W	504,807.42	725,532.46	1.55	391.65	125.63	
12,762.00	90.25	356.90	11,891.04	295.02 N	988.95 W	504,809.42	725,532.35	1.55	393.65	125.63	
12,764.00	90.23	356.92	11,891.03	297.02 N	989.06 W	504,811.42	725,532.24	1.55	395.65	125.63	
12,766.00	90.21	356.95	11,891.02	299.02 N	989.17 W	504,813.42	725,532.13	1.55	397.65	125.63	
12,768.00	90.20	356.98	11,891.01	301.01 N	989.27 W	504,815.41	725,532.03	1.55	399.64	125.63	
12,770.00	90.18	357.00	11,891.01	303.01 N	989.38 W	504,817.41	725,531.92	1.55	401.64	125.63	
12,772.00	90.16	357.03	11,891.00	305.01 N	989.48 W	504,819.41	725,531.82	1.55	403.64	125.63	
12,774.00	90.14	357.05	11,890.99	307.00 N	989.59 W	504,821.40	725,531.71	1.55	405.64	125.63	
12,776.00	90.12	357.08	11,890.99	309.00 N	989.69 W	504,823.40	725,531.61	1.55	407.63	125.63	
12,778.00	90.11	357.10	11,890.99	311.00 N	989.79 W	504,825.40	725,531.51	1.55	409.63	125.63	
12,780.00	90.09	357.13	11,890.98	313.00 N	989.89 W	504,827.40	725,531.41	1.55	411.63	125.63	
12,782.00	90.07	357.15	11,890.98	314.99 N	989.99 W	504,829.39	725,531.31	1.55	413.63	125.63	
12,784.00	90.05	357.18	11,890.98	316.99 N	990.09 W	504,831.39	725,531.21	1.55	415.62	125.63	
12,786.00	90.03	357.20	11,890.98	318.99 N	990.19 W	504,833.39	725,531.11	1.55	417.62	125.63	
12,788.00	90.01	357.23	11,890.98	320.99 N	990.28 W	504,835.39	725,531.02	1.55	419.62	125.63	
12,790.00	90.00	357.25	11,890.98	322.98 N	990.38 W	504,837.38	725,530.92	1.55	421.61	125.63	
12,792.00	89.98	357.28	11,890.98	324.98 N	990.48 W	504,839.38	725,530.82	1.55	423.61	125.63	
12,794.00	89.96	357.30	11,890.98	326.98 N	990.57 W	504,841.38	725,530.73	1.55	425.61	125.63	
12,796.00	89.94	357.33	11,890.98	328.98 N	990.66 W	504,843.38	725,530.64	1.55	427.61	125.63	
12,798.00	89.92	357.35	11,890.98	330.98 N	990.76 W	504,845.38	725,530.54	1.55	429.60	125.63	
12,800.00	89.91	357.38	11,890.98	332.97 N	990.85 W	504,847.37	725,530.45	1.55	431.60	125.63	
12,802.00	89.89	357.40	11,890.99	334.97 N	990.94 W	504,849.37	725,530.36	1.55	433.60	125.63	
12,804.00	89.87	357.43	11,890.99	336.97 N	991.03 W	504,851.37	725,530.27	1.55	435.59	125.63	
12,806.00	89.86	357.45	11,891.00	338.97 N	991.12 W	504,853.37	725,530.18	1.13	437.59	120.88	
12,808.00	89.85	357.47	11,891.00	340.97 N	991.21 W	504,855.37	725,530.09	1.13	439.59	120.88	
12,810.00	89.84	357.49	11,891.01	342.96 N	991.30 W	504,857.36	725,530.00	1.13	441.58	120.88	
12,812.00	89.82	357.51	11,891.01	344.96 N	991.38 W	504,859.36	725,529.92	1.13	443.58	120.88	
12,814.00	89.81	357.53	11,891.02	346.96 N	991.47 W	504,861.36	725,529.83	1.13	445.58	120.88	
12,816.00	89.80	357.55	11,891.03	348.96 N	991.56 W	504,863.36	725,529.74	1.13	447.57	120.88	
12,818.00	89.79	357.57	11,891.03	350.96 N	991.64 W	504,865.36	725,529.66	1.13	449.57	120.87	
12,820.00	89.78	357.58	11,891.04	352.95 N	991.73 W	504,867.35	725,529.57	1.13	451.57	120.87	
12,822.00	89.77	357.60	11,891.05	354.95 N	991.81 W	504,869.35	725,529.49	1.13	453.56	120.87	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
12,824.00	89.75	357.62	11,891.06	356.95 N	991.89 W	504,871.35	725,529.41	1.13	455.56	120.87	
12,826.00	89.74	357.64	11,891.07	358.95 N	991.98 W	504,873.35	725,529.32	1.13	457.56	120.87	
12,828.00	89.73	357.66	11,891.08	360.95 N	992.06 W	504,875.35	725,529.24	1.13	459.55	120.87	
12,830.00	89.72	357.68	11,891.08	362.95 N	992.14 W	504,877.35	725,529.16	1.13	461.55	120.87	
12,832.00	89.71	357.70	11,891.09	364.94 N	992.22 W	504,879.34	725,529.08	1.13	463.54	120.87	
12,834.00	89.70	357.72	11,891.11	366.94 N	992.30 W	504,881.34	725,529.00	1.13	465.54	120.87	
12,836.00	89.68	357.74	11,891.12	368.94 N	992.38 W	504,883.34	725,528.92	1.13	467.54	120.87	
12,838.00	89.67	357.76	11,891.13	370.94 N	992.46 W	504,885.34	725,528.84	1.13	469.53	120.87	
12,840.00	89.66	357.78	11,891.14	372.94 N	992.53 W	504,887.34	725,528.77	1.13	471.53	120.87	
12,842.00	89.65	357.80	11,891.15	374.94 N	992.61 W	504,889.34	725,528.69	1.13	473.52	120.87	
12,844.00	89.64	357.82	11,891.16	376.93 N	992.69 W	504,891.33	725,528.61	1.13	475.52	120.87	
12,846.00	89.63	357.84	11,891.18	378.93 N	992.76 W	504,893.33	725,528.54	1.13	477.52	120.87	
12,848.00	89.62	357.86	11,891.19	380.93 N	992.84 W	504,895.33	725,528.46	1.13	479.51	120.87	
12,850.00	89.60	357.88	11,891.20	382.93 N	992.91 W	504,897.33	725,528.39	1.13	481.51	120.87	
12,852.00	89.59	357.89	11,891.22	384.93 N	992.99 W	504,899.33	725,528.31	1.13	483.50	120.87	
12,854.00	89.58	357.91	11,891.23	386.93 N	993.06 W	504,901.33	725,528.24	1.13	485.50	120.87	
12,856.00	89.57	357.93	11,891.25	388.93 N	993.13 W	504,903.33	725,528.17	1.13	487.50	120.87	
12,858.00	89.56	357.95	11,891.26	390.92 N	993.20 W	504,905.32	725,528.10	1.13	489.49	120.87	
12,860.00	89.55	357.97	11,891.28	392.92 N	993.28 W	504,907.32	725,528.02	1.13	491.49	120.87	
12,862.00	89.53	357.99	11,891.29	394.92 N	993.35 W	504,909.32	725,527.95	1.13	493.48	120.87	
12,864.00	89.52	358.01	11,891.31	396.92 N	993.42 W	504,911.32	725,527.88	1.13	495.48	120.87	
12,866.00	89.51	358.03	11,891.33	398.92 N	993.49 W	504,913.32	725,527.81	1.13	497.47	120.87	
12,868.00	89.50	358.05	11,891.34	400.92 N	993.55 W	504,915.32	725,527.75	1.13	499.47	120.87	
12,870.00	89.49	358.07	11,891.36	402.92 N	993.62 W	504,917.32	725,527.68	1.13	501.46	120.87	
12,872.00	89.48	358.09	11,891.38	404.92 N	993.69 W	504,919.32	725,527.61	1.13	503.46	120.87	
12,874.00	89.46	358.11	11,891.40	406.91 N	993.75 W	504,921.31	725,527.55	1.13	505.45	120.87	
12,876.00	89.45	358.13	11,891.42	408.91 N	993.82 W	504,923.31	725,527.48	1.13	507.45	120.87	
12,878.00	89.44	358.15	11,891.44	410.91 N	993.89 W	504,925.31	725,527.41	1.13	509.44	120.87	
12,880.00	89.43	358.17	11,891.46	412.91 N	993.95 W	504,927.31	725,527.35	1.13	511.44	120.87	
12,882.00	89.42	358.19	11,891.48	414.91 N	994.01 W	504,929.31	725,527.29	1.13	513.44	120.87	
12,884.00	89.41	358.20	11,891.50	416.91 N	994.08 W	504,931.31	725,527.22	1.13	515.43	120.87	
12,886.00	89.40	358.22	11,891.52	418.91 N	994.14 W	504,933.31	725,527.16	1.13	517.43	120.87	
12,888.00	89.38	358.24	11,891.54	420.91 N	994.20 W	504,935.31	725,527.10	1.13	519.42	120.87	
12,890.00	89.37	358.26	11,891.56	422.91 N	994.26 W	504,937.31	725,527.04	1.13	521.41	120.87	
12,892.00	89.36	358.28	11,891.58	424.90 N	994.32 W	504,939.30	725,526.98	1.13	523.41	120.87	
12,894.00	89.35	358.30	11,891.61	426.90 N	994.38 W	504,941.30	725,526.92	1.13	525.40	120.87	
12,896.00	89.34	358.32	11,891.63	428.90 N	994.44 W	504,943.30	725,526.86	1.13	527.40	120.87	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
12,898.00	89.33	358.34	11,891.65	430.90 N	994.50 W	504,945.30	725,526.80	1.13	529.39	120.87	
12,900.00	89.33	358.35	11,891.68	432.90 N	994.56 W	504,947.30	725,526.74	0.47	531.39	75.29	
12,902.00	89.34	358.35	11,891.70	434.90 N	994.61 W	504,949.30	725,526.69	0.82	533.38	-3.72	
12,904.00	89.36	358.35	11,891.72	436.90 N	994.67 W	504,951.30	725,526.63	0.82	535.38	-3.72	
12,906.00	89.38	358.35	11,891.74	438.90 N	994.73 W	504,953.30	725,526.57	0.82	537.37	-3.72	
12,908.00	89.39	358.35	11,891.76	440.90 N	994.79 W	504,955.30	725,526.51	0.82	539.37	-3.72	
12,910.00	89.41	358.34	11,891.79	442.90 N	994.84 W	504,957.30	725,526.46	0.82	541.36	-3.72	
12,912.00	89.43	358.34	11,891.81	444.89 N	994.90 W	504,959.29	725,526.40	0.82	543.36	-3.72	
12,914.00	89.44	358.34	11,891.83	446.89 N	994.96 W	504,961.29	725,526.34	0.82	545.35	-3.72	
12,916.00	89.46	358.34	11,891.84	448.89 N	995.02 W	504,963.29	725,526.28	0.82	547.35	-3.72	
12,918.00	89.48	358.34	11,891.86	450.89 N	995.08 W	504,965.29	725,526.22	0.82	549.34	-3.72	
12,920.00	89.49	358.34	11,891.88	452.89 N	995.13 W	504,967.29	725,526.17	0.82	551.33	-3.72	
12,922.00	89.51	358.34	11,891.90	454.89 N	995.19 W	504,969.29	725,526.11	0.82	553.33	-3.72	
12,924.00	89.52	358.34	11,891.92	456.89 N	995.25 W	504,971.29	725,526.05	0.82	555.32	-3.72	
12,926.00	89.54	358.34	11,891.93	458.89 N	995.31 W	504,973.29	725,525.99	0.82	557.32	-3.72	
12,928.00	89.56	358.33	11,891.95	460.89 N	995.37 W	504,975.29	725,525.93	0.82	559.31	-3.72	
12,930.00	89.57	358.33	11,891.96	462.89 N	995.42 W	504,977.29	725,525.88	0.82	561.31	-3.72	
12,932.00	89.59	358.33	11,891.98	464.89 N	995.48 W	504,979.29	725,525.82	0.82	563.30	-3.72	
12,934.00	89.61	358.33	11,891.99	466.88 N	995.54 W	504,981.28	725,525.76	0.82	565.30	-3.72	
12,936.00	89.62	358.33	11,892.00	468.88 N	995.60 W	504,983.28	725,525.70	0.82	567.29	-3.72	
12,938.00	89.64	358.33	11,892.02	470.88 N	995.66 W	504,985.28	725,525.64	0.82	569.29	-3.72	
12,940.00	89.66	358.33	11,892.03	472.88 N	995.72 W	504,987.28	725,525.58	0.82	571.28	-3.72	
12,942.00	89.67	358.33	11,892.04	474.88 N	995.77 W	504,989.28	725,525.53	0.82	573.28	-3.72	
12,944.00	89.69	358.33	11,892.05	476.88 N	995.83 W	504,991.28	725,525.47	0.82	575.27	-3.72	
12,946.00	89.70	358.32	11,892.06	478.88 N	995.89 W	504,993.28	725,525.41	0.82	577.27	-3.72	
12,948.00	89.72	358.32	11,892.07	480.88 N	995.95 W	504,995.28	725,525.35	0.82	579.26	-3.72	
12,950.00	89.74	358.32	11,892.08	482.88 N	996.01 W	504,997.28	725,525.29	0.82	581.26	-3.72	
12,952.00	89.75	358.32	11,892.09	484.88 N	996.07 W	504,999.28	725,525.23	0.82	583.25	-3.72	
12,954.00	89.77	358.32	11,892.10	486.88 N	996.12 W	505,001.28	725,525.18	0.82	585.25	-3.72	
12,956.00	89.79	358.32	11,892.11	488.88 N	996.18 W	505,003.28	725,525.12	0.82	587.24	-3.72	
12,958.00	89.80	358.32	11,892.11	490.87 N	996.24 W	505,005.27	725,525.06	0.82	589.23	-3.72	
12,960.00	89.82	358.32	11,892.12	492.87 N	996.30 W	505,007.27	725,525.00	0.82	591.23	-3.72	
12,962.00	89.84	358.32	11,892.13	494.87 N	996.36 W	505,009.27	725,524.94	0.82	593.22	-3.72	
12,964.00	89.85	358.32	11,892.13	496.87 N	996.42 W	505,011.27	725,524.88	0.82	595.22	-3.72	
12,966.00	89.87	358.31	11,892.14	498.87 N	996.48 W	505,013.27	725,524.82	0.82	597.21	-3.72	
12,968.00	89.89	358.31	11,892.14	500.87 N	996.54 W	505,015.27	725,524.76	0.82	599.21	-3.72	
12,970.00	89.90	358.31	11,892.15	502.87 N	996.60 W	505,017.27	725,524.70	0.82	601.20	-3.72	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
12,972.00	89.92	358.31	11,892.15	504.87 N	996.65 W	505,019.27	725,524.65	0.82	603.20	-3.72	
12,974.00	89.93	358.31	11,892.15	506.87 N	996.71 W	505,021.27	725,524.59	0.82	605.19	-3.72	
12,976.00	89.95	358.31	11,892.15	508.87 N	996.77 W	505,023.27	725,524.53	0.82	607.19	-3.72	
12,978.00	89.97	358.31	11,892.15	510.87 N	996.83 W	505,025.27	725,524.47	0.82	609.18	-3.72	
12,980.00	89.98	358.31	11,892.16	512.86 N	996.89 W	505,027.26	725,524.41	0.82	611.18	-3.72	
12,982.00	90.00	358.31	11,892.16	514.86 N	996.95 W	505,029.26	725,524.35	0.82	613.17	-3.72	
12,984.00	90.02	358.30	11,892.16	516.86 N	997.01 W	505,031.26	725,524.29	0.82	615.17	-3.72	
12,986.00	90.03	358.30	11,892.15	518.86 N	997.07 W	505,033.26	725,524.23	0.82	617.16	-3.72	
12,988.00	90.05	358.30	11,892.15	520.86 N	997.13 W	505,035.26	725,524.17	0.82	619.16	-3.72	
12,990.00	90.07	358.30	11,892.15	522.86 N	997.19 W	505,037.26	725,524.11	0.82	621.15	-3.72	
12,992.00	90.08	358.30	11,892.15	524.86 N	997.25 W	505,039.26	725,524.05	0.82	623.15	-3.72	
12,994.00	90.09	358.31	11,892.15	526.86 N	997.30 W	505,041.26	725,524.00	0.62	625.14	45.73	
12,996.00	90.09	358.33	11,892.14	528.86 N	997.36 W	505,043.26	725,523.94	0.94	627.14	87.43	
12,998.00	90.09	358.35	11,892.14	530.86 N	997.42 W	505,045.26	725,523.88	0.94	629.13	87.43	
13,000.00	90.09	358.37	11,892.14	532.86 N	997.48 W	505,047.26	725,523.82	0.94	631.13	87.43	
13,002.00	90.09	358.38	11,892.13	534.86 N	997.54 W	505,049.26	725,523.76	0.94	633.12	87.43	
13,004.00	90.09	358.40	11,892.13	536.85 N	997.59 W	505,051.25	725,523.71	0.94	635.12	87.43	
13,006.00	90.10	358.42	11,892.13	538.85 N	997.65 W	505,053.25	725,523.65	0.94	637.11	87.43	
13,008.00	90.10	358.44	11,892.12	540.85 N	997.70 W	505,055.25	725,523.60	0.94	639.10	87.43	
13,010.00	90.10	358.46	11,892.12	542.85 N	997.76 W	505,057.25	725,523.54	0.94	641.10	87.43	
13,012.00	90.10	358.48	11,892.12	544.85 N	997.81 W	505,059.25	725,523.49	0.94	643.09	87.43	
13,014.00	90.10	358.50	11,892.11	546.85 N	997.86 W	505,061.25	725,523.44	0.94	645.09	87.43	
13,016.00	90.10	358.52	11,892.11	548.85 N	997.91 W	505,063.25	725,523.39	0.94	647.08	87.43	
13,018.00	90.10	358.53	11,892.11	550.85 N	997.97 W	505,065.25	725,523.33	0.94	649.08	87.43	
13,020.00	90.10	358.55	11,892.10	552.85 N	998.02 W	505,067.25	725,523.28	0.94	651.07	87.43	
13,022.00	90.10	358.57	11,892.10	554.85 N	998.07 W	505,069.25	725,523.23	0.94	653.06	87.43	
13,024.00	90.10	358.59	11,892.10	556.85 N	998.12 W	505,071.25	725,523.18	0.94	655.06	87.43	
13,026.00	90.10	358.61	11,892.09	558.85 N	998.16 W	505,073.25	725,523.14	0.94	657.05	87.43	
13,028.00	90.10	358.63	11,892.09	560.85 N	998.21 W	505,075.25	725,523.09	0.94	659.05	87.43	
13,030.00	90.11	358.65	11,892.08	562.85 N	998.26 W	505,077.25	725,523.04	0.94	661.04	87.43	
13,032.00	90.11	358.67	11,892.08	564.85 N	998.31 W	505,079.25	725,522.99	0.94	663.03	87.43	
13,034.00	90.11	358.68	11,892.08	566.84 N	998.35 W	505,081.24	725,522.95	0.94	665.03	87.43	
13,036.00	90.11	358.70	11,892.07	568.84 N	998.40 W	505,083.24	725,522.90	0.94	667.02	87.43	
13,038.00	90.11	358.72	11,892.07	570.84 N	998.44 W	505,085.24	725,522.86	0.94	669.02	87.43	
13,040.00	90.11	358.74	11,892.07	572.84 N	998.49 W	505,087.24	725,522.81	0.94	671.01	87.43	
13,042.00	90.11	358.76	11,892.06	574.84 N	998.53 W	505,089.24	725,522.77	0.94	673.00	87.43	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
13,044.00	90.11	358.78	11,892.06	576.84 N	998.58 W	505,091.24	725,522.72	0.94	675.00	87.43	
13,046.00	90.11	358.80	11,892.05	578.84 N	998.62 W	505,093.24	725,522.68	0.94	676.99	87.43	
13,048.00	90.11	358.82	11,892.05	580.84 N	998.66 W	505,095.24	725,522.64	0.94	678.98	87.43	
13,050.00	90.11	358.83	11,892.05	582.84 N	998.70 W	505,097.24	725,522.60	0.94	680.98	87.43	
13,052.00	90.11	358.85	11,892.04	584.84 N	998.74 W	505,099.24	725,522.56	0.94	682.97	87.43	
13,054.00	90.12	358.87	11,892.04	586.84 N	998.78 W	505,101.24	725,522.52	0.94	684.96	87.43	
13,056.00	90.12	358.89	11,892.03	588.84 N	998.82 W	505,103.24	725,522.48	0.94	686.96	87.43	
13,058.00	90.12	358.91	11,892.03	590.84 N	998.86 W	505,105.24	725,522.44	0.94	688.95	87.43	
13,060.00	90.12	358.93	11,892.03	592.84 N	998.90 W	505,107.24	725,522.40	0.94	690.94	87.43	
13,062.00	90.12	358.95	11,892.02	594.84 N	998.93 W	505,109.24	725,522.37	0.94	692.94	87.43	
13,064.00	90.12	358.97	11,892.02	596.84 N	998.97 W	505,111.24	725,522.33	0.94	694.93	87.43	
13,066.00	90.12	358.98	11,892.01	598.84 N	999.00 W	505,113.24	725,522.30	0.94	696.92	87.43	
13,068.00	90.12	359.00	11,892.01	600.84 N	999.04 W	505,115.24	725,522.26	0.94	698.92	87.43	
13,070.00	90.12	359.02	11,892.00	602.84 N	999.07 W	505,117.24	725,522.23	0.94	700.91	87.43	
13,072.00	90.12	359.04	11,892.00	604.84 N	999.11 W	505,119.24	725,522.19	0.94	702.90	87.43	
13,074.00	90.12	359.06	11,892.00	606.84 N	999.14 W	505,121.24	725,522.16	0.94	704.89	87.43	
13,076.00	90.12	359.08	11,891.99	608.84 N	999.17 W	505,123.24	725,522.13	0.94	706.89	87.43	
13,078.00	90.13	359.10	11,891.99	610.84 N	999.21 W	505,125.24	725,522.09	0.94	708.88	87.43	
13,080.00	90.13	359.12	11,891.98	612.84 N	999.24 W	505,127.24	725,522.06	0.94	710.87	87.43	
13,082.00	90.13	359.13	11,891.98	614.84 N	999.27 W	505,129.24	725,522.03	0.94	712.87	87.43	
13,084.00	90.13	359.15	11,891.97	616.84 N	999.30 W	505,131.24	725,522.00	0.94	714.86	87.43	
13,086.00	90.13	359.17	11,891.97	618.84 N	999.33 W	505,133.24	725,521.97	0.94	716.85	87.43	
13,088.00	90.13	359.19	11,891.96	620.83 N	999.36 W	505,135.23	725,521.94	0.94	718.84	87.43	
13,090.00	90.10	359.17	11,891.96	622.83 N	999.38 W	505,137.23	725,521.92	1.50	720.84	-149.66	
13,092.00	90.08	359.16	11,891.96	624.83 N	999.41 W	505,139.23	725,521.89	1.50	722.83	-149.66	
13,094.00	90.05	359.14	11,891.96	626.83 N	999.44 W	505,141.23	725,521.86	1.50	724.82	-149.66	
13,096.00	90.03	359.13	11,891.95	628.83 N	999.47 W	505,143.23	725,521.83	1.50	726.81	-149.66	
13,098.00	90.00	359.11	11,891.95	630.83 N	999.50 W	505,145.23	725,521.80	1.50	728.81	-149.66	
13,100.00	89.97	359.10	11,891.95	632.83 N	999.53 W	505,147.23	725,521.77	1.50	730.80	-149.66	
13,102.00	89.95	359.08	11,891.96	634.83 N	999.57 W	505,149.23	725,521.73	1.50	732.79	-149.66	
13,104.00	89.92	359.07	11,891.96	636.83 N	999.60 W	505,151.23	725,521.70	1.50	734.78	-149.66	
13,106.00	89.90	359.05	11,891.96	638.83 N	999.63 W	505,153.23	725,521.67	1.50	736.78	-149.66	
13,108.00	89.87	359.04	11,891.96	640.83 N	999.66 W	505,155.23	725,521.64	1.50	738.77	-149.66	
13,110.00	89.85	359.02	11,891.97	642.83 N	999.70 W	505,157.23	725,521.60	1.50	740.76	-149.66	
13,112.00	89.82	359.01	11,891.98	644.83 N	999.73 W	505,159.23	725,521.57	1.50	742.75	-149.66	
13,114.00	89.79	358.99	11,891.98	646.83 N	999.77 W	505,161.23	725,521.53	1.50	744.75	-149.66	
13,116.00	89.77	358.98	11,891.99	648.83 N	999.80 W	505,163.23	725,521.50	1.50	746.74	-149.66	



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				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
13,118.00	89.74	358.96	11,892.00	650.83 N	999.84 W	505,165.23	725,521.46	1.50	748.73	-149.66	
13,120.00	89.72	358.95	11,892.01	652.83 N	999.88 W	505,167.23	725,521.42	1.50	750.73	-149.66	
13,122.00	89.69	358.93	11,892.02	654.83 N	999.91 W	505,169.23	725,521.39	1.50	752.72	-149.66	
13,124.00	89.66	358.92	11,892.03	656.83 N	999.95 W	505,171.23	725,521.35	1.50	754.71	-149.66	
13,126.00	89.64	358.90	11,892.04	658.83 N	999.99 W	505,173.23	725,521.31	1.50	756.71	-149.66	
13,128.00	89.61	358.89	11,892.05	660.83 N	1,000.03 W	505,175.23	725,521.27	1.50	758.70	-149.66	
13,130.00	89.59	358.87	11,892.07	662.83 N	1,000.07 W	505,177.23	725,521.23	1.50	760.69	-149.66	
13,132.00	89.56	358.86	11,892.08	664.83 N	1,000.11 W	505,179.23	725,521.19	1.50	762.69	-149.66	
13,134.00	89.53	358.84	11,892.10	666.83 N	1,000.15 W	505,181.23	725,521.15	1.50	764.68	-149.66	
13,136.00	89.51	358.83	11,892.12	668.83 N	1,000.19 W	505,183.23	725,521.11	1.50	766.67	-149.66	
13,138.00	89.48	358.81	11,892.13	670.83 N	1,000.23 W	505,185.23	725,521.07	1.50	768.67	-149.66	
13,140.00	89.46	358.80	11,892.15	672.83 N	1,000.27 W	505,187.23	725,521.03	1.50	770.66	-149.66	
13,142.00	89.43	358.78	11,892.17	674.83 N	1,000.31 W	505,189.23	725,520.99	1.50	772.65	-149.66	
13,144.00	89.40	358.77	11,892.19	676.83 N	1,000.35 W	505,191.23	725,520.95	1.50	774.65	-149.66	
13,146.00	89.38	358.75	11,892.21	678.82 N	1,000.40 W	505,193.22	725,520.90	1.50	776.64	-149.66	
13,148.00	89.35	358.74	11,892.24	680.82 N	1,000.44 W	505,195.22	725,520.86	1.50	778.63	-149.66	
13,150.00	89.33	358.72	11,892.26	682.82 N	1,000.49 W	505,197.22	725,520.81	1.50	780.63	-149.66	
13,152.00	89.30	358.70	11,892.28	684.82 N	1,000.53 W	505,199.22	725,520.77	1.50	782.62	-149.66	
13,154.00	89.28	358.69	11,892.31	686.82 N	1,000.58 W	505,201.22	725,520.72	1.50	784.61	-149.66	
13,156.00	89.25	358.67	11,892.33	688.82 N	1,000.62 W	505,203.22	725,520.68	1.50	786.61	-149.66	
13,158.00	89.22	358.66	11,892.36	690.82 N	1,000.67 W	505,205.22	725,520.63	1.50	788.60	-149.66	
13,160.00	89.20	358.64	11,892.39	692.82 N	1,000.72 W	505,207.22	725,520.58	1.50	790.60	-149.66	
13,162.00	89.17	358.63	11,892.42	694.82 N	1,000.76 W	505,209.22	725,520.54	1.50	792.59	-149.66	
13,164.00	89.15	358.61	11,892.45	696.82 N	1,000.81 W	505,211.22	725,520.49	1.50	794.58	-149.66	
13,166.00	89.12	358.60	11,892.48	698.82 N	1,000.86 W	505,213.22	725,520.44	1.50	796.58	-149.66	
13,168.00	89.09	358.58	11,892.51	700.82 N	1,000.91 W	505,215.22	725,520.39	1.50	798.57	-149.66	
13,170.00	89.07	358.57	11,892.54	702.82 N	1,000.96 W	505,217.22	725,520.34	1.50	800.56	-149.66	
13,172.00	89.04	358.55	11,892.57	704.81 N	1,001.01 W	505,219.21	725,520.29	1.50	802.56	-149.66	
13,174.00	89.02	358.54	11,892.61	706.81 N	1,001.06 W	505,221.21	725,520.24	1.50	804.55	-149.66	
13,176.00	88.99	358.52	11,892.64	708.81 N	1,001.11 W	505,223.21	725,520.19	1.50	806.55	-149.66	
13,178.00	88.96	358.51	11,892.68	710.81 N	1,001.16 W	505,225.21	725,520.14	1.50	808.54	-149.65	
13,180.00	88.94	358.49	11,892.71	712.81 N	1,001.22 W	505,227.21	725,520.08	1.50	810.53	-149.65	
13,182.00	88.91	358.48	11,892.75	714.81 N	1,001.27 W	505,229.21	725,520.03	1.50	812.53	-149.65	
13,184.00	88.91	358.48	11,892.79	716.81 N	1,001.32 W	505,231.21	725,519.98	0.15	814.52	-130.59	
13,186.00	88.93	358.49	11,892.83	718.81 N	1,001.37 W	505,233.21	725,519.93	1.23	816.52	25.91	
13,188.00	88.96	358.50	11,892.86	720.81 N	1,001.43 W	505,235.21	725,519.87	1.23	818.51	25.91	
13,190.00	88.98	358.51	11,892.90	722.81 N	1,001.48 W	505,237.21	725,519.82	1.23	820.50	25.91	



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				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
13,192.00	89.00	358.52	11,892.93	724.80 N	1,001.53 W	505,239.20	725,519.77	1.23	822.50	25.91	
13,194.00	89.02	358.53	11,892.97	726.80 N	1,001.58 W	505,241.20	725,519.72	1.23	824.49	25.91	
13,196.00	89.04	358.54	11,893.00	728.80 N	1,001.63 W	505,243.20	725,519.67	1.23	826.49	25.91	
13,198.00	89.07	358.55	11,893.04	730.80 N	1,001.69 W	505,245.20	725,519.61	1.23	828.48	25.91	
13,200.00	89.09	358.56	11,893.07	732.80 N	1,001.74 W	505,247.20	725,519.56	1.23	830.47	25.91	
13,202.00	89.11	358.57	11,893.10	734.80 N	1,001.79 W	505,249.20	725,519.51	1.23	832.47	25.91	
13,204.00	89.13	358.58	11,893.13	736.80 N	1,001.84 W	505,251.20	725,519.46	1.23	834.46	25.91	
13,206.00	89.15	358.59	11,893.16	738.80 N	1,001.88 W	505,253.20	725,519.42	1.23	836.46	25.91	
13,208.00	89.18	358.60	11,893.19	740.80 N	1,001.93 W	505,255.20	725,519.37	1.23	838.45	25.91	
13,210.00	89.20	358.61	11,893.22	742.80 N	1,001.98 W	505,257.20	725,519.32	1.23	840.44	25.91	
13,212.00	89.22	358.63	11,893.24	744.80 N	1,002.03 W	505,259.20	725,519.27	1.23	842.44	25.91	
13,214.00	89.24	358.64	11,893.27	746.80 N	1,002.08 W	505,261.20	725,519.22	1.23	844.43	25.91	
13,216.00	89.26	358.65	11,893.30	748.79 N	1,002.13 W	505,263.19	725,519.17	1.23	846.42	25.91	
13,218.00	89.29	358.66	11,893.32	750.79 N	1,002.17 W	505,265.19	725,519.13	1.23	848.42	25.91	
13,220.00	89.31	358.67	11,893.35	752.79 N	1,002.22 W	505,267.19	725,519.08	1.23	850.41	25.91	
13,222.00	89.33	358.68	11,893.37	754.79 N	1,002.27 W	505,269.19	725,519.03	1.23	852.41	25.91	
13,224.00	89.35	358.69	11,893.39	756.79 N	1,002.31 W	505,271.19	725,518.99	1.23	854.40	25.91	
13,226.00	89.38	358.70	11,893.42	758.79 N	1,002.36 W	505,273.19	725,518.94	1.23	856.39	25.91	
13,228.00	89.40	358.71	11,893.44	760.79 N	1,002.40 W	505,275.19	725,518.90	1.23	858.39	25.90	
13,230.00	89.42	358.72	11,893.46	762.79 N	1,002.45 W	505,277.19	725,518.85	1.23	860.38	25.90	
13,232.00	89.44	358.73	11,893.48	764.79 N	1,002.49 W	505,279.19	725,518.81	1.23	862.37	25.90	
13,234.00	89.46	358.74	11,893.50	766.79 N	1,002.53 W	505,281.19	725,518.77	1.23	864.37	25.90	
13,236.00	89.49	358.75	11,893.52	768.79 N	1,002.58 W	505,283.19	725,518.72	1.23	866.36	25.90	
13,238.00	89.51	358.77	11,893.53	770.79 N	1,002.62 W	505,285.19	725,518.68	1.23	868.36	25.90	
13,240.00	89.53	358.78	11,893.55	772.79 N	1,002.66 W	505,287.19	725,518.64	1.23	870.35	25.90	
13,242.00	89.55	358.79	11,893.57	774.79 N	1,002.71 W	505,289.19	725,518.59	1.23	872.34	25.90	
13,244.00	89.57	358.80	11,893.58	776.79 N	1,002.75 W	505,291.19	725,518.55	1.23	874.34	25.90	
13,246.00	89.60	358.81	11,893.60	778.79 N	1,002.79 W	505,293.19	725,518.51	1.23	876.33	25.90	
13,248.00	89.62	358.82	11,893.61	780.79 N	1,002.83 W	505,295.19	725,518.47	1.23	878.32	25.90	
13,250.00	89.64	358.83	11,893.62	782.78 N	1,002.87 W	505,297.18	725,518.43	1.23	880.32	25.90	
13,252.00	89.66	358.84	11,893.63	784.78 N	1,002.91 W	505,299.18	725,518.39	1.23	882.31	25.90	
13,254.00	89.68	358.85	11,893.65	786.78 N	1,002.95 W	505,301.18	725,518.35	1.23	884.30	25.90	
13,256.00	89.71	358.86	11,893.66	788.78 N	1,002.99 W	505,303.18	725,518.31	1.23	886.30	25.90	
13,258.00	89.73	358.87	11,893.67	790.78 N	1,003.03 W	505,305.18	725,518.27	1.23	888.29	25.90	
13,260.00	89.75	358.88	11,893.68	792.78 N	1,003.07 W	505,307.18	725,518.23	1.23	890.28	25.90	
13,262.00	89.77	358.89	11,893.68	794.78 N	1,003.11 W	505,309.18	725,518.19	1.23	892.28	25.90	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
13,264.00	89.80	358.90	11,893.69	796.78 N	1,003.15 W	505,311.18	725,518.15	1.23	894.27	25.90	
13,266.00	89.82	358.92	11,893.70	798.78 N	1,003.19 W	505,313.18	725,518.11	1.23	896.26	25.90	
13,268.00	89.84	358.93	11,893.70	800.78 N	1,003.23 W	505,315.18	725,518.07	1.23	898.26	25.90	
13,270.00	89.86	358.94	11,893.71	802.78 N	1,003.26 W	505,317.18	725,518.04	1.23	900.25	25.90	
13,272.00	89.88	358.95	11,893.71	804.78 N	1,003.30 W	505,319.18	725,518.00	1.23	902.24	25.90	
13,274.00	89.91	358.96	11,893.72	806.78 N	1,003.34 W	505,321.18	725,517.96	1.23	904.24	25.90	
13,276.00	89.93	358.97	11,893.72	808.78 N	1,003.37 W	505,323.18	725,517.93	1.23	906.23	25.90	
13,278.00	89.95	358.98	11,893.72	810.78 N	1,003.41 W	505,325.18	725,517.89	1.23	908.22	25.90	
13,280.00	89.95	359.05	11,893.72	812.78 N	1,003.44 W	505,327.18	725,517.86	3.43	910.21	91.58	
13,282.00	89.95	359.12	11,893.73	814.78 N	1,003.48 W	505,329.18	725,517.82	3.43	912.21	91.58	
13,284.00	89.94	359.19	11,893.73	816.78 N	1,003.50 W	505,331.18	725,517.80	3.43	914.20	91.58	
13,286.00	89.94	359.25	11,893.73	818.78 N	1,003.53 W	505,333.18	725,517.77	3.43	916.19	91.58	
13,288.00	89.94	359.32	11,893.73	820.78 N	1,003.56 W	505,335.18	725,517.74	3.43	918.18	91.58	
13,290.00	89.94	359.39	11,893.73	822.78 N	1,003.58 W	505,337.18	725,517.72	3.43	920.18	91.58	
13,292.00	89.94	359.46	11,893.74	824.78 N	1,003.60 W	505,339.18	725,517.70	3.43	922.17	91.58	
13,294.00	89.93	359.53	11,893.74	826.78 N	1,003.62 W	505,341.18	725,517.68	3.43	924.16	91.58	
13,296.00	89.93	359.60	11,893.74	828.78 N	1,003.63 W	505,343.18	725,517.67	3.43	926.15	91.58	
13,298.00	89.93	359.67	11,893.74	830.78 N	1,003.65 W	505,345.18	725,517.65	3.43	928.14	91.58	
13,300.00	89.93	359.73	11,893.75	832.78 N	1,003.66 W	505,347.18	725,517.64	3.43	930.13	91.58	
13,302.00	89.93	359.80	11,893.75	834.78 N	1,003.66 W	505,349.18	725,517.64	3.43	932.12	91.58	
13,304.00	89.93	359.87	11,893.75	836.78 N	1,003.67 W	505,351.18	725,517.63	3.43	934.11	91.58	
13,306.00	89.92	359.94	11,893.75	838.78 N	1,003.67 W	505,353.18	725,517.63	3.43	936.10	91.58	
13,308.00	89.92	0.01	11,893.76	840.78 N	1,003.67 W	505,355.18	725,517.63	3.43	938.09	91.58	
13,310.00	89.92	0.08	11,893.76	842.78 N	1,003.67 W	505,357.18	725,517.63	3.43	940.08	91.58	
13,312.00	89.92	0.15	11,893.76	844.78 N	1,003.67 W	505,359.18	725,517.63	3.43	942.07	91.58	
13,314.00	89.92	0.22	11,893.76	846.78 N	1,003.66 W	505,361.18	725,517.64	3.43	944.06	91.58	
13,316.00	89.91	0.28	11,893.77	848.78 N	1,003.65 W	505,363.18	725,517.65	3.43	946.05	91.58	
13,318.00	89.91	0.35	11,893.77	850.78 N	1,003.64 W	505,365.18	725,517.66	3.43	948.04	91.58	
13,320.00	89.91	0.42	11,893.77	852.78 N	1,003.63 W	505,367.18	725,517.67	3.43	950.03	91.58	
13,322.00	89.91	0.49	11,893.78	854.78 N	1,003.61 W	505,369.18	725,517.69	3.43	952.01	91.58	
13,324.00	89.91	0.56	11,893.78	856.78 N	1,003.59 W	505,371.18	725,517.71	3.43	954.00	91.58	
13,326.00	89.90	0.63	11,893.78	858.78 N	1,003.57 W	505,373.18	725,517.73	3.43	955.99	91.58	
13,328.00	89.90	0.70	11,893.79	860.78 N	1,003.55 W	505,375.18	725,517.75	3.43	957.98	91.58	
13,330.00	89.90	0.76	11,893.79	862.78 N	1,003.52 W	505,377.18	725,517.78	3.43	959.96	91.58	
13,332.00	89.90	0.83	11,893.79	864.78 N	1,003.50 W	505,379.18	725,517.80	3.43	961.95	91.58	
13,334.00	89.90	0.90	11,893.80	866.78 N	1,003.47 W	505,381.18	725,517.83	3.43	963.94	91.58	
13,336.00	89.90	0.97	11,893.80	868.78 N	1,003.43 W	505,383.18	725,517.87	3.43	965.92	91.58	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
13,338.00	89.89	1.04	11,893.80	870.78 N	1,003.40 W	505,385.18	725,517.90	3.43	967.91	91.58	
13,340.00	89.89	1.11	11,893.81	872.78 N	1,003.36 W	505,387.18	725,517.94	3.43	969.89	91.58	
13,342.00	89.89	1.18	11,893.81	874.78 N	1,003.32 W	505,389.18	725,517.98	3.43	971.88	91.58	
13,344.00	89.89	1.24	11,893.82	876.77 N	1,003.28 W	505,391.17	725,518.02	3.43	973.86	91.58	
13,346.00	89.89	1.31	11,893.82	878.77 N	1,003.23 W	505,393.17	725,518.07	3.43	975.85	91.58	
13,348.00	89.88	1.38	11,893.82	880.77 N	1,003.19 W	505,395.17	725,518.11	3.43	977.83	91.58	
13,350.00	89.88	1.45	11,893.83	882.77 N	1,003.14 W	505,397.17	725,518.16	3.43	979.82	91.58	
13,352.00	89.88	1.52	11,893.83	884.77 N	1,003.09 W	505,399.17	725,518.21	3.43	981.80	91.58	
13,354.00	89.88	1.59	11,893.84	886.77 N	1,003.03 W	505,401.17	725,518.27	3.43	983.78	91.58	
13,356.00	89.88	1.66	11,893.84	888.77 N	1,002.98 W	505,403.17	725,518.32	3.43	985.77	91.58	
13,358.00	89.87	1.73	11,893.85	890.77 N	1,002.92 W	505,405.17	725,518.38	3.43	987.75	91.58	
13,360.00	89.87	1.79	11,893.85	892.77 N	1,002.86 W	505,407.17	725,518.44	3.43	989.73	91.58	
13,362.00	89.87	1.86	11,893.85	894.77 N	1,002.79 W	505,409.17	725,518.51	3.43	991.72	91.58	
13,364.00	89.87	1.93	11,893.86	896.77 N	1,002.73 W	505,411.17	725,518.57	3.43	993.70	91.58	
13,366.00	89.87	2.00	11,893.86	898.77 N	1,002.66 W	505,413.17	725,518.64	3.43	995.68	91.58	
13,368.00	89.86	2.07	11,893.87	900.76 N	1,002.59 W	505,415.16	725,518.71	3.43	997.66	91.58	
13,370.00	89.86	2.14	11,893.87	902.76 N	1,002.51 W	505,417.16	725,518.79	3.43	999.64	91.58	
13,372.00	89.86	2.21	11,893.88	904.76 N	1,002.44 W	505,419.16	725,518.86	3.43	1,001.62	91.58	
13,374.00	89.88	2.26	11,893.88	906.76 N	1,002.36 W	505,421.16	725,518.94	2.88	1,003.60	73.22	
13,376.00	89.91	2.30	11,893.89	908.76 N	1,002.28 W	505,423.16	725,519.02	2.73	1,005.58	49.84	
13,378.00	89.95	2.34	11,893.89	910.76 N	1,002.20 W	505,425.16	725,519.10	2.73	1,007.56	49.84	
13,380.00	89.98	2.39	11,893.89	912.76 N	1,002.12 W	505,427.16	725,519.18	2.73	1,009.54	49.84	
13,382.00	90.02	2.43	11,893.89	914.75 N	1,002.03 W	505,429.15	725,519.27	2.73	1,011.52	49.84	
13,384.00	90.05	2.47	11,893.89	916.75 N	1,001.95 W	505,431.15	725,519.35	2.73	1,013.50	49.84	
13,386.00	90.09	2.51	11,893.89	918.75 N	1,001.86 W	505,433.15	725,519.44	2.73	1,015.48	49.84	
13,388.00	90.12	2.55	11,893.88	920.75 N	1,001.77 W	505,435.15	725,519.53	2.73	1,017.46	49.84	
13,390.00	90.16	2.59	11,893.88	922.75 N	1,001.68 W	505,437.15	725,519.62	2.73	1,019.44	49.84	
13,392.00	90.19	2.64	11,893.87	924.74 N	1,001.59 W	505,439.14	725,519.71	2.73	1,021.42	49.84	
13,394.00	90.23	2.68	11,893.86	926.74 N	1,001.50 W	505,441.14	725,519.80	2.73	1,023.39	49.84	
13,396.00	90.26	2.72	11,893.86	928.74 N	1,001.40 W	505,443.14	725,519.90	2.73	1,025.37	49.84	
13,398.00	90.30	2.76	11,893.85	930.74 N	1,001.31 W	505,445.14	725,519.99	2.73	1,027.35	49.84	
13,400.00	90.33	2.80	11,893.83	932.73 N	1,001.21 W	505,447.13	725,520.09	2.73	1,029.33	49.85	
13,402.00	90.37	2.84	11,893.82	934.73 N	1,001.11 W	505,449.13	725,520.19	2.73	1,031.30	49.85	
13,404.00	90.41	2.89	11,893.81	936.73 N	1,001.01 W	505,451.13	725,520.29	2.73	1,033.28	49.85	
13,406.00	90.44	2.93	11,893.79	938.73 N	1,000.91 W	505,453.13	725,520.39	2.73	1,035.26	49.85	
13,408.00	90.48	2.97	11,893.78	940.72 N	1,000.81 W	505,455.12	725,520.49	2.73	1,037.23	49.85	
13,410.00	90.51	3.01	11,893.76	942.72 N	1,000.70 W	505,457.12	725,520.60	2.73	1,039.21	49.85	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
13,412.00	90.55	3.05	11,893.74	944.72 N	1,000.60 W	505,459.12	725,520.70	2.73	1,041.19	49.85	
13,414.00	90.58	3.09	11,893.72	946.72 N	1,000.49 W	505,461.12	725,520.81	2.73	1,043.16	49.85	
13,416.00	90.62	3.14	11,893.70	948.71 N	1,000.38 W	505,463.11	725,520.92	2.73	1,045.14	49.85	
13,418.00	90.65	3.18	11,893.68	950.71 N	1,000.27 W	505,465.11	725,521.03	2.73	1,047.11	49.85	
13,420.00	90.69	3.22	11,893.66	952.71 N	1,000.16 W	505,467.11	725,521.14	2.73	1,049.09	49.85	
13,422.00	90.72	3.26	11,893.63	954.70 N	1,000.05 W	505,469.10	725,521.25	2.73	1,051.06	49.85	
13,424.00	90.76	3.30	11,893.61	956.70 N	999.93 W	505,471.10	725,521.37	2.73	1,053.04	49.85	
13,426.00	90.79	3.34	11,893.58	958.70 N	999.82 W	505,473.10	725,521.48	2.73	1,055.01	49.85	
13,428.00	90.83	3.39	11,893.55	960.69 N	999.70 W	505,475.09	725,521.60	2.73	1,056.99	49.85	
13,430.00	90.86	3.43	11,893.52	962.69 N	999.58 W	505,477.09	725,521.72	2.73	1,058.96	49.85	
13,432.00	90.90	3.47	11,893.49	964.68 N	999.46 W	505,479.08	725,521.84	2.73	1,060.94	49.85	
13,434.00	90.93	3.51	11,893.46	966.68 N	999.34 W	505,481.08	725,521.96	2.73	1,062.91	49.85	
13,436.00	90.97	3.55	11,893.42	968.68 N	999.21 W	505,483.08	725,522.09	2.73	1,064.88	49.85	
13,438.00	91.00	3.59	11,893.39	970.67 N	999.09 W	505,485.07	725,522.21	2.73	1,066.85	49.85	
13,440.00	91.04	3.64	11,893.35	972.67 N	998.96 W	505,487.07	725,522.34	2.73	1,068.83	49.85	
13,442.00	91.07	3.68	11,893.32	974.66 N	998.84 W	505,489.06	725,522.46	2.73	1,070.80	49.86	
13,444.00	91.11	3.72	11,893.28	976.66 N	998.71 W	505,491.06	725,522.59	2.73	1,072.77	49.86	
13,446.00	91.14	3.76	11,893.24	978.65 N	998.58 W	505,493.05	725,522.72	2.73	1,074.74	49.86	
13,448.00	91.18	3.80	11,893.20	980.65 N	998.44 W	505,495.05	725,522.86	2.73	1,076.72	49.86	
13,450.00	91.21	3.84	11,893.16	982.64 N	998.31 W	505,497.04	725,522.99	2.73	1,078.69	49.86	
13,452.00	91.25	3.89	11,893.12	984.64 N	998.18 W	505,499.04	725,523.12	2.73	1,080.66	49.86	
13,454.00	91.28	3.93	11,893.07	986.63 N	998.04 W	505,501.03	725,523.26	2.73	1,082.63	49.86	
13,456.00	91.32	3.97	11,893.03	988.63 N	997.90 W	505,503.03	725,523.40	2.73	1,084.60	49.86	
13,458.00	91.35	4.01	11,892.98	990.62 N	997.76 W	505,505.02	725,523.54	2.73	1,086.57	49.86	
13,460.00	91.39	4.05	11,892.93	992.62 N	997.62 W	505,507.02	725,523.68	2.73	1,088.54	49.86	
13,462.00	91.42	4.09	11,892.88	994.61 N	997.48 W	505,509.01	725,523.82	2.73	1,090.51	49.86	
13,464.00	91.46	4.14	11,892.83	996.61 N	997.34 W	505,511.01	725,523.96	2.73	1,092.48	49.87	
13,466.00	91.49	4.18	11,892.78	998.60 N	997.19 W	505,513.00	725,524.11	2.73	1,094.45	49.87	
13,468.00	91.53	4.22	11,892.73	1,000.60 N	997.05 W	505,515.00	725,524.25	2.73	1,096.42	49.87	
13,470.00	91.50	4.18	11,892.67	1,002.59 N	996.90 W	505,516.99	725,524.40	2.66	1,098.39	-127.36	
13,472.00	91.47	4.14	11,892.62	1,004.58 N	996.75 W	505,518.98	725,524.55	2.66	1,100.35	-127.36	
13,474.00	91.43	4.09	11,892.57	1,006.58 N	996.61 W	505,520.98	725,524.69	2.66	1,102.32	-127.36	
13,476.00	91.40	4.05	11,892.52	1,008.57 N	996.47 W	505,522.97	725,524.83	2.66	1,104.29	-127.36	
13,478.00	91.37	4.01	11,892.47	1,010.57 N	996.33 W	505,524.97	725,524.97	2.66	1,106.26	-127.36	
13,480.00	91.34	3.97	11,892.43	1,012.56 N	996.19 W	505,526.96	725,525.11	2.66	1,108.23	-127.36	
13,482.00	91.30	3.92	11,892.38	1,014.56 N	996.05 W	505,528.96	725,525.25	2.66	1,110.20	-127.37	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
13,484.00	91.27	3.88	11,892.34	1,016.55 N	995.92 W	505,530.95	725,525.38	2.66	1,112.18	-127.37	
13,486.00	91.24	3.84	11,892.29	1,018.55 N	995.78 W	505,532.95	725,525.52	2.66	1,114.15	-127.37	
13,488.00	91.21	3.80	11,892.25	1,020.54 N	995.65 W	505,534.94	725,525.65	2.66	1,116.12	-127.37	
13,490.00	91.17	3.75	11,892.21	1,022.54 N	995.52 W	505,536.94	725,525.78	2.66	1,118.09	-127.37	
13,492.00	91.14	3.71	11,892.17	1,024.53 N	995.39 W	505,538.93	725,525.91	2.66	1,120.06	-127.37	
13,494.00	91.11	3.67	11,892.13	1,026.53 N	995.26 W	505,540.93	725,526.04	2.66	1,122.03	-127.37	
13,496.00	91.08	3.63	11,892.09	1,028.52 N	995.13 W	505,542.92	725,526.17	2.66	1,124.01	-127.37	
13,498.00	91.05	3.58	11,892.05	1,030.52 N	995.00 W	505,544.92	725,526.30	2.66	1,125.98	-127.37	
13,500.00	91.01	3.54	11,892.02	1,032.51 N	994.88 W	505,546.91	725,526.42	2.66	1,127.95	-127.37	
13,502.00	90.98	3.50	11,891.98	1,034.51 N	994.76 W	505,548.91	725,526.54	2.66	1,129.93	-127.37	
13,504.00	90.95	3.46	11,891.95	1,036.51 N	994.64 W	505,550.91	725,526.66	2.66	1,131.90	-127.37	
13,506.00	90.92	3.42	11,891.92	1,038.50 N	994.52 W	505,552.90	725,526.78	2.66	1,133.87	-127.38	
13,508.00	90.88	3.37	11,891.89	1,040.50 N	994.40 W	505,554.90	725,526.90	2.66	1,135.85	-127.38	
13,510.00	90.85	3.33	11,891.85	1,042.49 N	994.28 W	505,556.89	725,527.02	2.66	1,137.82	-127.38	
13,512.00	90.82	3.29	11,891.83	1,044.49 N	994.17 W	505,558.89	725,527.13	2.66	1,139.80	-127.38	
13,514.00	90.79	3.25	11,891.80	1,046.49 N	994.05 W	505,560.89	725,527.25	2.66	1,141.77	-127.38	
13,516.00	90.75	3.20	11,891.77	1,048.48 N	993.94 W	505,562.88	725,527.36	2.66	1,143.74	-127.38	
13,518.00	90.72	3.16	11,891.75	1,050.48 N	993.83 W	505,564.88	725,527.47	2.66	1,145.72	-127.38	
13,520.00	90.69	3.12	11,891.72	1,052.48 N	993.72 W	505,566.88	725,527.58	2.66	1,147.70	-127.38	
13,522.00	90.66	3.08	11,891.70	1,054.47 N	993.61 W	505,568.87	725,527.69	2.66	1,149.67	-127.38	
13,524.00	90.62	3.03	11,891.67	1,056.47 N	993.50 W	505,570.87	725,527.80	2.66	1,151.65	-127.38	
13,526.00	90.59	2.99	11,891.65	1,058.47 N	993.40 W	505,572.87	725,527.90	2.66	1,153.62	-127.38	
13,528.00	90.56	2.95	11,891.63	1,060.47 N	993.30 W	505,574.87	725,528.00	2.66	1,155.60	-127.38	
13,530.00	90.53	2.91	11,891.61	1,062.46 N	993.19 W	505,576.86	725,528.11	2.66	1,157.58	-127.38	
13,532.00	90.50	2.86	11,891.60	1,064.46 N	993.09 W	505,578.86	725,528.21	2.66	1,159.55	-127.38	
13,534.00	90.46	2.82	11,891.58	1,066.46 N	992.99 W	505,580.86	725,528.31	2.66	1,161.53	-127.38	
13,536.00	90.43	2.78	11,891.56	1,068.46 N	992.90 W	505,582.86	725,528.40	2.66	1,163.51	-127.38	
13,538.00	90.40	2.74	11,891.55	1,070.45 N	992.80 W	505,584.85	725,528.50	2.66	1,165.49	-127.38	
13,540.00	90.37	2.70	11,891.54	1,072.45 N	992.70 W	505,586.85	725,528.60	2.66	1,167.46	-127.38	
13,542.00	90.33	2.65	11,891.52	1,074.45 N	992.61 W	505,588.85	725,528.69	2.66	1,169.44	-127.38	
13,544.00	90.30	2.61	11,891.51	1,076.45 N	992.52 W	505,590.85	725,528.78	2.66	1,171.42	-127.38	
13,546.00	90.27	2.57	11,891.50	1,078.44 N	992.43 W	505,592.84	725,528.87	2.66	1,173.40	-127.38	
13,548.00	90.24	2.53	11,891.49	1,080.44 N	992.34 W	505,594.84	725,528.96	2.66	1,175.38	-127.38	
13,550.00	90.20	2.48	11,891.49	1,082.44 N	992.25 W	505,596.84	725,529.05	2.66	1,177.36	-127.38	
13,552.00	90.17	2.44	11,891.48	1,084.44 N	992.17 W	505,598.84	725,529.13	2.66	1,179.34	-127.39	
13,554.00	90.14	2.40	11,891.47	1,086.44 N	992.08 W	505,600.84	725,529.22	2.66	1,181.31	-127.39	
13,556.00	90.11	2.36	11,891.47	1,088.44 N	992.00 W	505,602.84	725,529.30	2.66	1,183.29	-127.39	



Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
13,558.00	90.07	2.31	11,891.47	1,090.43 N	991.92 W	505,604.83	725,529.38	2.66	1,185.27	-127.39	
13,560.00	90.04	2.27	11,891.47	1,092.43 N	991.84 W	505,606.83	725,529.46	2.66	1,187.25	-127.39	
13,562.00	90.01	2.23	11,891.46	1,094.43 N	991.76 W	505,608.83	725,529.54	2.66	1,189.23	-127.39	
13,564.00	90.01	2.20	11,891.46	1,096.43 N	991.68 W	505,610.83	725,529.62	1.28	1,191.21	-84.81	
13,566.00	90.01	2.18	11,891.46	1,098.43 N	991.61 W	505,612.83	725,529.69	1.28	1,193.20	-84.81	
13,568.00	90.02	2.15	11,891.46	1,100.43 N	991.53 W	505,614.83	725,529.77	1.28	1,195.18	-84.81	
13,570.00	90.02	2.13	11,891.46	1,102.42 N	991.45 W	505,616.82	725,529.85	1.28	1,197.16	-84.81	
13,572.00	90.02	2.10	11,891.46	1,104.42 N	991.38 W	505,618.82	725,529.92	1.28	1,199.14	-84.81	
13,574.00	90.02	2.08	11,891.46	1,106.42 N	991.31 W	505,620.82	725,529.99	1.28	1,201.12	-84.81	
13,576.00	90.03	2.05	11,891.46	1,108.42 N	991.24 W	505,622.82	725,530.06	1.28	1,203.10	-84.81	
13,578.00	90.03	2.03	11,891.46	1,110.42 N	991.16 W	505,624.82	725,530.14	1.28	1,205.08	-84.81	
13,580.00	90.03	2.00	11,891.46	1,112.42 N	991.09 W	505,626.82	725,530.21	1.28	1,207.06	-84.81	
13,582.00	90.03	1.98	11,891.46	1,114.42 N	991.03 W	505,628.82	725,530.27	1.28	1,209.04	-84.81	
13,584.00	90.04	1.95	11,891.46	1,116.42 N	990.96 W	505,630.82	725,530.34	1.28	1,211.03	-84.81	
13,586.00	90.04	1.92	11,891.45	1,118.41 N	990.89 W	505,632.81	725,530.41	1.28	1,213.01	-84.81	
13,588.00	90.04	1.90	11,891.45	1,120.41 N	990.82 W	505,634.81	725,530.48	1.28	1,214.99	-84.81	
13,590.00	90.04	1.87	11,891.45	1,122.41 N	990.76 W	505,636.81	725,530.54	1.28	1,216.97	-84.81	
13,592.00	90.04	1.85	11,891.45	1,124.41 N	990.69 W	505,638.81	725,530.61	1.28	1,218.95	-84.81	
13,594.00	90.05	1.82	11,891.45	1,126.41 N	990.63 W	505,640.81	725,530.67	1.28	1,220.94	-84.81	
13,596.00	90.05	1.80	11,891.45	1,128.41 N	990.56 W	505,642.81	725,530.74	1.28	1,222.92	-84.81	
13,598.00	90.05	1.77	11,891.44	1,130.41 N	990.50 W	505,644.81	725,530.80	1.28	1,224.90	-84.81	
13,600.00	90.05	1.75	11,891.44	1,132.41 N	990.44 W	505,646.81	725,530.86	1.28	1,226.88	-84.81	
13,602.00	90.06	1.72	11,891.44	1,134.41 N	990.38 W	505,648.81	725,530.92	1.28	1,228.87	-84.81	
13,604.00	90.06	1.70	11,891.44	1,136.41 N	990.32 W	505,650.81	725,530.98	1.28	1,230.85	-84.81	
13,606.00	90.06	1.67	11,891.44	1,138.40 N	990.26 W	505,652.80	725,531.04	1.28	1,232.83	-84.81	
13,608.00	90.06	1.64	11,891.43	1,140.40 N	990.20 W	505,654.80	725,531.10	1.28	1,234.81	-84.81	
13,610.00	90.07	1.62	11,891.43	1,142.40 N	990.15 W	505,656.80	725,531.15	1.28	1,236.80	-84.81	
13,612.00	90.07	1.59	11,891.43	1,144.40 N	990.09 W	505,658.80	725,531.21	1.28	1,238.78	-84.81	
13,614.00	90.07	1.57	11,891.43	1,146.40 N	990.04 W	505,660.80	725,531.26	1.28	1,240.76	-84.81	
13,616.00	90.07	1.54	11,891.43	1,148.40 N	989.98 W	505,662.80	725,531.32	1.28	1,242.75	-84.81	
13,618.00	90.07	1.52	11,891.42	1,150.40 N	989.93 W	505,664.80	725,531.37	1.28	1,244.73	-84.81	
13,620.00	90.08	1.49	11,891.42	1,152.40 N	989.88 W	505,666.80	725,531.42	1.28	1,246.71	-84.81	
13,622.00	90.08	1.47	11,891.42	1,154.40 N	989.82 W	505,668.80	725,531.48	1.28	1,248.70	-84.81	
13,624.00	90.08	1.44	11,891.41	1,156.40 N	989.77 W	505,670.80	725,531.53	1.28	1,250.68	-84.81	
13,626.00	90.08	1.41	11,891.41	1,158.40 N	989.72 W	505,672.80	725,531.58	1.28	1,252.67	-84.81	
13,628.00	90.09	1.39	11,891.41	1,160.40 N	989.67 W	505,674.80	725,531.63	1.28	1,254.65	-84.81	
13,630.00	90.09	1.36	11,891.41	1,162.40 N	989.63 W	505,676.80	725,531.67	1.28	1,256.63	-84.81	

HALLIBURTON

Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
13,632.00	90.09	1.34	11,891.40	1,164.40 N	989.58 W	505,678.80	725,531.72	1.28	1,258.62	-84.81	
13,634.00	90.09	1.31	11,891.40	1,166.40 N	989.53 W	505,680.80	725,531.77	1.28	1,260.60	-84.81	
13,636.00	90.10	1.29	11,891.40	1,168.39 N	989.49 W	505,682.79	725,531.81	1.28	1,262.59	-84.81	
13,638.00	90.10	1.26	11,891.39	1,170.39 N	989.44 W	505,684.79	725,531.86	1.28	1,264.57	-84.81	
13,640.00	90.10	1.24	11,891.39	1,172.39 N	989.40 W	505,686.79	725,531.90	1.28	1,266.56	-84.81	
13,642.00	90.10	1.21	11,891.39	1,174.39 N	989.36 W	505,688.79	725,531.94	1.28	1,268.54	-84.81	
13,644.00	90.10	1.19	11,891.38	1,176.39 N	989.32 W	505,690.79	725,531.98	1.28	1,270.53	-84.81	
13,646.00	90.11	1.16	11,891.38	1,178.39 N	989.27 W	505,692.79	725,532.03	1.28	1,272.51	-84.81	
13,648.00	90.11	1.13	11,891.37	1,180.39 N	989.23 W	505,694.79	725,532.07	1.28	1,274.50	-84.81	
13,650.00	90.11	1.11	11,891.37	1,182.39 N	989.20 W	505,696.79	725,532.10	1.28	1,276.48	-84.81	
13,652.00	90.11	1.08	11,891.37	1,184.39 N	989.16 W	505,698.79	725,532.14	1.28	1,278.47	-84.81	
13,654.00	90.12	1.06	11,891.36	1,186.39 N	989.12 W	505,700.79	725,532.18	1.28	1,280.45	-84.81	
13,656.00	90.12	1.03	11,891.36	1,188.39 N	989.08 W	505,702.79	725,532.22	1.28	1,282.44	-84.81	
13,658.00	90.12	1.02	11,891.35	1,190.39 N	989.05 W	505,704.79	725,532.25	0.64	1,284.43	-84.81	
13,660.00	90.12	1.03	11,891.35	1,192.39 N	989.01 W	505,706.79	725,532.29	0.61	1,286.41	101.89	
13,662.00	90.12	1.04	11,891.35	1,194.39 N	988.98 W	505,708.79	725,532.32	0.41	1,288.40	101.89	
13,664.00	90.11	1.05	11,891.34	1,196.39 N	988.94 W	505,710.79	725,532.36	0.41	1,290.38	101.89	
13,666.00	90.11	1.06	11,891.34	1,198.39 N	988.90 W	505,712.79	725,532.40	0.41	1,292.37	101.89	
13,668.00	90.11	1.06	11,891.33	1,200.39 N	988.87 W	505,714.79	725,532.43	0.41	1,294.35	101.89	
13,670.00	90.11	1.07	11,891.33	1,202.39 N	988.83 W	505,716.79	725,532.47	0.41	1,296.34	101.89	
13,672.00	90.11	1.08	11,891.33	1,204.39 N	988.79 W	505,718.79	725,532.51	0.41	1,298.33	101.89	
13,674.00	90.11	1.09	11,891.32	1,206.39 N	988.75 W	505,720.79	725,532.55	0.41	1,300.31	101.89	
13,676.00	90.10	1.10	11,891.32	1,208.39 N	988.71 W	505,722.79	725,532.59	0.41	1,302.30	101.89	
13,678.00	90.10	1.10	11,891.32	1,210.39 N	988.68 W	505,724.79	725,532.62	0.41	1,304.28	101.89	
13,680.00	90.10	1.11	11,891.31	1,212.39 N	988.64 W	505,726.79	725,532.66	0.41	1,306.27	101.89	
13,682.00	90.10	1.12	11,891.31	1,214.39 N	988.60 W	505,728.79	725,532.70	0.41	1,308.25	101.89	
13,684.00	90.10	1.13	11,891.31	1,216.39 N	988.56 W	505,730.79	725,532.74	0.41	1,310.24	101.89	
13,686.00	90.10	1.14	11,891.30	1,218.39 N	988.52 W	505,732.79	725,532.78	0.41	1,312.22	101.89	
13,688.00	90.09	1.14	11,891.30	1,220.38 N	988.48 W	505,734.78	725,532.82	0.41	1,314.21	101.89	
13,690.00	90.09	1.15	11,891.30	1,222.38 N	988.44 W	505,736.78	725,532.86	0.41	1,316.19	101.89	
13,692.00	90.09	1.16	11,891.29	1,224.38 N	988.40 W	505,738.78	725,532.90	0.41	1,318.18	101.89	
13,694.00	90.09	1.17	11,891.29	1,226.38 N	988.36 W	505,740.78	725,532.94	0.41	1,320.16	101.89	
13,696.00	90.09	1.18	11,891.29	1,228.38 N	988.32 W	505,742.78	725,532.98	0.41	1,322.15	101.89	
13,698.00	90.09	1.18	11,891.28	1,230.38 N	988.28 W	505,744.78	725,533.02	0.41	1,324.13	101.89	
13,700.00	90.08	1.19	11,891.28	1,232.38 N	988.24 W	505,746.78	725,533.06	0.41	1,326.12	101.89	
13,702.00	90.08	1.20	11,891.28	1,234.38 N	988.19 W	505,748.78	725,533.11	0.41	1,328.11	101.89	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
13,704.00	90.08	1.21	11,891.27	1,236.38 N	988.15 W	505,750.78	725,533.15	0.41	1,330.09	101.89	
13,706.00	90.08	1.22	11,891.27	1,238.38 N	988.11 W	505,752.78	725,533.19	0.41	1,332.08	101.89	
13,708.00	90.08	1.22	11,891.27	1,240.38 N	988.07 W	505,754.78	725,533.23	0.41	1,334.06	101.89	
13,710.00	90.08	1.23	11,891.27	1,242.38 N	988.02 W	505,756.78	725,533.28	0.41	1,336.05	101.89	
13,712.00	90.07	1.24	11,891.26	1,244.38 N	987.98 W	505,758.78	725,533.32	0.41	1,338.03	101.89	
13,714.00	90.07	1.25	11,891.26	1,246.38 N	987.94 W	505,760.78	725,533.36	0.41	1,340.01	101.89	
13,716.00	90.07	1.26	11,891.26	1,248.38 N	987.89 W	505,762.78	725,533.41	0.41	1,342.00	101.89	
13,718.00	90.07	1.26	11,891.26	1,250.38 N	987.85 W	505,764.78	725,533.45	0.41	1,343.98	101.89	
13,720.00	90.07	1.27	11,891.25	1,252.38 N	987.81 W	505,766.78	725,533.49	0.41	1,345.97	101.89	
13,722.00	90.07	1.28	11,891.25	1,254.38 N	987.76 W	505,768.78	725,533.54	0.41	1,347.95	101.89	
13,724.00	90.06	1.29	11,891.25	1,256.38 N	987.72 W	505,770.78	725,533.58	0.41	1,349.94	101.89	
13,726.00	90.06	1.30	11,891.25	1,258.38 N	987.67 W	505,772.78	725,533.63	0.41	1,351.92	101.89	
13,728.00	90.06	1.30	11,891.24	1,260.38 N	987.63 W	505,774.78	725,533.67	0.41	1,353.91	101.89	
13,730.00	90.06	1.31	11,891.24	1,262.37 N	987.58 W	505,776.77	725,533.72	0.41	1,355.89	101.89	
13,732.00	90.06	1.32	11,891.24	1,264.37 N	987.53 W	505,778.77	725,533.77	0.41	1,357.88	101.89	
13,734.00	90.06	1.33	11,891.24	1,266.37 N	987.49 W	505,780.77	725,533.81	0.41	1,359.86	101.89	
13,736.00	90.05	1.34	11,891.24	1,268.37 N	987.44 W	505,782.77	725,533.86	0.41	1,361.85	101.89	
13,738.00	90.05	1.34	11,891.24	1,270.37 N	987.39 W	505,784.77	725,533.91	0.41	1,363.83	101.89	
13,740.00	90.05	1.35	11,891.23	1,272.37 N	987.35 W	505,786.77	725,533.95	0.41	1,365.81	101.89	
13,742.00	90.05	1.36	11,891.23	1,274.37 N	987.30 W	505,788.77	725,534.00	0.41	1,367.80	101.89	
13,744.00	90.05	1.37	11,891.23	1,276.37 N	987.25 W	505,790.77	725,534.05	0.41	1,369.78	101.89	
13,746.00	90.05	1.38	11,891.23	1,278.37 N	987.20 W	505,792.77	725,534.10	0.41	1,371.77	101.89	
13,748.00	90.04	1.38	11,891.23	1,280.37 N	987.16 W	505,794.77	725,534.14	0.41	1,373.75	101.89	
13,750.00	90.04	1.39	11,891.23	1,282.37 N	987.11 W	505,796.77	725,534.19	0.41	1,375.74	101.89	
13,752.00	90.04	1.40	11,891.22	1,284.37 N	987.06 W	505,798.77	725,534.24	0.41	1,377.72	101.89	
13,754.00	90.05	1.42	11,891.22	1,286.37 N	987.01 W	505,800.77	725,534.29	0.95	1,379.70	71.77	
13,756.00	90.05	1.44	11,891.22	1,288.37 N	986.96 W	505,802.77	725,534.34	0.95	1,381.69	71.77	
13,758.00	90.06	1.45	11,891.22	1,290.37 N	986.91 W	505,804.77	725,534.39	0.95	1,383.67	71.77	
13,760.00	90.06	1.47	11,891.22	1,292.37 N	986.86 W	505,806.77	725,534.44	0.95	1,385.66	71.77	
13,762.00	90.07	1.49	11,891.21	1,294.37 N	986.81 W	505,808.77	725,534.49	0.95	1,387.64	71.77	
13,764.00	90.08	1.51	11,891.21	1,296.36 N	986.75 W	505,810.76	725,534.55	0.95	1,389.62	71.77	
13,766.00	90.08	1.53	11,891.21	1,298.36 N	986.70 W	505,812.76	725,534.60	0.95	1,391.61	71.77	
13,768.00	90.09	1.54	11,891.21	1,300.36 N	986.65 W	505,814.76	725,534.65	0.95	1,393.59	71.77	
13,770.00	90.09	1.56	11,891.20	1,302.36 N	986.59 W	505,816.76	725,534.71	0.95	1,395.57	71.77	
13,772.00	90.10	1.58	11,891.20	1,304.36 N	986.54 W	505,818.76	725,534.76	0.95	1,397.56	71.77	
13,774.00	90.11	1.60	11,891.20	1,306.36 N	986.48 W	505,820.76	725,534.82	0.95	1,399.54	71.77	
13,776.00	90.11	1.62	11,891.19	1,308.36 N	986.43 W	505,822.76	725,534.87	0.95	1,401.52	71.77	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates (usft)		Map Coordinates (usft)		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing	Easting	Northing	Easting				
13,778.00	90.12	1.64	11,891.19	1,310.36 N	986.37 W	505,824.76	725,534.93	0.95	1,403.51	71.77	
13,780.00	90.12	1.65	11,891.18	1,312.36 N	986.31 W	505,826.76	725,534.99	0.95	1,405.49	71.77	
13,782.00	90.13	1.67	11,891.18	1,314.36 N	986.26 W	505,828.76	725,535.04	0.95	1,407.47	71.77	
13,784.00	90.14	1.69	11,891.17	1,316.36 N	986.20 W	505,830.76	725,535.10	0.95	1,409.46	71.77	
13,786.00	90.14	1.71	11,891.17	1,318.36 N	986.14 W	505,832.76	725,535.16	0.95	1,411.44	71.77	
13,788.00	90.15	1.73	11,891.17	1,320.36 N	986.08 W	505,834.76	725,535.22	0.95	1,413.42	71.77	
13,790.00	90.15	1.74	11,891.16	1,322.35 N	986.02 W	505,836.75	725,535.28	0.95	1,415.41	71.77	
13,792.00	90.16	1.76	11,891.15	1,324.35 N	985.96 W	505,838.75	725,535.34	0.95	1,417.39	71.77	
13,794.00	90.17	1.78	11,891.15	1,326.35 N	985.89 W	505,840.75	725,535.41	0.95	1,419.37	71.77	
13,796.00	90.17	1.80	11,891.14	1,328.35 N	985.83 W	505,842.75	725,535.47	0.95	1,421.35	71.77	
13,798.00	90.18	1.82	11,891.14	1,330.35 N	985.77 W	505,844.75	725,535.53	0.95	1,423.33	71.77	
13,800.00	90.18	1.83	11,891.13	1,332.35 N	985.70 W	505,846.75	725,535.60	0.95	1,425.32	71.77	
13,802.00	90.19	1.85	11,891.12	1,334.35 N	985.64 W	505,848.75	725,535.66	0.95	1,427.30	71.77	
13,804.00	90.19	1.87	11,891.12	1,336.35 N	985.58 W	505,850.75	725,535.72	0.95	1,429.28	71.77	
13,806.00	90.20	1.89	11,891.11	1,338.35 N	985.51 W	505,852.75	725,535.79	0.95	1,431.26	71.77	
13,808.00	90.21	1.91	11,891.10	1,340.35 N	985.44 W	505,854.75	725,535.86	0.95	1,433.25	71.77	
13,810.00	90.21	1.92	11,891.10	1,342.34 N	985.38 W	505,856.74	725,535.92	0.95	1,435.23	71.77	
13,812.00	90.22	1.94	11,891.09	1,344.34 N	985.31 W	505,858.74	725,535.99	0.95	1,437.21	71.77	
13,814.00	90.22	1.96	11,891.08	1,346.34 N	985.24 W	505,860.74	725,536.06	0.95	1,439.19	71.77	
13,816.00	90.23	1.98	11,891.07	1,348.34 N	985.17 W	505,862.74	725,536.13	0.95	1,441.17	71.77	
13,818.00	90.24	2.00	11,891.06	1,350.34 N	985.10 W	505,864.74	725,536.20	0.95	1,443.15	71.77	
13,820.00	90.24	2.01	11,891.06	1,352.34 N	985.03 W	505,866.74	725,536.27	0.95	1,445.14	71.77	
13,822.00	90.25	2.03	11,891.05	1,354.34 N	984.96 W	505,868.74	725,536.34	0.95	1,447.12	71.77	
13,824.00	90.25	2.05	11,891.04	1,356.34 N	984.89 W	505,870.74	725,536.41	0.95	1,449.10	71.77	
13,826.00	90.26	2.07	11,891.03	1,358.33 N	984.82 W	505,872.73	725,536.48	0.95	1,451.08	71.77	
13,828.00	90.27	2.09	11,891.02	1,360.33 N	984.75 W	505,874.73	725,536.55	0.95	1,453.06	71.77	
13,830.00	90.27	2.11	11,891.01	1,362.33 N	984.67 W	505,876.73	725,536.63	0.95	1,455.04	71.77	
13,832.00	90.28	2.12	11,891.00	1,364.33 N	984.60 W	505,878.73	725,536.70	0.95	1,457.02	71.77	
13,834.00	90.28	2.14	11,890.99	1,366.33 N	984.53 W	505,880.73	725,536.77	0.95	1,459.00	71.77	
13,836.00	90.29	2.16	11,890.98	1,368.33 N	984.45 W	505,882.73	725,536.85	0.95	1,460.98	71.77	
13,838.00	90.30	2.18	11,890.97	1,370.33 N	984.37 W	505,884.73	725,536.93	0.95	1,462.96	71.77	
13,840.00	90.30	2.20	11,890.96	1,372.32 N	984.30 W	505,886.72	725,537.00	0.95	1,464.94	71.77	
13,842.00	90.31	2.21	11,890.95	1,374.32 N	984.22 W	505,888.72	725,537.08	0.95	1,466.92	71.77	
13,844.00	90.31	2.23	11,890.94	1,376.32 N	984.14 W	505,890.72	725,537.16	0.95	1,468.90	71.77	
13,846.00	90.32	2.25	11,890.93	1,378.32 N	984.07 W	505,892.72	725,537.23	0.95	1,470.89	71.77	
13,848.00	90.31	2.32	11,890.92	1,380.32 N	983.99 W	505,894.72	725,537.31	3.69	1,472.87	97.36	
13,850.00	90.30	2.40	11,890.91	1,382.32 N	983.90 W	505,896.72	725,537.40	3.69	1,474.84	97.36	



Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
13,852.00	90.29	2.47	11,890.90	1,384.31 N	983.82 W	505,898.71	725,537.48	3.69	1,476.82	97.36	
13,854.00	90.28	2.54	11,890.89	1,386.31 N	983.73 W	505,900.71	725,537.57	3.69	1,478.80	97.36	
13,856.00	90.27	2.62	11,890.88	1,388.31 N	983.64 W	505,902.71	725,537.66	3.69	1,480.78	97.36	
13,858.00	90.26	2.69	11,890.87	1,390.31 N	983.55 W	505,904.71	725,537.75	3.69	1,482.76	97.36	
13,860.00	90.25	2.76	11,890.86	1,392.31 N	983.45 W	505,906.71	725,537.85	3.69	1,484.74	97.37	
13,862.00	90.24	2.84	11,890.85	1,394.30 N	983.36 W	505,908.70	725,537.94	3.69	1,486.72	97.37	
13,864.00	90.23	2.91	11,890.84	1,396.30 N	983.26 W	505,910.70	725,538.04	3.69	1,488.69	97.37	
13,866.00	90.23	2.98	11,890.83	1,398.30 N	983.15 W	505,912.70	725,538.15	3.69	1,490.67	97.37	
13,868.00	90.22	3.06	11,890.83	1,400.30 N	983.05 W	505,914.70	725,538.25	3.69	1,492.65	97.37	
13,870.00	90.21	3.13	11,890.82	1,402.29 N	982.94 W	505,916.69	725,538.36	3.69	1,494.62	97.37	
13,872.00	90.20	3.20	11,890.81	1,404.29 N	982.83 W	505,918.69	725,538.47	3.69	1,496.60	97.37	
13,874.00	90.19	3.28	11,890.80	1,406.29 N	982.72 W	505,920.69	725,538.58	3.69	1,498.57	97.37	
13,876.00	90.18	3.35	11,890.80	1,408.28 N	982.60 W	505,922.68	725,538.70	3.69	1,500.55	97.37	
13,878.00	90.17	3.42	11,890.79	1,410.28 N	982.48 W	505,924.68	725,538.82	3.69	1,502.52	97.37	
13,880.00	90.16	3.50	11,890.79	1,412.28 N	982.36 W	505,926.68	725,538.94	3.69	1,504.49	97.37	
13,882.00	90.15	3.57	11,890.78	1,414.27 N	982.24 W	505,928.67	725,539.06	3.69	1,506.47	97.37	
13,884.00	90.14	3.64	11,890.78	1,416.27 N	982.11 W	505,930.67	725,539.19	3.69	1,508.44	97.37	
13,886.00	90.13	3.72	11,890.77	1,418.26 N	981.98 W	505,932.66	725,539.32	3.69	1,510.41	97.37	
13,888.00	90.12	3.79	11,890.77	1,420.26 N	981.85 W	505,934.66	725,539.45	3.69	1,512.39	97.37	
13,890.00	90.11	3.86	11,890.76	1,422.26 N	981.72 W	505,936.66	725,539.58	3.69	1,514.36	97.37	
13,892.00	90.10	3.94	11,890.76	1,424.25 N	981.58 W	505,938.65	725,539.72	3.69	1,516.33	97.37	
13,894.00	90.09	4.01	11,890.76	1,426.25 N	981.45 W	505,940.65	725,539.85	3.69	1,518.30	97.37	
13,896.00	90.08	4.08	11,890.75	1,428.24 N	981.30 W	505,942.64	725,540.00	3.69	1,520.27	97.37	
13,898.00	90.07	4.15	11,890.75	1,430.24 N	981.16 W	505,944.64	725,540.14	3.69	1,522.24	97.37	
13,900.00	90.06	4.23	11,890.75	1,432.23 N	981.01 W	505,946.63	725,540.29	3.69	1,524.21	97.37	
13,902.00	90.05	4.30	11,890.75	1,434.22 N	980.87 W	505,948.62	725,540.43	3.69	1,526.18	97.37	
13,904.00	90.05	4.37	11,890.74	1,436.22 N	980.71 W	505,950.62	725,540.59	3.69	1,528.15	97.37	
13,906.00	90.04	4.45	11,890.74	1,438.21 N	980.56 W	505,952.61	725,540.74	3.69	1,530.12	97.37	
13,908.00	90.03	4.52	11,890.74	1,440.21 N	980.40 W	505,954.61	725,540.90	3.69	1,532.08	97.37	
13,910.00	90.02	4.59	11,890.74	1,442.20 N	980.25 W	505,956.60	725,541.05	3.69	1,534.05	97.37	
13,912.00	90.01	4.67	11,890.74	1,444.19 N	980.08 W	505,958.59	725,541.22	3.69	1,536.02	97.37	
13,914.00	90.00	4.74	11,890.74	1,446.19 N	979.92 W	505,960.59	725,541.38	3.69	1,537.98	97.37	
13,916.00	89.99	4.81	11,890.74	1,448.18 N	979.75 W	505,962.58	725,541.55	3.69	1,539.95	97.37	
13,918.00	89.98	4.89	11,890.74	1,450.17 N	979.58 W	505,964.57	725,541.72	3.69	1,541.92	97.37	
13,920.00	89.97	4.96	11,890.74	1,452.17 N	979.41 W	505,966.57	725,541.89	3.69	1,543.88	97.37	
13,922.00	89.96	5.03	11,890.74	1,454.16 N	979.24 W	505,968.56	725,542.06	3.69	1,545.85	97.37	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates (usft)		Map Coordinates (usft)		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing	Easting	Northing	Easting				
13,924.00	89.95	5.11	11,890.74	1,456.15 N	979.06 W	505,970.55	725,542.24	3.69	1,547.81	97.37	
13,926.00	89.94	5.18	11,890.75	1,458.14 N	978.88 W	505,972.54	725,542.42	3.69	1,549.77	97.37	
13,928.00	89.93	5.25	11,890.75	1,460.13 N	978.70 W	505,974.53	725,542.60	3.69	1,551.74	97.37	
13,930.00	89.92	5.33	11,890.75	1,462.13 N	978.52 W	505,976.53	725,542.78	3.69	1,553.70	97.37	
13,932.00	89.91	5.40	11,890.75	1,464.12 N	978.33 W	505,978.52	725,542.97	3.69	1,555.66	97.37	
13,934.00	89.90	5.47	11,890.76	1,466.11 N	978.14 W	505,980.51	725,543.16	3.69	1,557.62	97.37	
13,936.00	89.89	5.55	11,890.76	1,468.10 N	977.95 W	505,982.50	725,543.35	3.69	1,559.58	97.37	
13,938.00	89.88	5.62	11,890.76	1,470.09 N	977.75 W	505,984.49	725,543.55	3.69	1,561.54	97.37	
13,940.00	89.87	5.69	11,890.77	1,472.08 N	977.56 W	505,986.48	725,543.74	3.69	1,563.50	97.37	
13,942.00	89.88	5.68	11,890.77	1,474.07 N	977.36 W	505,988.47	725,543.94	0.54	1,565.46	-83.22	
13,944.00	89.89	5.59	11,890.78	1,476.06 N	977.16 W	505,990.46	725,544.14	4.76	1,567.42	-82.76	
13,946.00	89.90	5.49	11,890.78	1,478.05 N	976.97 W	505,992.45	725,544.33	4.76	1,569.38	-82.76	
13,948.00	89.91	5.40	11,890.78	1,480.04 N	976.78 W	505,994.44	725,544.52	4.76	1,571.35	-82.76	
13,950.00	89.92	5.30	11,890.79	1,482.03 N	976.59 W	505,996.43	725,544.71	4.76	1,573.31	-82.76	
13,952.00	89.94	5.21	11,890.79	1,484.02 N	976.41 W	505,998.42	725,544.89	4.76	1,575.27	-82.76	
13,954.00	89.95	5.12	11,890.79	1,486.02 N	976.23 W	506,000.42	725,545.07	4.76	1,577.23	-82.76	
13,956.00	89.96	5.02	11,890.79	1,488.01 N	976.05 W	506,002.41	725,545.25	4.76	1,579.20	-82.76	
13,958.00	89.97	4.93	11,890.79	1,490.00 N	975.88 W	506,004.40	725,545.42	4.76	1,581.16	-82.76	
13,960.00	89.98	4.83	11,890.80	1,491.99 N	975.71 W	506,006.39	725,545.59	4.76	1,583.13	-82.76	
13,962.00	90.00	4.74	11,890.80	1,493.99 N	975.54 W	506,008.39	725,545.76	4.76	1,585.09	-82.76	
13,964.00	90.01	4.64	11,890.80	1,495.98 N	975.38 W	506,010.38	725,545.92	4.76	1,587.06	-82.76	
13,966.00	90.02	4.55	11,890.79	1,497.97 N	975.22 W	506,012.37	725,546.08	4.76	1,589.03	-82.76	
13,968.00	90.03	4.45	11,890.79	1,499.97 N	975.06 W	506,014.37	725,546.24	4.76	1,591.00	-82.76	
13,970.00	90.04	4.36	11,890.79	1,501.96 N	974.91 W	506,016.36	725,546.39	4.76	1,592.96	-82.76	
13,972.00	90.06	4.26	11,890.79	1,503.96 N	974.76 W	506,018.36	725,546.54	4.76	1,594.93	-82.76	
13,974.00	90.07	4.17	11,890.79	1,505.95 N	974.61 W	506,020.35	725,546.69	4.76	1,596.90	-82.76	
13,976.00	90.08	4.08	11,890.79	1,507.95 N	974.46 W	506,022.35	725,546.84	4.76	1,598.87	-82.76	
13,978.00	90.09	3.98	11,890.78	1,509.94 N	974.32 W	506,024.34	725,546.98	4.76	1,600.84	-82.76	
13,980.00	90.10	3.89	11,890.78	1,511.94 N	974.19 W	506,026.34	725,547.11	4.76	1,602.81	-82.76	
13,982.00	90.12	3.79	11,890.78	1,513.93 N	974.05 W	506,028.33	725,547.25	4.76	1,604.79	-82.76	
13,984.00	90.13	3.70	11,890.77	1,515.93 N	973.92 W	506,030.33	725,547.38	4.76	1,606.76	-82.76	
13,986.00	90.14	3.60	11,890.77	1,517.92 N	973.80 W	506,032.32	725,547.50	4.76	1,608.73	-82.76	
13,988.00	90.15	3.51	11,890.76	1,519.92 N	973.67 W	506,034.32	725,547.63	4.76	1,610.70	-82.76	
13,990.00	90.16	3.41	11,890.76	1,521.92 N	973.55 W	506,036.32	725,547.75	4.76	1,612.68	-82.76	
13,992.00	90.18	3.32	11,890.75	1,523.91 N	973.43 W	506,038.31	725,547.87	4.76	1,614.65	-82.76	
13,994.00	90.19	3.23	11,890.74	1,525.91 N	973.32 W	506,040.31	725,547.98	4.76	1,616.63	-82.76	
13,996.00	90.20	3.13	11,890.74	1,527.91 N	973.21 W	506,042.31	725,548.09	4.76	1,618.60	-82.76	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
13,998.00	90.21	3.04	11,890.73	1,529.90 N	973.10 W	506,044.30	725,548.20	4.76	1,620.58	-82.76	
14,000.00	90.22	2.94	11,890.72	1,531.90 N	973.00 W	506,046.30	725,548.30	4.76	1,622.55	-82.76	
14,002.00	90.24	2.85	11,890.71	1,533.90 N	972.90 W	506,048.30	725,548.40	4.76	1,624.53	-82.76	
14,004.00	90.25	2.75	11,890.71	1,535.89 N	972.80 W	506,050.29	725,548.50	4.76	1,626.51	-82.77	
14,006.00	90.26	2.66	11,890.70	1,537.89 N	972.70 W	506,052.29	725,548.60	4.76	1,628.49	-82.77	
14,008.00	90.27	2.56	11,890.69	1,539.89 N	972.61 W	506,054.29	725,548.69	4.76	1,630.47	-82.77	
14,010.00	90.28	2.47	11,890.68	1,541.89 N	972.52 W	506,056.29	725,548.78	4.76	1,632.44	-82.77	
14,012.00	90.30	2.37	11,890.67	1,543.89 N	972.44 W	506,058.29	725,548.86	4.76	1,634.42	-82.77	
14,014.00	90.31	2.28	11,890.66	1,545.88 N	972.36 W	506,060.28	725,548.94	4.76	1,636.40	-82.77	
14,016.00	90.32	2.19	11,890.65	1,547.88 N	972.28 W	506,062.28	725,549.02	4.76	1,638.38	-82.77	
14,018.00	90.33	2.09	11,890.64	1,549.88 N	972.21 W	506,064.28	725,549.09	4.76	1,640.36	-82.77	
14,020.00	90.34	2.00	11,890.62	1,551.88 N	972.13 W	506,066.28	725,549.17	4.76	1,642.35	-82.77	
14,022.00	90.36	1.90	11,890.61	1,553.88 N	972.07 W	506,068.28	725,549.23	4.76	1,644.33	-82.77	
14,024.00	90.37	1.81	11,890.60	1,555.88 N	972.00 W	506,070.28	725,549.30	4.76	1,646.31	-82.77	
14,026.00	90.38	1.71	11,890.59	1,557.88 N	971.94 W	506,072.28	725,549.36	4.76	1,648.29	-82.77	
14,028.00	90.39	1.62	11,890.57	1,559.88 N	971.88 W	506,074.28	725,549.42	4.76	1,650.28	-82.77	
14,030.00	90.40	1.52	11,890.56	1,561.88 N	971.83 W	506,076.28	725,549.47	4.76	1,652.26	-82.77	
14,032.00	90.42	1.43	11,890.54	1,563.88 N	971.78 W	506,078.28	725,549.52	4.76	1,654.24	-82.77	
14,034.00	90.43	1.33	11,890.53	1,565.87 N	971.73 W	506,080.27	725,549.57	4.76	1,656.23	-82.77	
14,036.00	90.44	1.24	11,890.51	1,567.87 N	971.68 W	506,082.27	725,549.62	4.76	1,658.21	-82.77	
14,038.00	90.46	1.21	11,890.50	1,569.87 N	971.64 W	506,084.27	725,549.66	1.77	1,660.20	-61.27	
14,040.00	90.47	1.18	11,890.48	1,571.87 N	971.60 W	506,086.27	725,549.70	1.77	1,662.18	-61.27	
14,042.00	90.49	1.15	11,890.47	1,573.87 N	971.56 W	506,088.27	725,549.74	1.77	1,664.17	-61.27	
14,044.00	90.51	1.12	11,890.45	1,575.87 N	971.52 W	506,090.27	725,549.78	1.77	1,666.15	-61.27	
14,046.00	90.53	1.08	11,890.43	1,577.87 N	971.48 W	506,092.27	725,549.82	1.77	1,668.14	-61.27	
14,048.00	90.54	1.05	11,890.41	1,579.87 N	971.44 W	506,094.27	725,549.86	1.77	1,670.12	-61.27	
14,050.00	90.56	1.02	11,890.39	1,581.87 N	971.41 W	506,096.27	725,549.89	1.77	1,672.11	-61.27	
14,052.00	90.58	0.99	11,890.37	1,583.87 N	971.37 W	506,098.27	725,549.93	1.77	1,674.09	-61.27	
14,054.00	90.59	0.96	11,890.35	1,585.87 N	971.34 W	506,100.27	725,549.96	1.77	1,676.08	-61.27	
14,056.00	90.61	0.93	11,890.33	1,587.87 N	971.30 W	506,102.27	725,550.00	1.77	1,678.07	-61.27	
14,058.00	90.63	0.90	11,890.31	1,589.87 N	971.27 W	506,104.27	725,550.03	1.77	1,680.05	-61.27	
14,060.00	90.64	0.87	11,890.29	1,591.87 N	971.24 W	506,106.27	725,550.06	1.77	1,682.04	-61.27	
14,062.00	90.66	0.84	11,890.26	1,593.87 N	971.21 W	506,108.27	725,550.09	1.77	1,684.02	-61.27	
14,064.00	90.68	0.81	11,890.24	1,595.87 N	971.18 W	506,110.27	725,550.12	1.77	1,686.01	-61.27	
14,066.00	90.70	0.77	11,890.22	1,597.87 N	971.16 W	506,112.27	725,550.14	1.77	1,688.00	-61.27	
14,068.00	90.71	0.74	11,890.19	1,599.87 N	971.13 W	506,114.27	725,550.17	1.77	1,689.98	-61.27	
14,070.00	90.73	0.71	11,890.17	1,601.87 N	971.10 W	506,116.27	725,550.20	1.77	1,691.97	-61.27	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
14,072.00	90.75	0.68	11,890.14	1,603.87 N	971.08 W	506,118.27	725,550.22	1.77	1,693.96	-61.27	
14,074.00	90.76	0.65	11,890.11	1,605.87 N	971.06 W	506,120.27	725,550.24	1.77	1,695.94	-61.27	
14,076.00	90.78	0.62	11,890.09	1,607.87 N	971.03 W	506,122.27	725,550.27	1.77	1,697.93	-61.27	
14,078.00	90.80	0.59	11,890.06	1,609.87 N	971.01 W	506,124.27	725,550.29	1.77	1,699.92	-61.27	
14,080.00	90.81	0.56	11,890.03	1,611.87 N	970.99 W	506,126.27	725,550.31	1.77	1,701.91	-61.27	
14,082.00	90.83	0.53	11,890.00	1,613.87 N	970.97 W	506,128.27	725,550.33	1.77	1,703.89	-61.28	
14,084.00	90.85	0.49	11,889.97	1,615.86 N	970.96 W	506,130.26	725,550.34	1.77	1,705.88	-61.28	
14,086.00	90.87	0.46	11,889.94	1,617.86 N	970.94 W	506,132.26	725,550.36	1.77	1,707.87	-61.28	
14,088.00	90.88	0.43	11,889.91	1,619.86 N	970.92 W	506,134.26	725,550.38	1.77	1,709.86	-61.28	
14,090.00	90.90	0.40	11,889.88	1,621.86 N	970.91 W	506,136.26	725,550.39	1.77	1,711.85	-61.28	
14,092.00	90.92	0.37	11,889.85	1,623.86 N	970.90 W	506,138.26	725,550.40	1.77	1,713.83	-61.28	
14,094.00	90.93	0.34	11,889.82	1,625.86 N	970.88 W	506,140.26	725,550.42	1.77	1,715.82	-61.28	
14,096.00	90.95	0.31	11,889.79	1,627.86 N	970.87 W	506,142.26	725,550.43	1.77	1,717.81	-61.28	
14,098.00	90.97	0.28	11,889.75	1,629.86 N	970.86 W	506,144.26	725,550.44	1.77	1,719.80	-61.28	
14,100.00	90.98	0.25	11,889.72	1,631.86 N	970.85 W	506,146.26	725,550.45	1.77	1,721.79	-61.28	
14,102.00	91.00	0.21	11,889.68	1,633.86 N	970.84 W	506,148.26	725,550.46	1.77	1,723.78	-61.28	
14,104.00	91.02	0.18	11,889.65	1,635.86 N	970.84 W	506,150.26	725,550.46	1.77	1,725.76	-61.28	
14,106.00	91.04	0.15	11,889.61	1,637.86 N	970.83 W	506,152.26	725,550.47	1.77	1,727.75	-61.28	
14,108.00	91.05	0.12	11,889.58	1,639.86 N	970.83 W	506,154.26	725,550.47	1.77	1,729.74	-61.28	
14,110.00	91.07	0.09	11,889.54	1,641.86 N	970.82 W	506,156.26	725,550.48	1.77	1,731.73	-61.28	
14,112.00	91.09	0.06	11,889.50	1,643.86 N	970.82 W	506,158.26	725,550.48	1.77	1,733.72	-61.28	
14,114.00	91.10	0.03	11,889.46	1,645.86 N	970.82 W	506,160.26	725,550.48	1.77	1,735.71	-61.28	
14,116.00	91.12	360.00	11,889.42	1,647.86 N	970.82 W	506,162.26	725,550.48	1.77	1,737.70	-61.28	
14,118.00	91.14	359.97	11,889.38	1,649.86 N	970.82 W	506,164.26	725,550.48	1.77	1,739.69	-61.28	
14,120.00	91.15	359.94	11,889.34	1,651.86 N	970.82 W	506,166.26	725,550.48	1.77	1,741.68	-61.29	
14,122.00	91.17	359.90	11,889.30	1,653.86 N	970.82 W	506,168.26	725,550.48	1.77	1,743.67	-61.29	
14,124.00	91.19	359.87	11,889.26	1,655.86 N	970.83 W	506,170.26	725,550.47	1.77	1,745.66	-61.29	
14,126.00	91.21	359.84	11,889.22	1,657.86 N	970.83 W	506,172.26	725,550.47	1.77	1,747.65	-61.29	
14,128.00	91.22	359.81	11,889.18	1,659.86 N	970.84 W	506,174.26	725,550.46	1.77	1,749.64	-61.29	
14,130.00	91.24	359.78	11,889.14	1,661.86 N	970.85 W	506,176.26	725,550.45	1.77	1,751.63	-61.29	
14,132.00	91.20	359.81	11,889.09	1,663.86 N	970.85 W	506,178.26	725,550.45	2.34	1,753.62	141.37	
14,134.00	91.17	359.84	11,889.05	1,665.86 N	970.86 W	506,180.26	725,550.44	2.34	1,755.61	141.37	
14,136.00	91.13	359.87	11,889.01	1,667.86 N	970.86 W	506,182.26	725,550.44	2.34	1,757.60	141.38	
14,138.00	91.09	359.90	11,888.97	1,669.85 N	970.87 W	506,184.25	725,550.43	2.34	1,759.59	141.38	
14,140.00	91.06	359.93	11,888.94	1,671.85 N	970.87 W	506,186.25	725,550.43	2.34	1,761.58	141.38	
14,142.00	91.02	359.96	11,888.90	1,673.85 N	970.87 W	506,188.25	725,550.43	2.34	1,763.56	141.38	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
14,144.00	90.98	359.98	11,888.86	1,675.85 N	970.87 W	506,190.25	725,550.43	2.34	1,765.55	141.38	
14,146.00	90.95	0.01	11,888.83	1,677.85 N	970.87 W	506,192.25	725,550.43	2.34	1,767.54	141.38	
14,148.00	90.91	0.04	11,888.80	1,679.85 N	970.87 W	506,194.25	725,550.43	2.34	1,769.53	141.38	
14,150.00	90.87	0.07	11,888.77	1,681.85 N	970.87 W	506,196.25	725,550.43	2.34	1,771.52	141.38	
14,152.00	90.84	0.10	11,888.74	1,683.85 N	970.87 W	506,198.25	725,550.43	2.34	1,773.51	141.38	
14,154.00	90.80	0.13	11,888.71	1,685.85 N	970.86 W	506,200.25	725,550.44	2.34	1,775.50	141.38	
14,156.00	90.76	0.16	11,888.68	1,687.85 N	970.86 W	506,202.25	725,550.44	2.34	1,777.49	141.38	
14,158.00	90.73	0.19	11,888.66	1,689.85 N	970.85 W	506,204.25	725,550.45	2.34	1,779.48	141.38	
14,160.00	90.69	0.22	11,888.63	1,691.85 N	970.85 W	506,206.25	725,550.45	2.34	1,781.47	141.38	
14,162.00	90.65	0.25	11,888.61	1,693.85 N	970.84 W	506,208.25	725,550.46	2.34	1,783.46	141.38	
14,164.00	90.62	0.28	11,888.58	1,695.85 N	970.83 W	506,210.25	725,550.47	2.34	1,785.44	141.38	
14,166.00	90.58	0.31	11,888.56	1,697.85 N	970.82 W	506,212.25	725,550.48	2.34	1,787.43	141.38	
14,168.00	90.54	0.34	11,888.54	1,699.85 N	970.81 W	506,214.25	725,550.49	2.34	1,789.42	141.38	
14,170.00	90.51	0.37	11,888.53	1,701.85 N	970.80 W	506,216.25	725,550.50	2.34	1,791.41	141.38	
14,172.00	90.47	0.39	11,888.51	1,703.85 N	970.78 W	506,218.25	725,550.52	2.34	1,793.40	141.38	
14,174.00	90.43	0.42	11,888.49	1,705.85 N	970.77 W	506,220.25	725,550.53	2.34	1,795.39	141.38	
14,176.00	90.40	0.45	11,888.48	1,707.85 N	970.75 W	506,222.25	725,550.55	2.34	1,797.37	141.38	
14,178.00	90.36	0.48	11,888.47	1,709.85 N	970.74 W	506,224.25	725,550.56	2.34	1,799.36	141.38	
14,180.00	90.32	0.51	11,888.45	1,711.85 N	970.72 W	506,226.25	725,550.58	2.34	1,801.35	141.38	
14,182.00	90.29	0.54	11,888.44	1,713.85 N	970.70 W	506,228.25	725,550.60	2.34	1,803.34	141.38	
14,184.00	90.25	0.57	11,888.43	1,715.85 N	970.68 W	506,230.25	725,550.62	2.34	1,805.33	141.38	
14,186.00	90.21	0.60	11,888.42	1,717.85 N	970.66 W	506,232.25	725,550.64	2.34	1,807.31	141.38	
14,188.00	90.18	0.63	11,888.42	1,719.85 N	970.64 W	506,234.25	725,550.66	2.34	1,809.30	141.38	
14,190.00	90.14	0.66	11,888.41	1,721.85 N	970.62 W	506,236.25	725,550.68	2.34	1,811.29	141.38	
14,192.00	90.10	0.69	11,888.41	1,723.85 N	970.59 W	506,238.25	725,550.71	2.34	1,813.28	141.38	
14,194.00	90.07	0.72	11,888.41	1,725.85 N	970.57 W	506,240.25	725,550.73	2.34	1,815.26	141.38	
14,196.00	90.03	0.75	11,888.40	1,727.85 N	970.54 W	506,242.25	725,550.76	2.34	1,817.25	141.38	
14,198.00	89.99	0.77	11,888.40	1,729.85 N	970.52 W	506,244.25	725,550.78	2.34	1,819.24	141.38	
14,200.00	89.96	0.80	11,888.40	1,731.85 N	970.49 W	506,246.25	725,550.81	2.34	1,821.22	141.38	
14,202.00	89.92	0.83	11,888.41	1,733.85 N	970.46 W	506,248.25	725,550.84	2.34	1,823.21	141.38	
14,204.00	89.88	0.86	11,888.41	1,735.85 N	970.43 W	506,250.25	725,550.87	2.34	1,825.20	141.38	
14,206.00	89.85	0.89	11,888.41	1,737.85 N	970.40 W	506,252.25	725,550.90	2.34	1,827.18	141.38	
14,208.00	89.81	0.92	11,888.42	1,739.85 N	970.37 W	506,254.25	725,550.93	2.34	1,829.17	141.38	
14,210.00	89.77	0.95	11,888.43	1,741.85 N	970.34 W	506,256.25	725,550.96	2.34	1,831.15	141.38	
14,212.00	89.74	0.98	11,888.44	1,743.85 N	970.30 W	506,258.25	725,551.00	2.34	1,833.14	141.38	
14,214.00	89.70	1.01	11,888.45	1,745.85 N	970.27 W	506,260.25	725,551.03	2.34	1,835.13	141.38	
14,216.00	89.66	1.04	11,888.46	1,747.85 N	970.23 W	506,262.25	725,551.07	2.34	1,837.11	141.38	



Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
14,218.00	89.63	1.07	11,888.47	1,749.85 N	970.20 W	506,264.25	725,551.10	2.34	1,839.10	141.38	
14,220.00	89.59	1.10	11,888.48	1,751.85 N	970.16 W	506,266.25	725,551.14	2.34	1,841.08	141.38	
14,222.00	89.55	1.13	11,888.50	1,753.85 N	970.12 W	506,268.25	725,551.18	2.34	1,843.07	141.38	
14,224.00	89.52	1.16	11,888.51	1,755.85 N	970.08 W	506,270.25	725,551.22	2.34	1,845.05	141.38	
14,226.00	89.52	1.16	11,888.53	1,757.85 N	970.04 W	506,272.25	725,551.26	0.37	1,847.04	104.04	
14,228.00	89.55	1.15	11,888.55	1,759.84 N	970.00 W	506,274.24	725,551.30	1.81	1,849.02	-24.33	
14,230.00	89.58	1.13	11,888.56	1,761.84 N	969.96 W	506,276.24	725,551.34	1.81	1,851.01	-24.33	
14,232.00	89.62	1.12	11,888.58	1,763.84 N	969.92 W	506,278.24	725,551.38	1.81	1,853.00	-24.33	
14,234.00	89.65	1.10	11,888.59	1,765.84 N	969.88 W	506,280.24	725,551.42	1.81	1,854.98	-24.33	
14,236.00	89.68	1.09	11,888.60	1,767.84 N	969.84 W	506,282.24	725,551.46	1.81	1,856.97	-24.33	
14,238.00	89.71	1.07	11,888.61	1,769.84 N	969.80 W	506,284.24	725,551.50	1.81	1,858.95	-24.33	
14,240.00	89.75	1.06	11,888.62	1,771.84 N	969.77 W	506,286.24	725,551.53	1.81	1,860.94	-24.33	
14,242.00	89.78	1.04	11,888.63	1,773.84 N	969.73 W	506,288.24	725,551.57	1.81	1,862.92	-24.33	
14,244.00	89.81	1.03	11,888.64	1,775.84 N	969.69 W	506,290.24	725,551.61	1.81	1,864.91	-24.33	
14,246.00	89.85	1.01	11,888.64	1,777.84 N	969.66 W	506,292.24	725,551.64	1.81	1,866.89	-24.33	
14,248.00	89.88	1.00	11,888.65	1,779.84 N	969.62 W	506,294.24	725,551.68	1.81	1,868.88	-24.33	
14,250.00	89.91	0.98	11,888.65	1,781.84 N	969.59 W	506,296.24	725,551.71	1.81	1,870.87	-24.33	
14,252.00	89.95	0.97	11,888.65	1,783.84 N	969.55 W	506,298.24	725,551.75	1.81	1,872.85	-24.33	
14,254.00	89.98	0.95	11,888.65	1,785.84 N	969.52 W	506,300.24	725,551.78	1.81	1,874.84	-24.33	
14,256.00	90.01	0.94	11,888.65	1,787.84 N	969.49 W	506,302.24	725,551.81	1.81	1,876.82	-24.33	
14,258.00	90.05	0.92	11,888.65	1,789.84 N	969.46 W	506,304.24	725,551.84	1.81	1,878.81	-24.33	
14,260.00	90.08	0.91	11,888.65	1,791.84 N	969.42 W	506,306.24	725,551.88	1.81	1,880.80	-24.33	
14,262.00	90.11	0.89	11,888.65	1,793.84 N	969.39 W	506,308.24	725,551.91	1.81	1,882.78	-24.33	
14,264.00	90.14	0.88	11,888.64	1,795.84 N	969.36 W	506,310.24	725,551.94	1.81	1,884.77	-24.33	
14,266.00	90.18	0.86	11,888.64	1,797.84 N	969.33 W	506,312.24	725,551.97	1.81	1,886.76	-24.33	
14,268.00	90.21	0.85	11,888.63	1,799.84 N	969.30 W	506,314.24	725,552.00	1.81	1,888.74	-24.33	
14,270.00	90.24	0.83	11,888.62	1,801.84 N	969.27 W	506,316.24	725,552.03	1.81	1,890.73	-24.33	
14,272.00	90.28	0.82	11,888.61	1,803.84 N	969.24 W	506,318.24	725,552.06	1.81	1,892.71	-24.33	
14,274.00	90.31	0.80	11,888.60	1,805.84 N	969.21 W	506,320.24	725,552.09	1.81	1,894.70	-24.33	
14,276.00	90.34	0.79	11,888.59	1,807.84 N	969.19 W	506,322.24	725,552.11	1.81	1,896.69	-24.33	
14,278.00	90.38	0.77	11,888.58	1,809.84 N	969.16 W	506,324.24	725,552.14	1.81	1,898.68	-24.33	
14,280.00	90.41	0.76	11,888.57	1,811.84 N	969.13 W	506,326.24	725,552.17	1.81	1,900.66	-24.33	
14,282.00	90.44	0.74	11,888.55	1,813.84 N	969.11 W	506,328.24	725,552.19	1.81	1,902.65	-24.33	
14,284.00	90.48	0.73	11,888.54	1,815.84 N	969.08 W	506,330.24	725,552.22	1.81	1,904.64	-24.33	
14,286.00	90.51	0.71	11,888.52	1,817.84 N	969.06 W	506,332.24	725,552.24	1.81	1,906.62	-24.33	
14,288.00	90.54	0.70	11,888.50	1,819.84 N	969.03 W	506,334.24	725,552.27	1.81	1,908.61	-24.33	
14,290.00	90.57	0.68	11,888.48	1,821.84 N	969.01 W	506,336.24	725,552.29	1.81	1,910.60	-24.33	



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Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
14,292.00	90.61	0.67	11,888.46	1,823.84 N	968.98 W	506,338.24	725,552.32	1.81	1,912.58	-24.33	
14,294.00	90.64	0.65	11,888.44	1,825.84 N	968.96 W	506,340.24	725,552.34	1.81	1,914.57	-24.33	
14,296.00	90.67	0.64	11,888.41	1,827.84 N	968.94 W	506,342.24	725,552.36	1.81	1,916.56	-24.33	
14,298.00	90.71	0.62	11,888.39	1,829.83 N	968.92 W	506,344.23	725,552.38	1.81	1,918.55	-24.33	
14,300.00	90.74	0.61	11,888.37	1,831.83 N	968.89 W	506,346.23	725,552.41	1.81	1,920.53	-24.33	
14,302.00	90.77	0.59	11,888.34	1,833.83 N	968.87 W	506,348.23	725,552.43	1.81	1,922.52	-24.33	
14,304.00	90.81	0.58	11,888.31	1,835.83 N	968.85 W	506,350.23	725,552.45	1.81	1,924.51	-24.33	
14,306.00	90.84	0.56	11,888.28	1,837.83 N	968.83 W	506,352.23	725,552.47	1.81	1,926.49	-24.33	
14,308.00	90.87	0.55	11,888.25	1,839.83 N	968.81 W	506,354.23	725,552.49	1.81	1,928.48	-24.33	
14,310.00	90.90	0.53	11,888.22	1,841.83 N	968.79 W	506,356.23	725,552.51	1.81	1,930.47	-24.33	
14,312.00	90.94	0.52	11,888.19	1,843.83 N	968.78 W	506,358.23	725,552.52	1.81	1,932.46	-24.34	
14,314.00	90.97	0.50	11,888.16	1,845.83 N	968.76 W	506,360.23	725,552.54	1.81	1,934.44	-24.34	
14,316.00	91.00	0.49	11,888.12	1,847.83 N	968.74 W	506,362.23	725,552.56	1.81	1,936.43	-24.34	
14,318.00	91.04	0.47	11,888.09	1,849.83 N	968.72 W	506,364.23	725,552.58	1.81	1,938.42	-24.34	
14,320.00	91.07	0.46	11,888.05	1,851.83 N	968.71 W	506,366.23	725,552.59	1.81	1,940.41	-24.34	
14,322.00	91.06	0.48	11,888.01	1,853.83 N	968.69 W	506,368.23	725,552.61	1.10	1,942.39	112.10	
14,324.00	91.05	0.50	11,887.98	1,855.83 N	968.67 W	506,370.23	725,552.63	1.10	1,944.38	112.10	
14,326.00	91.05	0.52	11,887.94	1,857.83 N	968.66 W	506,372.23	725,552.64	1.10	1,946.37	112.10	
14,328.00	91.04	0.54	11,887.90	1,859.83 N	968.64 W	506,374.23	725,552.66	1.10	1,948.36	112.11	
14,330.00	91.03	0.56	11,887.87	1,861.83 N	968.62 W	506,376.23	725,552.68	1.10	1,950.34	112.11	
14,332.00	91.02	0.58	11,887.83	1,863.83 N	968.60 W	506,378.23	725,552.70	1.10	1,952.33	112.11	
14,334.00	91.01	0.60	11,887.80	1,865.83 N	968.58 W	506,380.23	725,552.72	1.10	1,954.32	112.11	
14,336.00	91.00	0.62	11,887.76	1,867.83 N	968.56 W	506,382.23	725,552.74	1.10	1,956.31	112.11	
14,338.00	91.00	0.64	11,887.73	1,869.83 N	968.53 W	506,384.23	725,552.77	1.10	1,958.29	112.11	
14,340.00	90.99	0.66	11,887.69	1,871.83 N	968.51 W	506,386.23	725,552.79	1.10	1,960.28	112.11	
14,342.00	90.98	0.68	11,887.66	1,873.83 N	968.49 W	506,388.23	725,552.81	1.10	1,962.27	112.11	
14,344.00	90.97	0.71	11,887.62	1,875.83 N	968.46 W	506,390.23	725,552.84	1.10	1,964.25	112.11	
14,346.00	90.96	0.73	11,887.59	1,877.83 N	968.44 W	506,392.23	725,552.86	1.10	1,966.24	112.11	
14,348.00	90.95	0.75	11,887.56	1,879.83 N	968.41 W	506,394.23	725,552.89	1.10	1,968.23	112.11	
14,350.00	90.95	0.77	11,887.52	1,881.82 N	968.39 W	506,396.22	725,552.91	1.10	1,970.21	112.11	
14,352.00	90.94	0.79	11,887.49	1,883.82 N	968.36 W	506,398.22	725,552.94	1.10	1,972.20	112.11	
14,354.00	90.93	0.81	11,887.46	1,885.82 N	968.33 W	506,400.22	725,552.97	1.10	1,974.19	112.11	
14,356.00	90.92	0.83	11,887.42	1,887.82 N	968.30 W	506,402.22	725,553.00	1.10	1,976.17	112.11	
14,358.00	90.91	0.85	11,887.39	1,889.82 N	968.27 W	506,404.22	725,553.03	1.10	1,978.16	112.11	
14,360.00	90.90	0.87	11,887.36	1,891.82 N	968.24 W	506,406.22	725,553.06	1.10	1,980.15	112.11	
14,362.00	90.90	0.89	11,887.33	1,893.82 N	968.21 W	506,408.22	725,553.09	1.10	1,982.13	112.11	

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Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
14,364.00	90.89	0.91	11,887.30	1,895.82 N	968.18 W	506,410.22	725,553.12	1.10	1,984.12	112.11	
14,366.00	90.88	0.93	11,887.27	1,897.82 N	968.15 W	506,412.22	725,553.15	1.10	1,986.10	112.11	
14,368.00	90.87	0.95	11,887.24	1,899.82 N	968.12 W	506,414.22	725,553.18	1.10	1,988.09	112.11	
14,370.00	90.86	0.97	11,887.21	1,901.82 N	968.08 W	506,416.22	725,553.22	1.10	1,990.08	112.11	
14,372.00	90.85	0.99	11,887.18	1,903.82 N	968.05 W	506,418.22	725,553.25	1.10	1,992.06	112.11	
14,374.00	90.85	1.01	11,887.15	1,905.82 N	968.01 W	506,420.22	725,553.29	1.10	1,994.05	112.11	
14,376.00	90.84	1.03	11,887.12	1,907.82 N	967.98 W	506,422.22	725,553.32	1.10	1,996.03	112.11	
14,378.00	90.83	1.05	11,887.09	1,909.82 N	967.94 W	506,424.22	725,553.36	1.10	1,998.02	112.11	
14,380.00	90.82	1.07	11,887.06	1,911.82 N	967.90 W	506,426.22	725,553.40	1.10	2,000.00	112.11	
14,382.00	90.81	1.09	11,887.03	1,913.82 N	967.87 W	506,428.22	725,553.43	1.10	2,001.99	112.11	
14,384.00	90.80	1.11	11,887.00	1,915.82 N	967.83 W	506,430.22	725,553.47	1.10	2,003.97	112.11	
14,386.00	90.80	1.13	11,886.97	1,917.82 N	967.79 W	506,432.22	725,553.51	1.10	2,005.96	112.11	
14,388.00	90.79	1.15	11,886.95	1,919.81 N	967.75 W	506,434.21	725,553.55	1.10	2,007.94	112.11	
14,390.00	90.78	1.17	11,886.92	1,921.81 N	967.71 W	506,436.21	725,553.59	1.10	2,009.93	112.12	
14,392.00	90.77	1.20	11,886.89	1,923.81 N	967.67 W	506,438.21	725,553.63	1.10	2,011.91	112.12	
14,394.00	90.76	1.22	11,886.87	1,925.81 N	967.63 W	506,440.21	725,553.67	1.10	2,013.90	112.12	
14,396.00	90.75	1.24	11,886.84	1,927.81 N	967.58 W	506,442.21	725,553.72	1.10	2,015.88	112.12	
14,398.00	90.75	1.26	11,886.81	1,929.81 N	967.54 W	506,444.21	725,553.76	1.10	2,017.87	112.12	
14,400.00	90.74	1.28	11,886.79	1,931.81 N	967.49 W	506,446.21	725,553.81	1.10	2,019.85	112.12	
14,402.00	90.73	1.30	11,886.76	1,933.81 N	967.45 W	506,448.21	725,553.85	1.10	2,021.84	112.12	
14,404.00	90.72	1.32	11,886.74	1,935.81 N	967.40 W	506,450.21	725,553.90	1.10	2,023.82	112.12	
14,406.00	90.71	1.34	11,886.71	1,937.81 N	967.36 W	506,452.21	725,553.94	1.10	2,025.81	112.12	
14,408.00	90.70	1.36	11,886.69	1,939.81 N	967.31 W	506,454.21	725,553.99	1.10	2,027.79	112.12	
14,410.00	90.70	1.38	11,886.66	1,941.81 N	967.26 W	506,456.21	725,554.04	1.10	2,029.78	112.12	
14,412.00	90.69	1.40	11,886.64	1,943.81 N	967.21 W	506,458.21	725,554.09	1.10	2,031.76	112.12	
14,414.00	90.68	1.42	11,886.61	1,945.81 N	967.17 W	506,460.21	725,554.13	1.10	2,033.74	112.12	
14,416.00	90.64	1.40	11,886.59	1,947.81 N	967.12 W	506,462.21	725,554.18	2.11	2,035.73	-156.76	
14,418.00	90.60	1.39	11,886.57	1,949.80 N	967.07 W	506,464.20	725,554.23	2.11	2,037.71	-156.76	
14,420.00	90.56	1.37	11,886.55	1,951.80 N	967.02 W	506,466.20	725,554.28	2.11	2,039.70	-156.76	
14,422.00	90.53	1.35	11,886.53	1,953.80 N	966.97 W	506,468.20	725,554.33	2.11	2,041.68	-156.76	
14,424.00	90.49	1.34	11,886.51	1,955.80 N	966.92 W	506,470.20	725,554.38	2.11	2,043.66	-156.77	
14,426.00	90.45	1.32	11,886.50	1,957.80 N	966.88 W	506,472.20	725,554.42	2.11	2,045.65	-156.77	
14,428.00	90.41	1.30	11,886.48	1,959.80 N	966.83 W	506,474.20	725,554.47	2.11	2,047.63	-156.77	
14,430.00	90.37	1.29	11,886.47	1,961.80 N	966.79 W	506,476.20	725,554.51	2.11	2,049.62	-156.77	
14,432.00	90.33	1.27	11,886.46	1,963.80 N	966.74 W	506,478.20	725,554.56	2.11	2,051.60	-156.77	
14,434.00	90.29	1.25	11,886.44	1,965.80 N	966.70 W	506,480.20	725,554.60	2.11	2,053.59	-156.77	
14,436.00	90.25	1.24	11,886.43	1,967.80 N	966.66 W	506,482.20	725,554.64	2.11	2,055.57	-156.77	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
14,438.00	90.22	1.22	11,886.43	1,969.80 N	966.61 W	506,484.20	725,554.69	2.11	2,057.56	-156.77	
14,440.00	90.18	1.20	11,886.42	1,971.80 N	966.57 W	506,486.20	725,554.73	2.11	2,059.54	-156.77	
14,442.00	90.14	1.19	11,886.41	1,973.80 N	966.53 W	506,488.20	725,554.77	2.11	2,061.53	-156.77	
14,444.00	90.10	1.17	11,886.41	1,975.80 N	966.49 W	506,490.20	725,554.81	2.11	2,063.51	-156.77	
14,446.00	90.06	1.15	11,886.41	1,977.80 N	966.45 W	506,492.20	725,554.85	2.11	2,065.50	-156.77	
14,448.00	90.02	1.14	11,886.41	1,979.80 N	966.41 W	506,494.20	725,554.89	2.11	2,067.48	-156.77	
14,450.00	89.98	1.12	11,886.41	1,981.80 N	966.37 W	506,496.20	725,554.93	2.11	2,069.47	-156.77	
14,452.00	89.94	1.10	11,886.41	1,983.80 N	966.33 W	506,498.20	725,554.97	2.11	2,071.45	-156.77	
14,454.00	89.91	1.09	11,886.41	1,985.80 N	966.29 W	506,500.20	725,555.01	2.11	2,073.44	-156.77	
14,456.00	89.87	1.07	11,886.41	1,987.80 N	966.25 W	506,502.20	725,555.05	2.11	2,075.42	-156.77	
14,458.00	89.83	1.05	11,886.42	1,989.80 N	966.22 W	506,504.20	725,555.08	2.11	2,077.41	-156.77	
14,460.00	89.79	1.04	11,886.43	1,991.79 N	966.18 W	506,506.19	725,555.12	2.11	2,079.40	-156.77	
14,462.00	89.75	1.02	11,886.43	1,993.79 N	966.14 W	506,508.19	725,555.16	2.11	2,081.38	-156.77	
14,464.00	89.71	1.00	11,886.44	1,995.79 N	966.11 W	506,510.19	725,555.19	2.11	2,083.37	-156.77	
14,466.00	89.67	0.99	11,886.45	1,997.79 N	966.07 W	506,512.19	725,555.23	2.11	2,085.35	-156.77	
14,468.00	89.63	0.97	11,886.47	1,999.79 N	966.04 W	506,514.19	725,555.26	2.11	2,087.34	-156.77	
14,470.00	89.60	0.95	11,886.48	2,001.79 N	966.01 W	506,516.19	725,555.29	2.11	2,089.32	-156.77	
14,472.00	89.56	0.94	11,886.49	2,003.79 N	965.97 W	506,518.19	725,555.33	2.11	2,091.31	-156.77	
14,474.00	89.52	0.92	11,886.51	2,005.79 N	965.94 W	506,520.19	725,555.36	2.11	2,093.30	-156.77	
14,476.00	89.48	0.90	11,886.53	2,007.79 N	965.91 W	506,522.19	725,555.39	2.11	2,095.28	-156.77	
14,478.00	89.44	0.89	11,886.55	2,009.79 N	965.88 W	506,524.19	725,555.42	2.11	2,097.27	-156.77	
14,480.00	89.40	0.87	11,886.57	2,011.79 N	965.85 W	506,526.19	725,555.45	2.11	2,099.26	-156.77	
14,482.00	89.36	0.85	11,886.59	2,013.79 N	965.82 W	506,528.19	725,555.48	2.11	2,101.24	-156.76	
14,484.00	89.32	0.84	11,886.61	2,015.79 N	965.79 W	506,530.19	725,555.51	2.11	2,103.23	-156.76	
14,486.00	89.29	0.82	11,886.64	2,017.79 N	965.76 W	506,532.19	725,555.54	2.11	2,105.21	-156.76	
14,488.00	89.25	0.80	11,886.66	2,019.79 N	965.73 W	506,534.19	725,555.57	2.11	2,107.20	-156.76	
14,490.00	89.21	0.79	11,886.69	2,021.79 N	965.70 W	506,536.19	725,555.60	2.11	2,109.19	-156.76	
14,492.00	89.17	0.77	11,886.72	2,023.79 N	965.67 W	506,538.19	725,555.63	2.11	2,111.17	-156.76	
14,494.00	89.13	0.75	11,886.75	2,025.79 N	965.65 W	506,540.19	725,555.65	2.11	2,113.16	-156.76	
14,496.00	89.09	0.74	11,886.78	2,027.79 N	965.62 W	506,542.19	725,555.68	2.11	2,115.15	-156.76	
14,498.00	89.05	0.72	11,886.81	2,029.79 N	965.60 W	506,544.19	725,555.70	2.11	2,117.13	-156.76	
14,500.00	89.01	0.70	11,886.84	2,031.79 N	965.57 W	506,546.19	725,555.73	2.11	2,119.12	-156.76	
14,502.00	88.98	0.69	11,886.88	2,033.79 N	965.55 W	506,548.19	725,555.75	2.11	2,121.11	-156.76	
14,504.00	88.94	0.67	11,886.92	2,035.79 N	965.52 W	506,550.19	725,555.78	2.11	2,123.09	-156.76	
14,506.00	88.90	0.65	11,886.95	2,037.79 N	965.50 W	506,552.19	725,555.80	2.11	2,125.08	-156.76	
14,508.00	88.86	0.64	11,886.99	2,039.79 N	965.48 W	506,554.19	725,555.82	2.11	2,127.07	-156.76	
14,510.00	88.84	0.61	11,887.03	2,041.79 N	965.46 W	506,556.19	725,555.84	1.45	2,129.06	-124.50	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
14,512.00	88.85	0.58	11,887.07	2,043.78 N	965.43 W	506,558.18	725,555.87	1.59	2,131.04	-79.30	
14,514.00	88.85	0.55	11,887.11	2,045.78 N	965.41 W	506,560.18	725,555.89	1.59	2,133.03	-79.30	
14,516.00	88.86	0.52	11,887.15	2,047.78 N	965.40 W	506,562.18	725,555.90	1.59	2,135.02	-79.30	
14,518.00	88.87	0.49	11,887.19	2,049.78 N	965.38 W	506,564.18	725,555.92	1.59	2,137.00	-79.30	
14,520.00	88.87	0.46	11,887.23	2,051.78 N	965.36 W	506,566.18	725,555.94	1.59	2,138.99	-79.30	
14,522.00	88.88	0.43	11,887.27	2,053.78 N	965.35 W	506,568.18	725,555.95	1.59	2,140.98	-79.30	
14,524.00	88.88	0.40	11,887.31	2,055.78 N	965.33 W	506,570.18	725,555.97	1.59	2,142.97	-79.29	
14,526.00	88.89	0.37	11,887.35	2,057.78 N	965.32 W	506,572.18	725,555.98	1.59	2,144.96	-79.29	
14,528.00	88.90	0.33	11,887.39	2,059.78 N	965.31 W	506,574.18	725,555.99	1.59	2,146.94	-79.29	
14,530.00	88.90	0.30	11,887.43	2,061.78 N	965.30 W	506,576.18	725,556.00	1.59	2,148.93	-79.29	
14,532.00	88.91	0.27	11,887.46	2,063.78 N	965.29 W	506,578.18	725,556.01	1.59	2,150.92	-79.29	
14,534.00	88.91	0.24	11,887.50	2,065.78 N	965.28 W	506,580.18	725,556.02	1.59	2,152.91	-79.29	
14,536.00	88.92	0.21	11,887.54	2,067.78 N	965.27 W	506,582.18	725,556.03	1.59	2,154.90	-79.29	
14,538.00	88.93	0.18	11,887.58	2,069.78 N	965.26 W	506,584.18	725,556.04	1.59	2,156.89	-79.29	
14,540.00	88.93	0.15	11,887.61	2,071.78 N	965.26 W	506,586.18	725,556.04	1.59	2,158.87	-79.29	
14,542.00	88.94	0.12	11,887.65	2,073.78 N	965.25 W	506,588.18	725,556.05	1.59	2,160.86	-79.29	
14,544.00	88.94	0.08	11,887.69	2,075.78 N	965.25 W	506,590.18	725,556.05	1.59	2,162.85	-79.29	
14,546.00	88.95	0.05	11,887.73	2,077.78 N	965.25 W	506,592.18	725,556.05	1.59	2,164.84	-79.29	
14,548.00	88.95	0.02	11,887.76	2,079.78 N	965.24 W	506,594.18	725,556.06	1.59	2,166.83	-79.29	
14,550.00	88.96	359.99	11,887.80	2,081.78 N	965.24 W	506,596.18	725,556.06	1.59	2,168.82	-79.29	
14,552.00	88.97	359.96	11,887.84	2,083.78 N	965.24 W	506,598.18	725,556.06	1.59	2,170.81	-79.29	
14,554.00	88.97	359.93	11,887.87	2,085.78 N	965.25 W	506,600.18	725,556.05	1.59	2,172.80	-79.29	
14,556.00	88.98	359.90	11,887.91	2,087.78 N	965.25 W	506,602.18	725,556.05	1.59	2,174.79	-79.29	
14,558.00	88.98	359.87	11,887.94	2,089.78 N	965.25 W	506,604.18	725,556.05	1.59	2,176.78	-79.29	
14,560.00	88.99	359.84	11,887.98	2,091.78 N	965.26 W	506,606.18	725,556.04	1.59	2,178.77	-79.28	
14,562.00	89.00	359.80	11,888.01	2,093.78 N	965.27 W	506,608.18	725,556.03	1.59	2,180.76	-79.28	
14,564.00	89.00	359.77	11,888.05	2,095.77 N	965.27 W	506,610.17	725,556.03	1.59	2,182.75	-79.28	
14,566.00	89.01	359.74	11,888.08	2,097.77 N	965.28 W	506,612.17	725,556.02	1.59	2,184.74	-79.28	
14,568.00	89.01	359.71	11,888.12	2,099.77 N	965.29 W	506,614.17	725,556.01	1.59	2,186.73	-79.28	
14,570.00	89.02	359.68	11,888.15	2,101.77 N	965.30 W	506,616.17	725,556.00	1.59	2,188.72	-79.28	
14,572.00	89.03	359.65	11,888.19	2,103.77 N	965.31 W	506,618.17	725,555.99	1.59	2,190.71	-79.28	
14,574.00	89.03	359.62	11,888.22	2,105.77 N	965.33 W	506,620.17	725,555.97	1.59	2,192.70	-79.28	
14,576.00	89.04	359.59	11,888.25	2,107.77 N	965.34 W	506,622.17	725,555.96	1.59	2,194.69	-79.28	
14,578.00	89.04	359.56	11,888.29	2,109.77 N	965.35 W	506,624.17	725,555.95	1.59	2,196.68	-79.28	
14,580.00	89.05	359.52	11,888.32	2,111.77 N	965.37 W	506,626.17	725,555.93	1.59	2,198.67	-79.28	
14,582.00	89.06	359.49	11,888.35	2,113.77 N	965.39 W	506,628.17	725,555.91	1.59	2,200.67	-79.28	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
14,584.00	89.06	359.46	11,888.39	2,115.77 N	965.41 W	506,630.17	725,555.89	1.59	2,202.66	-79.28	
14,586.00	89.07	359.43	11,888.42	2,117.77 N	965.43 W	506,632.17	725,555.87	1.59	2,204.65	-79.28	
14,588.00	89.07	359.40	11,888.45	2,119.77 N	965.45 W	506,634.17	725,555.85	1.59	2,206.64	-79.28	
14,590.00	89.08	359.37	11,888.48	2,121.77 N	965.47 W	506,636.17	725,555.83	1.59	2,208.63	-79.28	
14,592.00	89.08	359.34	11,888.52	2,123.77 N	965.49 W	506,638.17	725,555.81	1.59	2,210.62	-79.28	
14,594.00	89.09	359.31	11,888.55	2,125.77 N	965.51 W	506,640.17	725,555.79	1.59	2,212.61	-79.28	
14,596.00	89.10	359.27	11,888.58	2,127.77 N	965.54 W	506,642.17	725,555.76	1.59	2,214.61	-79.28	
14,598.00	89.10	359.24	11,888.61	2,129.77 N	965.56 W	506,644.17	725,555.74	1.59	2,216.60	-79.27	
14,600.00	89.11	359.21	11,888.64	2,131.77 N	965.59 W	506,646.17	725,555.71	1.59	2,218.59	-79.27	
14,602.00	89.11	359.18	11,888.67	2,133.77 N	965.62 W	506,648.17	725,555.68	1.59	2,220.58	-79.27	
14,604.00	89.12	359.15	11,888.70	2,135.77 N	965.65 W	506,650.17	725,555.65	1.59	2,222.57	-79.27	
14,606.00	89.10	359.15	11,888.73	2,137.77 N	965.68 W	506,652.17	725,555.62	0.94	2,224.57	-176.14	
14,608.00	89.08	359.15	11,888.77	2,139.77 N	965.71 W	506,654.17	725,555.59	0.94	2,226.56	-176.14	
14,610.00	89.06	359.15	11,888.80	2,141.77 N	965.74 W	506,656.17	725,555.56	0.94	2,228.55	-176.14	
14,612.00	89.05	359.14	11,888.83	2,143.77 N	965.77 W	506,658.17	725,555.53	0.94	2,230.54	-176.14	
14,614.00	89.03	359.14	11,888.87	2,145.76 N	965.80 W	506,660.16	725,555.50	0.94	2,232.54	-176.14	
14,616.00	89.01	359.14	11,888.90	2,147.76 N	965.83 W	506,662.16	725,555.47	0.94	2,234.53	-176.14	
14,618.00	88.99	359.14	11,888.93	2,149.76 N	965.86 W	506,664.16	725,555.44	0.94	2,236.52	-176.14	
14,620.00	88.97	359.14	11,888.97	2,151.76 N	965.89 W	506,666.16	725,555.41	0.94	2,238.51	-176.14	
14,622.00	88.95	359.14	11,889.01	2,153.76 N	965.92 W	506,668.16	725,555.38	0.94	2,240.50	-176.14	
14,624.00	88.93	359.14	11,889.04	2,155.76 N	965.95 W	506,670.16	725,555.35	0.94	2,242.50	-176.14	
14,626.00	88.91	359.14	11,889.08	2,157.76 N	965.98 W	506,672.16	725,555.32	0.94	2,244.49	-176.14	
14,628.00	88.90	359.13	11,889.12	2,159.76 N	966.01 W	506,674.16	725,555.29	0.94	2,246.48	-176.14	
14,630.00	88.88	359.13	11,889.16	2,161.76 N	966.04 W	506,676.16	725,555.26	0.94	2,248.47	-176.14	
14,632.00	88.86	359.13	11,889.20	2,163.76 N	966.07 W	506,678.16	725,555.23	0.94	2,250.47	-176.14	
14,634.00	88.84	359.13	11,889.24	2,165.76 N	966.10 W	506,680.16	725,555.20	0.94	2,252.46	-176.14	
14,636.00	88.82	359.13	11,889.28	2,167.76 N	966.13 W	506,682.16	725,555.17	0.94	2,254.45	-176.14	
14,638.00	88.80	359.13	11,889.32	2,169.76 N	966.16 W	506,684.16	725,555.14	0.94	2,256.44	-176.14	
14,640.00	88.78	359.13	11,889.36	2,171.76 N	966.19 W	506,686.16	725,555.11	0.94	2,258.43	-176.14	
14,642.00	88.76	359.13	11,889.40	2,173.76 N	966.22 W	506,688.16	725,555.08	0.94	2,260.43	-176.14	
14,644.00	88.75	359.12	11,889.45	2,175.76 N	966.25 W	506,690.16	725,555.05	0.94	2,262.42	-176.14	
14,646.00	88.73	359.12	11,889.49	2,177.76 N	966.28 W	506,692.16	725,555.02	0.94	2,264.41	-176.14	
14,648.00	88.71	359.12	11,889.54	2,179.75 N	966.31 W	506,694.15	725,554.99	0.94	2,266.40	-176.14	
14,650.00	88.69	359.12	11,889.58	2,181.75 N	966.34 W	506,696.15	725,554.96	0.94	2,268.39	-176.14	
14,652.00	88.67	359.12	11,889.63	2,183.75 N	966.37 W	506,698.15	725,554.93	0.94	2,270.39	-176.14	
14,654.00	88.65	359.12	11,889.68	2,185.75 N	966.40 W	506,700.15	725,554.90	0.94	2,272.38	-176.14	
14,656.00	88.63	359.12	11,889.72	2,187.75 N	966.43 W	506,702.15	725,554.87	0.94	2,274.37	-176.14	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates (usft)		Map Coordinates (usft)		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing	Easting	Northing	Easting				
14,658.00	88.61	359.12	11,889.77	2,189.75 N	966.47 W	506,704.15	725,554.83	0.94	2,276.36	-176.14	
14,660.00	88.60	359.11	11,889.82	2,191.75 N	966.50 W	506,706.15	725,554.80	0.94	2,278.35	-176.14	
14,662.00	88.58	359.11	11,889.87	2,193.75 N	966.53 W	506,708.15	725,554.77	0.94	2,280.35	-176.14	
14,664.00	88.56	359.11	11,889.92	2,195.75 N	966.56 W	506,710.15	725,554.74	0.94	2,282.34	-176.14	
14,666.00	88.54	359.11	11,889.97	2,197.75 N	966.59 W	506,712.15	725,554.71	0.94	2,284.33	-176.14	
14,668.00	88.52	359.11	11,890.02	2,199.75 N	966.62 W	506,714.15	725,554.68	0.94	2,286.32	-176.14	
14,670.00	88.50	359.11	11,890.07	2,201.75 N	966.65 W	506,716.15	725,554.65	0.94	2,288.31	-176.14	
14,672.00	88.48	359.11	11,890.13	2,203.74 N	966.68 W	506,718.14	725,554.62	0.94	2,290.31	-176.14	
14,674.00	88.46	359.11	11,890.18	2,205.74 N	966.71 W	506,720.14	725,554.59	0.94	2,292.30	-176.14	
14,676.00	88.45	359.10	11,890.23	2,207.74 N	966.74 W	506,722.14	725,554.56	0.94	2,294.29	-176.14	
14,678.00	88.43	359.10	11,890.29	2,209.74 N	966.78 W	506,724.14	725,554.52	0.94	2,296.28	-176.14	
14,680.00	88.41	359.10	11,890.34	2,211.74 N	966.81 W	506,726.14	725,554.49	0.94	2,298.27	-176.14	
14,682.00	88.39	359.10	11,890.40	2,213.74 N	966.84 W	506,728.14	725,554.46	0.94	2,300.27	-176.14	
14,684.00	88.37	359.10	11,890.46	2,215.74 N	966.87 W	506,730.14	725,554.43	0.94	2,302.26	-176.14	
14,686.00	88.35	359.10	11,890.51	2,217.74 N	966.90 W	506,732.14	725,554.40	0.94	2,304.25	-176.14	
14,688.00	88.33	359.10	11,890.57	2,219.74 N	966.93 W	506,734.14	725,554.37	0.94	2,306.24	-176.14	
14,690.00	88.31	359.10	11,890.63	2,221.74 N	966.96 W	506,736.14	725,554.34	0.94	2,308.23	-176.14	
14,692.00	88.30	359.09	11,890.69	2,223.73 N	967.00 W	506,738.13	725,554.30	0.94	2,310.23	-176.14	
14,694.00	88.28	359.09	11,890.75	2,225.73 N	967.03 W	506,740.13	725,554.27	0.94	2,312.22	-176.14	
14,696.00	88.26	359.09	11,890.81	2,227.73 N	967.06 W	506,742.13	725,554.24	0.94	2,314.21	-176.14	
14,698.00	88.24	359.09	11,890.87	2,229.73 N	967.09 W	506,744.13	725,554.21	0.94	2,316.20	-176.14	
14,700.00	88.24	359.11	11,890.93	2,231.73 N	967.12 W	506,746.13	725,554.18	1.04	2,318.19	80.00	
14,702.00	88.27	359.15	11,890.99	2,233.73 N	967.15 W	506,748.13	725,554.15	2.47	2,320.18	58.38	
14,704.00	88.29	359.20	11,891.05	2,235.73 N	967.18 W	506,750.13	725,554.12	2.47	2,322.18	58.38	
14,706.00	88.32	359.24	11,891.11	2,237.73 N	967.21 W	506,752.13	725,554.09	2.47	2,324.17	58.37	
14,708.00	88.35	359.28	11,891.17	2,239.72 N	967.23 W	506,754.12	725,554.07	2.47	2,326.16	58.37	
14,710.00	88.37	359.32	11,891.23	2,241.72 N	967.26 W	506,756.12	725,554.04	2.47	2,328.15	58.37	
14,712.00	88.40	359.36	11,891.28	2,243.72 N	967.28 W	506,758.12	725,554.02	2.47	2,330.14	58.37	
14,714.00	88.42	359.41	11,891.34	2,245.72 N	967.30 W	506,760.12	725,554.00	2.47	2,332.13	58.37	
14,716.00	88.45	359.45	11,891.39	2,247.72 N	967.32 W	506,762.12	725,553.98	2.47	2,334.12	58.37	
14,718.00	88.48	359.49	11,891.45	2,249.72 N	967.34 W	506,764.12	725,553.96	2.47	2,336.11	58.37	
14,720.00	88.50	359.53	11,891.50	2,251.72 N	967.36 W	506,766.12	725,553.94	2.47	2,338.10	58.37	
14,722.00	88.53	359.57	11,891.55	2,253.72 N	967.37 W	506,768.12	725,553.93	2.47	2,340.09	58.37	
14,724.00	88.55	359.62	11,891.60	2,255.72 N	967.39 W	506,770.12	725,553.91	2.47	2,342.08	58.36	
14,726.00	88.58	359.66	11,891.65	2,257.72 N	967.40 W	506,772.12	725,553.90	2.47	2,344.08	58.36	
14,728.00	88.61	359.70	11,891.70	2,259.72 N	967.41 W	506,774.12	725,553.89	2.47	2,346.07	58.36	
14,730.00	88.63	359.74	11,891.75	2,261.72 N	967.42 W	506,776.12	725,553.88	2.47	2,348.06	58.36	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
14,732.00	88.66	359.79	11,891.80	2,263.72 N	967.43 W	506,778.12	725,553.87	2.47	2,350.05	58.36	
14,734.00	88.68	359.83	11,891.84	2,265.72 N	967.44 W	506,780.12	725,553.86	2.47	2,352.04	58.36	
14,736.00	88.71	359.87	11,891.89	2,267.71 N	967.44 W	506,782.11	725,553.86	2.47	2,354.03	58.36	
14,738.00	88.74	359.91	11,891.93	2,269.71 N	967.45 W	506,784.11	725,553.85	2.47	2,356.01	58.36	
14,740.00	88.76	359.95	11,891.98	2,271.71 N	967.45 W	506,786.11	725,553.85	2.47	2,358.00	58.36	
14,742.00	88.79	360.00	11,892.02	2,273.71 N	967.45 W	506,788.11	725,553.85	2.47	2,359.99	58.36	
14,744.00	88.81	0.04	11,892.06	2,275.71 N	967.45 W	506,790.11	725,553.85	2.47	2,361.98	58.35	
14,746.00	88.84	0.08	11,892.10	2,277.71 N	967.45 W	506,792.11	725,553.85	2.47	2,363.97	58.35	
14,748.00	88.87	0.12	11,892.14	2,279.71 N	967.44 W	506,794.11	725,553.86	2.47	2,365.96	58.35	
14,750.00	88.89	0.16	11,892.18	2,281.71 N	967.44 W	506,796.11	725,553.86	2.47	2,367.95	58.35	
14,752.00	88.92	0.21	11,892.22	2,283.71 N	967.43 W	506,798.11	725,553.87	2.47	2,369.94	58.35	
14,754.00	88.94	0.25	11,892.26	2,285.71 N	967.42 W	506,800.11	725,553.88	2.47	2,371.93	58.35	
14,756.00	88.97	0.29	11,892.29	2,287.71 N	967.41 W	506,802.11	725,553.89	2.47	2,373.92	58.35	
14,758.00	89.00	0.33	11,892.33	2,289.71 N	967.40 W	506,804.11	725,553.90	2.47	2,375.90	58.35	
14,760.00	89.02	0.38	11,892.36	2,291.71 N	967.39 W	506,806.11	725,553.91	2.47	2,377.89	58.35	
14,762.00	89.05	0.42	11,892.40	2,293.71 N	967.38 W	506,808.11	725,553.92	2.47	2,379.88	58.35	
14,764.00	89.07	0.46	11,892.43	2,295.71 N	967.36 W	506,810.11	725,553.94	2.47	2,381.87	58.35	
14,766.00	89.10	0.50	11,892.46	2,297.71 N	967.35 W	506,812.11	725,553.95	2.47	2,383.86	58.35	
14,768.00	89.13	0.54	11,892.49	2,299.71 N	967.33 W	506,814.11	725,553.97	2.47	2,385.84	58.35	
14,770.00	89.15	0.59	11,892.52	2,301.71 N	967.31 W	506,816.11	725,553.99	2.47	2,387.83	58.34	
14,772.00	89.18	0.63	11,892.55	2,303.71 N	967.29 W	506,818.11	725,554.01	2.47	2,389.82	58.34	
14,774.00	89.20	0.67	11,892.58	2,305.71 N	967.26 W	506,820.11	725,554.04	2.47	2,391.80	58.34	
14,776.00	89.23	0.71	11,892.61	2,307.71 N	967.24 W	506,822.11	725,554.06	2.47	2,393.79	58.34	
14,778.00	89.26	0.75	11,892.63	2,309.71 N	967.21 W	506,824.11	725,554.09	2.47	2,395.78	58.34	
14,780.00	89.28	0.80	11,892.66	2,311.71 N	967.19 W	506,826.11	725,554.11	2.47	2,397.76	58.34	
14,782.00	89.31	0.84	11,892.68	2,313.71 N	967.16 W	506,828.11	725,554.14	2.47	2,399.75	58.34	
14,784.00	89.33	0.88	11,892.71	2,315.71 N	967.13 W	506,830.11	725,554.17	2.47	2,401.74	58.34	
14,786.00	89.36	0.92	11,892.73	2,317.71 N	967.10 W	506,832.11	725,554.20	2.47	2,403.72	58.34	
14,788.00	89.39	0.96	11,892.75	2,319.71 N	967.06 W	506,834.11	725,554.24	2.47	2,405.71	58.34	
14,790.00	89.41	1.01	11,892.77	2,321.70 N	967.03 W	506,836.10	725,554.27	2.47	2,407.70	58.34	
14,792.00	89.44	1.05	11,892.79	2,323.70 N	966.99 W	506,838.10	725,554.31	2.47	2,409.68	58.34	
14,794.00	89.44	1.04	11,892.81	2,325.70 N	966.96 W	506,840.10	725,554.34	0.64	2,411.67	-63.52	
14,796.00	89.43	0.97	11,892.83	2,327.70 N	966.92 W	506,842.10	725,554.38	3.33	2,413.65	-102.61	
14,798.00	89.41	0.91	11,892.85	2,329.70 N	966.89 W	506,844.10	725,554.41	3.33	2,415.64	-102.61	
14,800.00	89.40	0.84	11,892.87	2,331.70 N	966.86 W	506,846.10	725,554.44	3.33	2,417.62	-102.61	
14,802.00	89.38	0.78	11,892.89	2,333.70 N	966.83 W	506,848.10	725,554.47	3.33	2,419.61	-102.61	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
14,804.00	89.37	0.71	11,892.92	2,335.70 N	966.80 W	506,850.10	725,554.50	3.33	2,421.60	-102.61	
14,806.00	89.36	0.65	11,892.94	2,337.70 N	966.78 W	506,852.10	725,554.52	3.33	2,423.59	-102.61	
14,808.00	89.34	0.58	11,892.96	2,339.70 N	966.76 W	506,854.10	725,554.54	3.33	2,425.57	-102.61	
14,810.00	89.33	0.52	11,892.98	2,341.70 N	966.74 W	506,856.10	725,554.56	3.33	2,427.56	-102.61	
14,812.00	89.31	0.45	11,893.01	2,343.70 N	966.72 W	506,858.10	725,554.58	3.33	2,429.55	-102.60	
14,814.00	89.30	0.39	11,893.03	2,345.70 N	966.71 W	506,860.10	725,554.59	3.33	2,431.54	-102.60	
14,816.00	89.28	0.32	11,893.06	2,347.70 N	966.70 W	506,862.10	725,554.60	3.33	2,433.52	-102.60	
14,818.00	89.27	0.26	11,893.08	2,349.70 N	966.69 W	506,864.10	725,554.61	3.33	2,435.51	-102.60	
14,820.00	89.25	0.19	11,893.11	2,351.70 N	966.68 W	506,866.10	725,554.62	3.33	2,437.50	-102.60	
14,822.00	89.24	0.13	11,893.13	2,353.70 N	966.67 W	506,868.10	725,554.63	3.33	2,439.49	-102.60	
14,824.00	89.22	0.06	11,893.16	2,355.70 N	966.67 W	506,870.10	725,554.63	3.33	2,441.48	-102.60	
14,826.00	89.21	360.00	11,893.19	2,357.70 N	966.67 W	506,872.10	725,554.63	3.33	2,443.47	-102.60	
14,828.00	89.20	359.93	11,893.22	2,359.70 N	966.67 W	506,874.10	725,554.63	3.33	2,445.46	-102.60	
14,830.00	89.18	359.87	11,893.25	2,361.70 N	966.67 W	506,876.10	725,554.63	3.33	2,447.45	-102.60	
14,832.00	89.17	359.80	11,893.27	2,363.70 N	966.68 W	506,878.10	725,554.62	3.33	2,449.44	-102.60	
14,834.00	89.15	359.74	11,893.30	2,365.70 N	966.69 W	506,880.10	725,554.61	3.33	2,451.43	-102.59	
14,836.00	89.14	359.67	11,893.33	2,367.70 N	966.70 W	506,882.10	725,554.60	3.33	2,453.42	-102.59	
14,838.00	89.12	359.61	11,893.36	2,369.70 N	966.71 W	506,884.10	725,554.59	3.33	2,455.41	-102.59	
14,840.00	89.11	359.54	11,893.39	2,371.70 N	966.72 W	506,886.10	725,554.58	3.33	2,457.40	-102.59	
14,842.00	89.09	359.48	11,893.43	2,373.70 N	966.74 W	506,888.10	725,554.56	3.33	2,459.39	-102.59	
14,844.00	89.08	359.41	11,893.46	2,375.70 N	966.76 W	506,890.10	725,554.54	3.33	2,461.38	-102.59	
14,846.00	89.06	359.35	11,893.49	2,377.70 N	966.78 W	506,892.10	725,554.52	3.33	2,463.38	-102.59	
14,848.00	89.05	359.28	11,893.52	2,379.70 N	966.81 W	506,894.10	725,554.49	3.33	2,465.37	-102.59	
14,850.00	89.04	359.22	11,893.56	2,381.70 N	966.83 W	506,896.10	725,554.47	3.33	2,467.36	-102.59	
14,852.00	89.02	359.15	11,893.59	2,383.70 N	966.86 W	506,898.10	725,554.44	3.33	2,469.35	-102.59	
14,854.00	89.01	359.09	11,893.62	2,385.70 N	966.89 W	506,900.10	725,554.41	3.33	2,471.34	-102.58	
14,856.00	88.99	359.02	11,893.66	2,387.69 N	966.93 W	506,902.09	725,554.37	3.33	2,473.34	-102.58	
14,858.00	88.98	358.96	11,893.70	2,389.69 N	966.96 W	506,904.09	725,554.34	3.33	2,475.33	-102.58	
14,860.00	88.96	358.89	11,893.73	2,391.69 N	967.00 W	506,906.09	725,554.30	3.33	2,477.32	-102.58	
14,862.00	88.95	358.83	11,893.77	2,393.69 N	967.04 W	506,908.09	725,554.26	3.33	2,479.31	-102.58	
14,864.00	88.93	358.76	11,893.80	2,395.69 N	967.08 W	506,910.09	725,554.22	3.33	2,481.31	-102.58	
14,866.00	88.92	358.70	11,893.84	2,397.69 N	967.12 W	506,912.09	725,554.18	3.33	2,483.30	-102.58	
14,868.00	88.91	358.63	11,893.88	2,399.69 N	967.17 W	506,914.09	725,554.13	3.33	2,485.29	-102.58	
14,870.00	88.89	358.57	11,893.92	2,401.69 N	967.22 W	506,916.09	725,554.08	3.33	2,487.29	-102.58	
14,872.00	88.88	358.50	11,893.96	2,403.69 N	967.27 W	506,918.09	725,554.03	3.33	2,489.28	-102.57	
14,874.00	88.86	358.44	11,894.00	2,405.69 N	967.32 W	506,920.09	725,553.98	3.33	2,491.28	-102.57	
14,876.00	88.85	358.37	11,894.04	2,407.69 N	967.38 W	506,922.09	725,553.92	3.33	2,493.27	-102.57	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
14,878.00	88.83	358.31	11,894.08	2,409.68 N	967.44 W	506,924.08	725,553.86	3.33	2,495.26	-102.57	
14,880.00	88.82	358.24	11,894.12	2,411.68 N	967.50 W	506,926.08	725,553.80	3.33	2,497.26	-102.57	
14,882.00	88.80	358.18	11,894.16	2,413.68 N	967.56 W	506,928.08	725,553.74	3.33	2,499.25	-102.57	
14,884.00	88.79	358.11	11,894.20	2,415.68 N	967.63 W	506,930.08	725,553.67	3.33	2,501.25	-102.57	
14,886.00	88.77	358.05	11,894.24	2,417.68 N	967.69 W	506,932.08	725,553.61	3.33	2,503.24	-102.56	
14,888.00	88.76	357.98	11,894.29	2,419.68 N	967.76 W	506,934.08	725,553.54	3.33	2,505.24	-102.56	
14,890.00	88.76	357.96	11,894.33	2,421.68 N	967.83 W	506,936.08	725,553.47	0.86	2,507.23	-105.08	
14,892.00	88.75	357.95	11,894.37	2,423.67 N	967.90 W	506,938.07	725,553.40	0.86	2,509.23	-105.08	
14,894.00	88.75	357.93	11,894.42	2,425.67 N	967.98 W	506,940.07	725,553.32	0.86	2,511.22	-105.08	
14,896.00	88.74	357.91	11,894.46	2,427.67 N	968.05 W	506,942.07	725,553.25	0.86	2,513.22	-105.08	
14,898.00	88.74	357.90	11,894.51	2,429.67 N	968.12 W	506,944.07	725,553.18	0.86	2,515.21	-105.08	
14,900.00	88.73	357.88	11,894.55	2,431.67 N	968.20 W	506,946.07	725,553.10	0.86	2,517.21	-105.08	
14,902.00	88.73	357.86	11,894.59	2,433.66 N	968.27 W	506,948.06	725,553.03	0.86	2,519.21	-105.08	
14,904.00	88.72	357.85	11,894.64	2,435.66 N	968.34 W	506,950.06	725,552.96	0.86	2,521.20	-105.08	
14,906.00	88.72	357.83	11,894.68	2,437.66 N	968.42 W	506,952.06	725,552.88	0.86	2,523.20	-105.08	
14,908.00	88.72	357.81	11,894.73	2,439.66 N	968.50 W	506,954.06	725,552.80	0.86	2,525.19	-105.08	
14,910.00	88.71	357.80	11,894.77	2,441.66 N	968.57 W	506,956.06	725,552.73	0.86	2,527.19	-105.08	
14,912.00	88.71	357.78	11,894.82	2,443.65 N	968.65 W	506,958.05	725,552.65	0.86	2,529.18	-105.08	
14,914.00	88.70	357.76	11,894.86	2,445.65 N	968.73 W	506,960.05	725,552.57	0.86	2,531.18	-105.08	
14,916.00	88.70	357.75	11,894.91	2,447.65 N	968.81 W	506,962.05	725,552.49	0.86	2,533.17	-105.08	
14,918.00	88.69	357.73	11,894.95	2,449.65 N	968.88 W	506,964.05	725,552.42	0.86	2,535.17	-105.08	
14,920.00	88.69	357.71	11,895.00	2,451.65 N	968.96 W	506,966.05	725,552.34	0.86	2,537.17	-105.08	
14,922.00	88.68	357.70	11,895.05	2,453.64 N	969.04 W	506,968.04	725,552.26	0.86	2,539.16	-105.08	
14,924.00	88.68	357.68	11,895.09	2,455.64 N	969.12 W	506,970.04	725,552.18	0.86	2,541.16	-105.08	
14,926.00	88.68	357.66	11,895.14	2,457.64 N	969.21 W	506,972.04	725,552.09	0.86	2,543.15	-105.07	
14,928.00	88.67	357.65	11,895.18	2,459.64 N	969.29 W	506,974.04	725,552.01	0.86	2,545.15	-105.07	
14,930.00	88.67	357.63	11,895.23	2,461.64 N	969.37 W	506,976.04	725,551.93	0.86	2,547.14	-105.07	
14,932.00	88.66	357.61	11,895.28	2,463.63 N	969.45 W	506,978.03	725,551.85	0.86	2,549.14	-105.07	
14,934.00	88.66	357.60	11,895.32	2,465.63 N	969.54 W	506,980.03	725,551.76	0.86	2,551.14	-105.07	
14,936.00	88.65	357.58	11,895.37	2,467.63 N	969.62 W	506,982.03	725,551.68	0.86	2,553.13	-105.07	
14,938.00	88.65	357.57	11,895.42	2,469.63 N	969.71 W	506,984.03	725,551.59	0.86	2,555.13	-105.07	
14,940.00	88.64	357.55	11,895.47	2,471.62 N	969.79 W	506,986.02	725,551.51	0.86	2,557.12	-105.07	
14,942.00	88.64	357.53	11,895.51	2,473.62 N	969.88 W	506,988.02	725,551.42	0.86	2,559.12	-105.07	
14,944.00	88.63	357.52	11,895.56	2,475.62 N	969.96 W	506,990.02	725,551.34	0.86	2,561.12	-105.07	
14,946.00	88.63	357.50	11,895.61	2,477.62 N	970.05 W	506,992.02	725,551.25	0.86	2,563.11	-105.07	
14,948.00	88.63	357.48	11,895.66	2,479.61 N	970.14 W	506,994.01	725,551.16	0.86	2,565.11	-105.07	
14,950.00	88.62	357.47	11,895.70	2,481.61 N	970.23 W	506,996.01	725,551.07	0.86	2,567.10	-105.07	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
14,952.00	88.62	357.45	11,895.75	2,483.61 N	970.31 W	506,998.01	725,550.99	0.86	2,569.10	-105.07	
14,954.00	88.61	357.43	11,895.80	2,485.61 N	970.40 W	507,000.01	725,550.90	0.86	2,571.10	-105.07	
14,956.00	88.61	357.42	11,895.85	2,487.60 N	970.49 W	507,002.00	725,550.81	0.86	2,573.09	-105.07	
14,958.00	88.60	357.40	11,895.90	2,489.60 N	970.58 W	507,004.00	725,550.72	0.86	2,575.09	-105.07	
14,960.00	88.60	357.38	11,895.95	2,491.60 N	970.67 W	507,006.00	725,550.63	0.86	2,577.09	-105.07	
14,962.00	88.59	357.37	11,896.00	2,493.60 N	970.77 W	507,008.00	725,550.53	0.86	2,579.08	-105.07	
14,964.00	88.59	357.35	11,896.04	2,495.59 N	970.86 W	507,009.99	725,550.44	0.86	2,581.08	-105.07	
14,966.00	88.59	357.33	11,896.09	2,497.59 N	970.95 W	507,011.99	725,550.35	0.86	2,583.07	-105.07	
14,968.00	88.58	357.32	11,896.14	2,499.59 N	971.04 W	507,013.99	725,550.26	0.86	2,585.07	-105.07	
14,970.00	88.58	357.30	11,896.19	2,501.58 N	971.14 W	507,015.98	725,550.16	0.86	2,587.07	-105.07	
14,972.00	88.57	357.28	11,896.24	2,503.58 N	971.23 W	507,017.98	725,550.07	0.86	2,589.06	-105.07	
14,974.00	88.57	357.27	11,896.29	2,505.58 N	971.33 W	507,019.98	725,549.97	0.86	2,591.06	-105.07	
14,976.00	88.56	357.25	11,896.34	2,507.58 N	971.42 W	507,021.98	725,549.88	0.86	2,593.06	-105.06	
14,978.00	88.56	357.23	11,896.39	2,509.57 N	971.52 W	507,023.97	725,549.78	0.86	2,595.05	-105.06	
14,980.00	88.55	357.22	11,896.44	2,511.57 N	971.62 W	507,025.97	725,549.68	0.86	2,597.05	-105.06	
14,982.00	88.55	357.20	11,896.49	2,513.57 N	971.71 W	507,027.97	725,549.59	0.86	2,599.05	-105.06	
14,984.00	88.57	357.22	11,896.54	2,515.56 N	971.81 W	507,029.96	725,549.49	1.22	2,601.04	43.96	
14,986.00	88.59	357.23	11,896.59	2,517.56 N	971.91 W	507,031.96	725,549.39	1.22	2,603.04	43.96	
14,988.00	88.60	357.25	11,896.64	2,519.56 N	972.00 W	507,033.96	725,549.30	1.22	2,605.04	43.96	
14,990.00	88.62	357.27	11,896.69	2,521.56 N	972.10 W	507,035.96	725,549.20	1.22	2,607.03	43.96	
14,992.00	88.64	357.28	11,896.74	2,523.55 N	972.20 W	507,037.95	725,549.10	1.22	2,609.03	43.96	
14,994.00	88.66	357.30	11,896.79	2,525.55 N	972.29 W	507,039.95	725,549.01	1.22	2,611.03	43.96	
14,996.00	88.67	357.32	11,896.83	2,527.55 N	972.38 W	507,041.95	725,548.92	1.22	2,613.02	43.96	
14,998.00	88.69	357.34	11,896.88	2,529.54 N	972.48 W	507,043.94	725,548.82	1.22	2,615.02	43.96	
15,000.00	88.71	357.35	11,896.92	2,531.54 N	972.57 W	507,045.94	725,548.73	1.22	2,617.02	43.96	
15,002.00	88.73	357.37	11,896.97	2,533.54 N	972.66 W	507,047.94	725,548.64	1.22	2,619.01	43.96	
15,004.00	88.74	357.39	11,897.01	2,535.54 N	972.75 W	507,049.94	725,548.55	1.22	2,621.01	43.96	
15,006.00	88.76	357.40	11,897.06	2,537.53 N	972.84 W	507,051.93	725,548.46	1.22	2,623.00	43.96	
15,008.00	88.78	357.42	11,897.10	2,539.53 N	972.93 W	507,053.93	725,548.37	1.22	2,625.00	43.96	
15,010.00	88.80	357.44	11,897.14	2,541.53 N	973.02 W	507,055.93	725,548.28	1.22	2,627.00	43.96	
15,012.00	88.81	357.45	11,897.18	2,543.53 N	973.11 W	507,057.93	725,548.19	1.22	2,628.99	43.96	
15,014.00	88.83	357.47	11,897.23	2,545.52 N	973.20 W	507,059.92	725,548.10	1.22	2,630.99	43.96	
15,016.00	88.85	357.49	11,897.27	2,547.52 N	973.29 W	507,061.92	725,548.01	1.22	2,632.99	43.96	
15,018.00	88.87	357.51	11,897.31	2,549.52 N	973.38 W	507,063.92	725,547.92	1.22	2,634.98	43.96	
15,020.00	88.88	357.52	11,897.34	2,551.52 N	973.46 W	507,065.92	725,547.84	1.22	2,636.98	43.96	
15,022.00	88.90	357.54	11,897.38	2,553.52 N	973.55 W	507,067.92	725,547.75	1.22	2,638.97	43.95	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
15,024.00	88.92	357.56	11,897.42	2,555.51 N	973.63 W	507,069.91	725,547.67	1.22	2,640.97	43.95	
15,026.00	88.94	357.57	11,897.46	2,557.51 N	973.72 W	507,071.91	725,547.58	1.22	2,642.97	43.95	
15,028.00	88.95	357.59	11,897.50	2,559.51 N	973.80 W	507,073.91	725,547.50	1.22	2,644.96	43.95	
15,030.00	88.97	357.61	11,897.53	2,561.51 N	973.89 W	507,075.91	725,547.41	1.22	2,646.96	43.95	
15,032.00	88.99	357.62	11,897.57	2,563.50 N	973.97 W	507,077.90	725,547.33	1.22	2,648.96	43.95	
15,034.00	89.01	357.64	11,897.60	2,565.50 N	974.05 W	507,079.90	725,547.25	1.22	2,650.95	43.95	
15,036.00	89.02	357.66	11,897.64	2,567.50 N	974.14 W	507,081.90	725,547.16	1.22	2,652.95	43.95	
15,038.00	89.04	357.67	11,897.67	2,569.50 N	974.22 W	507,083.90	725,547.08	1.22	2,654.94	43.95	
15,040.00	89.06	357.69	11,897.70	2,571.50 N	974.30 W	507,085.90	725,547.00	1.22	2,656.94	43.95	
15,042.00	89.08	357.71	11,897.74	2,573.49 N	974.38 W	507,087.89	725,546.92	1.22	2,658.94	43.95	
15,044.00	89.09	357.73	11,897.77	2,575.49 N	974.46 W	507,089.89	725,546.84	1.22	2,660.93	43.95	
15,046.00	89.11	357.74	11,897.80	2,577.49 N	974.54 W	507,091.89	725,546.76	1.22	2,662.93	43.95	
15,048.00	89.13	357.76	11,897.83	2,579.49 N	974.62 W	507,093.89	725,546.68	1.22	2,664.92	43.95	
15,050.00	89.15	357.78	11,897.86	2,581.49 N	974.69 W	507,095.89	725,546.61	1.22	2,666.92	43.95	
15,052.00	89.17	357.79	11,897.89	2,583.49 N	974.77 W	507,097.89	725,546.53	1.22	2,668.92	43.95	
15,054.00	89.18	357.81	11,897.92	2,585.48 N	974.85 W	507,099.88	725,546.45	1.22	2,670.91	43.95	
15,056.00	89.20	357.83	11,897.95	2,587.48 N	974.92 W	507,101.88	725,546.38	1.22	2,672.91	43.95	
15,058.00	89.22	357.84	11,897.97	2,589.48 N	975.00 W	507,103.88	725,546.30	1.22	2,674.90	43.95	
15,060.00	89.24	357.86	11,898.00	2,591.48 N	975.07 W	507,105.88	725,546.23	1.22	2,676.90	43.95	
15,062.00	89.25	357.88	11,898.03	2,593.48 N	975.15 W	507,107.88	725,546.15	1.22	2,678.89	43.95	
15,064.00	89.27	357.89	11,898.05	2,595.48 N	975.22 W	507,109.88	725,546.08	1.22	2,680.89	43.95	
15,066.00	89.29	357.91	11,898.08	2,597.47 N	975.30 W	507,111.87	725,546.00	1.22	2,682.89	43.95	
15,068.00	89.31	357.93	11,898.10	2,599.47 N	975.37 W	507,113.87	725,545.93	1.22	2,684.88	43.95	
15,070.00	89.32	357.95	11,898.13	2,601.47 N	975.44 W	507,115.87	725,545.86	1.22	2,686.88	43.95	
15,072.00	89.34	357.96	11,898.15	2,603.47 N	975.51 W	507,117.87	725,545.79	1.22	2,688.87	43.95	
15,074.00	89.36	357.98	11,898.17	2,605.47 N	975.58 W	507,119.87	725,545.72	1.22	2,690.87	43.95	
15,076.00	89.38	358.00	11,898.19	2,607.47 N	975.65 W	507,121.87	725,545.65	1.22	2,692.86	43.95	
15,078.00	89.39	358.01	11,898.22	2,609.47 N	975.72 W	507,123.87	725,545.58	1.22	2,694.86	43.95	
15,080.00	89.41	358.03	11,898.24	2,611.47 N	975.79 W	507,125.87	725,545.51	1.22	2,696.85	43.95	
15,082.00	89.43	358.05	11,898.26	2,613.46 N	975.86 W	507,127.86	725,545.44	1.22	2,698.85	43.95	
15,084.00	89.45	358.06	11,898.28	2,615.46 N	975.93 W	507,129.86	725,545.37	1.22	2,700.84	43.95	
15,086.00	89.46	358.08	11,898.30	2,617.46 N	975.99 W	507,131.86	725,545.31	1.22	2,702.84	43.95	
15,088.00	89.48	358.10	11,898.31	2,619.46 N	976.06 W	507,133.86	725,545.24	1.22	2,704.84	43.95	
15,090.00	89.50	358.12	11,898.33	2,621.46 N	976.13 W	507,135.86	725,545.17	1.22	2,706.83	43.95	
15,092.00	89.52	358.13	11,898.35	2,623.46 N	976.19 W	507,137.86	725,545.11	1.22	2,708.83	43.95	
15,094.00	89.53	358.15	11,898.37	2,625.46 N	976.26 W	507,139.86	725,545.04	1.22	2,710.82	43.95	
15,096.00	89.55	358.17	11,898.38	2,627.46 N	976.32 W	507,141.86	725,544.98	1.22	2,712.82	43.95	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
15,098.00	89.57	358.18	11,898.40	2,629.45 N	976.39 W	507,143.85	725,544.91	1.22	2,714.81	43.95	
15,100.00	89.59	358.20	11,898.41	2,631.45 N	976.45 W	507,145.85	725,544.85	1.22	2,716.81	43.95	
15,102.00	89.60	358.22	11,898.43	2,633.45 N	976.51 W	507,147.85	725,544.79	1.22	2,718.80	43.95	
15,104.00	89.62	358.23	11,898.44	2,635.45 N	976.57 W	507,149.85	725,544.73	1.22	2,720.80	43.95	
15,106.00	89.64	358.25	11,898.45	2,637.45 N	976.63 W	507,151.85	725,544.67	1.22	2,722.79	43.95	
15,108.00	89.66	358.27	11,898.46	2,639.45 N	976.70 W	507,153.85	725,544.60	1.22	2,724.79	43.95	
15,110.00	89.68	358.28	11,898.48	2,641.45 N	976.76 W	507,155.85	725,544.54	1.22	2,726.78	43.95	
15,112.00	89.69	358.30	11,898.49	2,643.45 N	976.82 W	507,157.85	725,544.48	1.22	2,728.78	43.95	
15,114.00	89.71	358.32	11,898.50	2,645.45 N	976.87 W	507,159.85	725,544.43	1.22	2,730.77	43.95	
15,116.00	89.73	358.34	11,898.51	2,647.45 N	976.93 W	507,161.85	725,544.37	1.22	2,732.77	43.94	
15,118.00	89.75	358.35	11,898.52	2,649.45 N	976.99 W	507,163.85	725,544.31	1.22	2,734.76	43.94	
15,120.00	89.76	358.37	11,898.53	2,651.44 N	977.05 W	507,165.84	725,544.25	1.22	2,736.75	43.94	
15,122.00	89.78	358.39	11,898.53	2,653.44 N	977.10 W	507,167.84	725,544.20	1.22	2,738.75	43.94	
15,124.00	89.80	358.40	11,898.54	2,655.44 N	977.16 W	507,169.84	725,544.14	1.22	2,740.74	43.94	
15,126.00	89.82	358.42	11,898.55	2,657.44 N	977.22 W	507,171.84	725,544.08	1.22	2,742.74	43.94	
15,128.00	89.83	358.44	11,898.55	2,659.44 N	977.27 W	507,173.84	725,544.03	1.22	2,744.73	43.94	
15,130.00	89.85	358.45	11,898.56	2,661.44 N	977.32 W	507,175.84	725,543.98	1.22	2,746.73	43.94	
15,132.00	89.87	358.47	11,898.56	2,663.44 N	977.38 W	507,177.84	725,543.92	1.22	2,748.72	43.94	
15,134.00	89.89	358.49	11,898.57	2,665.44 N	977.43 W	507,179.84	725,543.87	1.22	2,750.72	43.94	
15,136.00	89.90	358.51	11,898.57	2,667.44 N	977.48 W	507,181.84	725,543.82	1.22	2,752.71	43.94	
15,138.00	89.92	358.52	11,898.58	2,669.44 N	977.54 W	507,183.84	725,543.76	1.22	2,754.70	43.94	
15,140.00	89.94	358.54	11,898.58	2,671.44 N	977.59 W	507,185.84	725,543.71	1.22	2,756.70	43.94	
15,142.00	89.96	358.56	11,898.58	2,673.44 N	977.64 W	507,187.84	725,543.66	1.22	2,758.69	43.94	
15,144.00	89.97	358.57	11,898.58	2,675.44 N	977.69 W	507,189.84	725,543.61	1.22	2,760.69	43.94	
15,146.00	89.99	358.59	11,898.58	2,677.43 N	977.74 W	507,191.83	725,543.56	1.22	2,762.68	43.94	
15,148.00	90.01	358.61	11,898.58	2,679.43 N	977.79 W	507,193.83	725,543.51	1.22	2,764.68	43.94	
15,150.00	90.03	358.62	11,898.58	2,681.43 N	977.83 W	507,195.83	725,543.47	1.22	2,766.67	43.94	
15,152.00	90.04	358.64	11,898.58	2,683.43 N	977.88 W	507,197.83	725,543.42	1.22	2,768.66	43.94	
15,154.00	90.06	358.66	11,898.58	2,685.43 N	977.93 W	507,199.83	725,543.37	1.22	2,770.66	43.94	
15,156.00	90.08	358.67	11,898.58	2,687.43 N	977.98 W	507,201.83	725,543.32	1.22	2,772.65	43.94	
15,158.00	90.10	358.69	11,898.57	2,689.43 N	978.02 W	507,203.83	725,543.28	1.22	2,774.65	43.94	
15,160.00	90.11	358.71	11,898.57	2,691.43 N	978.07 W	507,205.83	725,543.23	1.22	2,776.64	43.94	
15,162.00	90.13	358.73	11,898.56	2,693.43 N	978.11 W	507,207.83	725,543.19	1.22	2,778.63	43.94	
15,164.00	90.15	358.74	11,898.56	2,695.43 N	978.16 W	507,209.83	725,543.14	1.22	2,780.63	43.94	
15,166.00	90.17	358.76	11,898.55	2,697.43 N	978.20 W	507,211.83	725,543.10	1.22	2,782.62	43.94	
15,168.00	90.18	358.78	11,898.55	2,699.43 N	978.24 W	507,213.83	725,543.06	1.22	2,784.61	43.94	
15,170.00	90.20	358.79	11,898.54	2,701.43 N	978.29 W	507,215.83	725,543.01	1.22	2,786.61	43.94	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
15,172.00	90.22	358.81	11,898.53	2,703.43 N	978.33 W	507,217.83	725,542.97	1.22	2,788.60	43.94	
15,174.00	90.26	358.84	11,898.52	2,705.43 N	978.37 W	507,219.83	725,542.93	2.59	2,790.59	30.34	
15,176.00	90.31	358.86	11,898.51	2,707.43 N	978.41 W	507,221.83	725,542.89	2.59	2,792.59	30.34	
15,178.00	90.35	358.89	11,898.50	2,709.43 N	978.45 W	507,223.83	725,542.85	2.59	2,794.58	30.34	
15,180.00	90.40	358.91	11,898.49	2,711.43 N	978.49 W	507,225.83	725,542.81	2.59	2,796.57	30.34	
15,182.00	90.44	358.94	11,898.48	2,713.43 N	978.52 W	507,227.83	725,542.78	2.59	2,798.57	30.34	
15,184.00	90.49	358.97	11,898.46	2,715.43 N	978.56 W	507,229.83	725,542.74	2.59	2,800.56	30.34	
15,186.00	90.53	358.99	11,898.44	2,717.43 N	978.60 W	507,231.83	725,542.70	2.59	2,802.55	30.34	
15,188.00	90.58	359.02	11,898.42	2,719.42 N	978.63 W	507,233.82	725,542.67	2.59	2,804.55	30.34	
15,190.00	90.62	359.05	11,898.40	2,721.42 N	978.66 W	507,235.82	725,542.64	2.59	2,806.54	30.34	
15,192.00	90.67	359.07	11,898.38	2,723.42 N	978.70 W	507,237.82	725,542.60	2.59	2,808.53	30.34	
15,194.00	90.71	359.10	11,898.35	2,725.42 N	978.73 W	507,239.82	725,542.57	2.59	2,810.52	30.34	
15,196.00	90.76	359.12	11,898.33	2,727.42 N	978.76 W	507,241.82	725,542.54	2.59	2,812.52	30.34	
15,198.00	90.80	359.15	11,898.30	2,729.42 N	978.79 W	507,243.82	725,542.51	2.59	2,814.51	30.34	
15,200.00	90.85	359.18	11,898.27	2,731.42 N	978.82 W	507,245.82	725,542.48	2.59	2,816.50	30.34	
15,202.00	90.89	359.20	11,898.24	2,733.42 N	978.85 W	507,247.82	725,542.45	2.59	2,818.49	30.34	
15,204.00	90.93	359.23	11,898.21	2,735.42 N	978.87 W	507,249.82	725,542.43	2.59	2,820.49	30.34	
15,206.00	90.98	359.25	11,898.18	2,737.42 N	978.90 W	507,251.82	725,542.40	2.59	2,822.48	30.34	
15,208.00	91.02	359.28	11,898.14	2,739.42 N	978.93 W	507,253.82	725,542.37	2.59	2,824.47	30.35	
15,210.00	91.07	359.31	11,898.11	2,741.42 N	978.95 W	507,255.82	725,542.35	2.59	2,826.46	30.35	
15,212.00	91.11	359.33	11,898.07	2,743.42 N	978.98 W	507,257.82	725,542.32	2.59	2,828.45	30.35	
15,214.00	91.16	359.36	11,898.03	2,745.42 N	979.00 W	507,259.82	725,542.30	2.59	2,830.44	30.35	
15,216.00	91.20	359.39	11,897.99	2,747.42 N	979.02 W	507,261.82	725,542.28	2.59	2,832.44	30.35	
15,218.00	91.25	359.41	11,897.94	2,749.42 N	979.04 W	507,263.82	725,542.26	2.59	2,834.43	30.35	
15,220.00	91.29	359.44	11,897.90	2,751.42 N	979.06 W	507,265.82	725,542.24	2.59	2,836.42	30.35	
15,222.00	91.34	359.46	11,897.85	2,753.42 N	979.08 W	507,267.82	725,542.22	2.59	2,838.41	30.35	
15,224.00	91.38	359.49	11,897.81	2,755.42 N	979.10 W	507,269.82	725,542.20	2.59	2,840.40	30.35	
15,226.00	91.43	359.52	11,897.76	2,757.42 N	979.12 W	507,271.82	725,542.18	2.59	2,842.39	30.35	
15,228.00	91.47	359.54	11,897.71	2,759.41 N	979.13 W	507,273.81	725,542.17	2.59	2,844.38	30.35	
15,230.00	91.52	359.57	11,897.65	2,761.41 N	979.15 W	507,275.81	725,542.15	2.59	2,846.37	30.35	
15,232.00	91.56	359.59	11,897.60	2,763.41 N	979.16 W	507,277.81	725,542.14	2.59	2,848.36	30.35	
15,234.00	91.61	359.62	11,897.55	2,765.41 N	979.18 W	507,279.81	725,542.12	2.59	2,850.35	30.35	
15,236.00	91.65	359.65	11,897.49	2,767.41 N	979.19 W	507,281.81	725,542.11	2.59	2,852.34	30.35	
15,238.00	91.69	359.67	11,897.43	2,769.41 N	979.20 W	507,283.81	725,542.10	2.59	2,854.33	30.35	
15,240.00	91.74	359.70	11,897.37	2,771.41 N	979.21 W	507,285.81	725,542.09	2.59	2,856.32	30.36	
15,242.00	91.78	359.73	11,897.31	2,773.41 N	979.22 W	507,287.81	725,542.08	2.59	2,858.31	30.36	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
15,244.00	91.83	359.75	11,897.25	2,775.41 N	979.23 W	507,289.81	725,542.07	2.59	2,860.30	30.36	
15,246.00	91.87	359.78	11,897.18	2,777.41 N	979.24 W	507,291.81	725,542.06	2.59	2,862.29	30.36	
15,248.00	91.92	359.80	11,897.12	2,779.41 N	979.25 W	507,293.81	725,542.05	2.59	2,864.28	30.36	
15,250.00	91.96	359.83	11,897.05	2,781.40 N	979.25 W	507,295.80	725,542.05	2.59	2,866.27	30.36	
15,252.00	92.01	359.86	11,896.98	2,783.40 N	979.26 W	507,297.80	725,542.04	2.59	2,868.26	30.36	
15,254.00	92.05	359.88	11,896.91	2,785.40 N	979.26 W	507,299.80	725,542.04	2.59	2,870.25	30.36	
15,256.00	92.10	359.91	11,896.84	2,787.40 N	979.27 W	507,301.80	725,542.03	2.59	2,872.24	30.36	
15,258.00	92.14	359.94	11,896.76	2,789.40 N	979.27 W	507,303.80	725,542.03	2.59	2,874.23	30.36	
15,260.00	92.19	359.96	11,896.69	2,791.40 N	979.27 W	507,305.80	725,542.03	2.59	2,876.21	30.36	
15,262.00	92.23	359.99	11,896.61	2,793.40 N	979.27 W	507,307.80	725,542.03	2.59	2,878.20	30.36	
15,264.00	92.28	0.01	11,896.53	2,795.39 N	979.27 W	507,309.79	725,542.03	2.59	2,880.19	30.37	
15,266.00	92.32	0.04	11,896.45	2,797.39 N	979.27 W	507,311.79	725,542.03	2.59	2,882.18	30.37	
15,268.00	92.30	0.07	11,896.37	2,799.39 N	979.27 W	507,313.79	725,542.03	1.78	2,884.17	115.94	
15,270.00	92.29	0.10	11,896.29	2,801.39 N	979.27 W	507,315.79	725,542.03	1.78	2,886.15	115.95	
15,272.00	92.27	0.14	11,896.21	2,803.39 N	979.26 W	507,317.79	725,542.04	1.78	2,888.14	115.95	
15,274.00	92.26	0.17	11,896.13	2,805.39 N	979.26 W	507,319.79	725,542.04	1.78	2,890.13	115.95	
15,276.00	92.24	0.20	11,896.05	2,807.39 N	979.25 W	507,321.79	725,542.05	1.78	2,892.12	115.95	
15,278.00	92.23	0.23	11,895.97	2,809.38 N	979.24 W	507,323.78	725,542.06	1.78	2,894.10	115.95	
15,280.00	92.21	0.26	11,895.90	2,811.38 N	979.23 W	507,325.78	725,542.07	1.78	2,896.09	115.95	
15,282.00	92.20	0.30	11,895.82	2,813.38 N	979.22 W	507,327.78	725,542.08	1.78	2,898.08	115.95	
15,284.00	92.18	0.33	11,895.74	2,815.38 N	979.21 W	507,329.78	725,542.09	1.78	2,900.07	115.95	
15,286.00	92.16	0.36	11,895.67	2,817.38 N	979.20 W	507,331.78	725,542.10	1.78	2,902.05	115.96	
15,288.00	92.15	0.39	11,895.59	2,819.38 N	979.19 W	507,333.78	725,542.11	1.78	2,904.04	115.96	
15,290.00	92.13	0.42	11,895.52	2,821.37 N	979.17 W	507,335.77	725,542.13	1.78	2,906.03	115.96	
15,292.00	92.12	0.46	11,895.44	2,823.37 N	979.16 W	507,337.77	725,542.14	1.78	2,908.01	115.96	
15,294.00	92.10	0.49	11,895.37	2,825.37 N	979.14 W	507,339.77	725,542.16	1.78	2,910.00	115.96	
15,296.00	92.09	0.52	11,895.30	2,827.37 N	979.12 W	507,341.77	725,542.18	1.78	2,911.99	115.96	
15,298.00	92.07	0.55	11,895.22	2,829.37 N	979.11 W	507,343.77	725,542.19	1.78	2,913.97	115.96	
15,300.00	92.06	0.58	11,895.15	2,831.37 N	979.09 W	507,345.77	725,542.21	1.78	2,915.96	115.96	
15,302.00	92.04	0.62	11,895.08	2,833.37 N	979.06 W	507,347.77	725,542.24	1.78	2,917.95	115.97	
15,304.00	92.02	0.65	11,895.01	2,835.37 N	979.04 W	507,349.77	725,542.26	1.78	2,919.93	115.97	
15,306.00	92.01	0.68	11,894.94	2,837.36 N	979.02 W	507,351.76	725,542.28	1.78	2,921.92	115.97	
15,308.00	91.99	0.71	11,894.87	2,839.36 N	979.00 W	507,353.76	725,542.30	1.78	2,923.90	115.97	
15,310.00	91.98	0.74	11,894.80	2,841.36 N	978.97 W	507,355.76	725,542.33	1.78	2,925.89	115.97	
15,312.00	91.96	0.78	11,894.73	2,843.36 N	978.94 W	507,357.76	725,542.36	1.78	2,927.88	115.97	
15,314.00	91.95	0.81	11,894.66	2,845.36 N	978.92 W	507,359.76	725,542.38	1.78	2,929.86	115.97	
15,316.00	91.93	0.84	11,894.60	2,847.36 N	978.89 W	507,361.76	725,542.41	1.78	2,931.85	115.97	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
15,318.00	91.92	0.87	11,894.53	2,849.36 N	978.86 W	507,363.76	725,542.44	1.78	2,933.83	115.97	
15,320.00	91.90	0.90	11,894.46	2,851.35 N	978.83 W	507,365.75	725,542.47	1.78	2,935.82	115.98	
15,322.00	91.88	0.94	11,894.40	2,853.35 N	978.79 W	507,367.75	725,542.51	1.78	2,937.80	115.98	
15,324.00	91.87	0.97	11,894.33	2,855.35 N	978.76 W	507,369.75	725,542.54	1.78	2,939.79	115.98	
15,326.00	91.85	1.00	11,894.27	2,857.35 N	978.73 W	507,371.75	725,542.57	1.78	2,941.77	115.98	
15,328.00	91.84	1.03	11,894.20	2,859.35 N	978.69 W	507,373.75	725,542.61	1.78	2,943.76	115.98	
15,330.00	91.82	1.06	11,894.14	2,861.35 N	978.65 W	507,375.75	725,542.65	1.78	2,945.74	115.98	
15,332.00	91.81	1.10	11,894.07	2,863.35 N	978.62 W	507,377.75	725,542.68	1.78	2,947.73	115.98	
15,334.00	91.79	1.13	11,894.01	2,865.34 N	978.58 W	507,379.74	725,542.72	1.78	2,949.71	115.98	
15,336.00	91.77	1.16	11,893.95	2,867.34 N	978.54 W	507,381.74	725,542.76	1.78	2,951.69	115.98	
15,338.00	91.76	1.19	11,893.89	2,869.34 N	978.50 W	507,383.74	725,542.80	1.78	2,953.68	115.98	
15,340.00	91.74	1.22	11,893.83	2,871.34 N	978.45 W	507,385.74	725,542.85	1.78	2,955.66	115.99	
15,342.00	91.73	1.26	11,893.77	2,873.34 N	978.41 W	507,387.74	725,542.89	1.78	2,957.65	115.99	
15,344.00	91.71	1.29	11,893.71	2,875.34 N	978.37 W	507,389.74	725,542.93	1.78	2,959.63	115.99	
15,346.00	91.70	1.32	11,893.65	2,877.34 N	978.32 W	507,391.74	725,542.98	1.78	2,961.61	115.99	
15,348.00	91.68	1.35	11,893.59	2,879.34 N	978.27 W	507,393.74	725,543.03	1.78	2,963.60	115.99	
15,350.00	91.67	1.38	11,893.53	2,881.33 N	978.23 W	507,395.73	725,543.07	1.78	2,965.58	115.99	
15,352.00	91.65	1.42	11,893.47	2,883.33 N	978.18 W	507,397.73	725,543.12	1.78	2,967.57	115.99	
15,354.00	91.63	1.45	11,893.41	2,885.33 N	978.13 W	507,399.73	725,543.17	1.78	2,969.55	115.99	
15,356.00	91.62	1.48	11,893.36	2,887.33 N	978.08 W	507,401.73	725,543.22	1.78	2,971.53	115.99	
15,358.00	91.60	1.51	11,893.30	2,889.33 N	978.03 W	507,403.73	725,543.27	1.78	2,973.51	115.99	
15,360.00	91.59	1.54	11,893.24	2,891.33 N	977.97 W	507,405.73	725,543.33	1.78	2,975.50	115.99	
15,362.00	91.58	1.56	11,893.19	2,893.32 N	977.92 W	507,407.72	725,543.38	1.01	2,977.48	100.87	
15,364.00	91.59	1.57	11,893.13	2,895.32 N	977.86 W	507,409.72	725,543.44	0.55	2,979.46	43.43	
15,366.00	91.60	1.58	11,893.08	2,897.32 N	977.81 W	507,411.72	725,543.49	0.55	2,981.45	43.43	
15,368.00	91.61	1.59	11,893.02	2,899.32 N	977.75 W	507,413.72	725,543.55	0.55	2,983.43	43.43	
15,370.00	91.62	1.59	11,892.97	2,901.32 N	977.70 W	507,415.72	725,543.60	0.55	2,985.41	43.43	
15,372.00	91.62	1.60	11,892.91	2,903.32 N	977.64 W	507,417.72	725,543.66	0.55	2,987.39	43.43	
15,374.00	91.63	1.61	11,892.85	2,905.32 N	977.59 W	507,419.72	725,543.71	0.55	2,989.38	43.43	
15,376.00	91.64	1.62	11,892.80	2,907.31 N	977.53 W	507,421.71	725,543.77	0.55	2,991.36	43.43	
15,378.00	91.65	1.62	11,892.74	2,909.31 N	977.47 W	507,423.71	725,543.83	0.55	2,993.34	43.43	
15,380.00	91.66	1.63	11,892.68	2,911.31 N	977.42 W	507,425.71	725,543.88	0.55	2,995.32	43.43	
15,382.00	91.66	1.64	11,892.62	2,913.31 N	977.36 W	507,427.71	725,543.94	0.55	2,997.30	43.43	
15,384.00	91.67	1.65	11,892.56	2,915.31 N	977.30 W	507,429.71	725,544.00	0.55	2,999.29	43.44	
15,386.00	91.68	1.65	11,892.51	2,917.31 N	977.24 W	507,431.71	725,544.06	0.55	3,001.27	43.44	
15,388.00	91.69	1.66	11,892.45	2,919.30 N	977.19 W	507,433.70	725,544.11	0.55	3,003.25	43.44	
15,390.00	91.70	1.67	11,892.39	2,921.30 N	977.13 W	507,435.70	725,544.17	0.55	3,005.23	43.44	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
15,392.00	91.70	1.68	11,892.33	2,923.30 N	977.07 W	507,437.70	725,544.23	0.55	3,007.22	43.44	
15,394.00	91.71	1.69	11,892.27	2,925.30 N	977.01 W	507,439.70	725,544.29	0.55	3,009.20	43.44	
15,396.00	91.72	1.69	11,892.21	2,927.30 N	976.95 W	507,441.70	725,544.35	0.55	3,011.18	43.44	
15,398.00	91.73	1.70	11,892.15	2,929.30 N	976.89 W	507,443.70	725,544.41	0.55	3,013.16	43.44	
15,400.00	91.74	1.71	11,892.09	2,931.29 N	976.83 W	507,445.69	725,544.47	0.55	3,015.14	43.44	
15,402.00	91.74	1.72	11,892.03	2,933.29 N	976.77 W	507,447.69	725,544.53	0.55	3,017.13	43.44	
15,404.00	91.75	1.72	11,891.97	2,935.29 N	976.71 W	507,449.69	725,544.59	0.55	3,019.11	43.44	
15,406.00	91.76	1.73	11,891.91	2,937.29 N	976.65 W	507,451.69	725,544.65	0.55	3,021.09	43.44	
15,408.00	91.77	1.74	11,891.84	2,939.29 N	976.59 W	507,453.69	725,544.71	0.55	3,023.07	43.44	
15,410.00	91.78	1.75	11,891.78	2,941.28 N	976.53 W	507,455.68	725,544.77	0.55	3,025.05	43.44	
15,412.00	91.78	1.75	11,891.72	2,943.28 N	976.47 W	507,457.68	725,544.83	0.55	3,027.03	43.44	
15,414.00	91.79	1.76	11,891.66	2,945.28 N	976.41 W	507,459.68	725,544.89	0.55	3,029.02	43.44	
15,416.00	91.80	1.77	11,891.60	2,947.28 N	976.35 W	507,461.68	725,544.95	0.55	3,031.00	43.44	
15,418.00	91.81	1.78	11,891.53	2,949.28 N	976.29 W	507,463.68	725,545.01	0.55	3,032.98	43.44	
15,420.00	91.82	1.78	11,891.47	2,951.27 N	976.22 W	507,465.67	725,545.08	0.55	3,034.96	43.44	
15,422.00	91.82	1.79	11,891.41	2,953.27 N	976.16 W	507,467.67	725,545.14	0.55	3,036.94	43.44	
15,424.00	91.83	1.80	11,891.34	2,955.27 N	976.10 W	507,469.67	725,545.20	0.55	3,038.92	43.44	
15,426.00	91.84	1.81	11,891.28	2,957.27 N	976.04 W	507,471.67	725,545.26	0.55	3,040.90	43.44	
15,428.00	91.85	1.81	11,891.21	2,959.27 N	975.97 W	507,473.67	725,545.33	0.55	3,042.89	43.44	
15,430.00	91.86	1.82	11,891.15	2,961.26 N	975.91 W	507,475.66	725,545.39	0.55	3,044.87	43.44	
15,432.00	91.86	1.83	11,891.08	2,963.26 N	975.85 W	507,477.66	725,545.45	0.55	3,046.85	43.44	
15,434.00	91.87	1.84	11,891.02	2,965.26 N	975.78 W	507,479.66	725,545.52	0.55	3,048.83	43.44	
15,436.00	91.88	1.84	11,890.95	2,967.26 N	975.72 W	507,481.66	725,545.58	0.55	3,050.81	43.44	
15,438.00	91.89	1.85	11,890.89	2,969.26 N	975.65 W	507,483.66	725,545.65	0.55	3,052.79	43.44	
15,440.00	91.90	1.86	11,890.82	2,971.25 N	975.59 W	507,485.65	725,545.71	0.55	3,054.77	43.44	
15,442.00	91.90	1.87	11,890.75	2,973.25 N	975.52 W	507,487.65	725,545.78	0.55	3,056.75	43.44	
15,444.00	91.91	1.87	11,890.69	2,975.25 N	975.46 W	507,489.65	725,545.84	0.55	3,058.73	43.44	
15,446.00	91.92	1.88	11,890.62	2,977.25 N	975.39 W	507,491.65	725,545.91	0.55	3,060.72	43.44	
15,448.00	91.93	1.89	11,890.55	2,979.25 N	975.33 W	507,493.65	725,545.97	0.55	3,062.70	43.44	
15,450.00	91.94	1.90	11,890.49	2,981.24 N	975.26 W	507,495.64	725,546.04	0.55	3,064.68	43.44	
15,452.00	91.94	1.90	11,890.42	2,983.24 N	975.20 W	507,497.64	725,546.10	0.55	3,066.66	43.44	
15,454.00	91.95	1.91	11,890.35	2,985.24 N	975.13 W	507,499.64	725,546.17	0.55	3,068.64	43.44	
15,456.00	91.96	1.92	11,890.28	2,987.24 N	975.06 W	507,501.64	725,546.24	0.55	3,070.62	43.44	
15,458.00	91.93	1.88	11,890.22	2,989.23 N	975.00 W	507,503.63	725,546.30	2.37	3,072.60	-130.90	
15,460.00	91.90	1.85	11,890.15	2,991.23 N	974.93 W	507,505.63	725,546.37	2.37	3,074.58	-130.90	
15,462.00	91.87	1.81	11,890.08	2,993.23 N	974.87 W	507,507.63	725,546.43	2.37	3,076.56	-130.90	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
15,464.00	91.84	1.78	11,890.02	2,995.23 N	974.80 W	507,509.63	725,546.50	2.37	3,078.54	-130.90	
15,466.00	91.81	1.74	11,889.95	2,997.23 N	974.74 W	507,511.63	725,546.56	2.37	3,080.53	-130.90	
15,468.00	91.77	1.71	11,889.89	2,999.22 N	974.68 W	507,513.62	725,546.62	2.37	3,082.51	-130.90	
15,470.00	91.74	1.67	11,889.83	3,001.22 N	974.62 W	507,515.62	725,546.68	2.37	3,084.49	-130.90	
15,472.00	91.71	1.63	11,889.77	3,003.22 N	974.57 W	507,517.62	725,546.73	2.37	3,086.47	-130.90	
15,474.00	91.68	1.60	11,889.71	3,005.22 N	974.51 W	507,519.62	725,546.79	2.37	3,088.45	-130.91	
15,476.00	91.65	1.56	11,889.65	3,007.22 N	974.45 W	507,521.62	725,546.85	2.37	3,090.44	-130.91	
15,478.00	91.62	1.53	11,889.60	3,009.22 N	974.40 W	507,523.62	725,546.90	2.37	3,092.42	-130.91	
15,480.00	91.59	1.49	11,889.54	3,011.21 N	974.35 W	507,525.61	725,546.95	2.37	3,094.40	-130.91	
15,482.00	91.56	1.45	11,889.48	3,013.21 N	974.30 W	507,527.61	725,547.00	2.37	3,096.38	-130.91	
15,484.00	91.53	1.42	11,889.43	3,015.21 N	974.25 W	507,529.61	725,547.05	2.37	3,098.37	-130.91	
15,486.00	91.50	1.38	11,889.38	3,017.21 N	974.20 W	507,531.61	725,547.10	2.37	3,100.35	-130.91	
15,488.00	91.46	1.35	11,889.33	3,019.21 N	974.15 W	507,533.61	725,547.15	2.37	3,102.34	-130.91	
15,490.00	91.43	1.31	11,889.28	3,021.21 N	974.10 W	507,535.61	725,547.20	2.37	3,104.32	-130.91	
15,492.00	91.40	1.28	11,889.23	3,023.21 N	974.06 W	507,537.61	725,547.24	2.37	3,106.30	-130.91	
15,494.00	91.37	1.24	11,889.18	3,025.21 N	974.01 W	507,539.61	725,547.29	2.37	3,108.29	-130.91	
15,496.00	91.34	1.20	11,889.13	3,027.20 N	973.97 W	507,541.60	725,547.33	2.37	3,110.27	-130.92	
15,498.00	91.31	1.17	11,889.08	3,029.20 N	973.93 W	507,543.60	725,547.37	2.37	3,112.26	-130.92	
15,500.00	91.28	1.13	11,889.04	3,031.20 N	973.89 W	507,545.60	725,547.41	2.37	3,114.24	-130.92	
15,502.00	91.25	1.10	11,889.00	3,033.20 N	973.85 W	507,547.60	725,547.45	2.37	3,116.23	-130.92	
15,504.00	91.22	1.06	11,888.95	3,035.20 N	973.81 W	507,549.60	725,547.49	2.37	3,118.21	-130.92	
15,506.00	91.19	1.03	11,888.91	3,037.20 N	973.78 W	507,551.60	725,547.52	2.37	3,120.20	-130.92	
15,508.00	91.15	0.99	11,888.87	3,039.20 N	973.74 W	507,553.60	725,547.56	2.37	3,122.18	-130.92	
15,510.00	91.12	0.95	11,888.83	3,041.20 N	973.71 W	507,555.60	725,547.59	2.37	3,124.17	-130.92	
15,512.00	91.09	0.92	11,888.79	3,043.20 N	973.68 W	507,557.60	725,547.62	2.37	3,126.15	-130.92	
15,514.00	91.06	0.88	11,888.75	3,045.20 N	973.64 W	507,559.60	725,547.66	2.37	3,128.14	-130.92	
15,516.00	91.03	0.85	11,888.72	3,047.20 N	973.61 W	507,561.60	725,547.69	2.37	3,130.13	-130.92	
15,518.00	91.00	0.81	11,888.68	3,049.20 N	973.58 W	507,563.60	725,547.72	2.37	3,132.11	-130.92	
15,520.00	90.97	0.78	11,888.65	3,051.20 N	973.56 W	507,565.60	725,547.74	2.37	3,134.10	-130.92	
15,522.00	90.94	0.74	11,888.61	3,053.20 N	973.53 W	507,567.60	725,547.77	2.37	3,136.08	-130.93	
15,524.00	90.91	0.70	11,888.58	3,055.19 N	973.51 W	507,569.59	725,547.79	2.37	3,138.07	-130.93	
15,526.00	90.88	0.67	11,888.55	3,057.19 N	973.48 W	507,571.59	725,547.82	2.37	3,140.06	-130.93	
15,528.00	90.84	0.63	11,888.52	3,059.19 N	973.46 W	507,573.59	725,547.84	2.37	3,142.05	-130.93	
15,530.00	90.81	0.60	11,888.49	3,061.19 N	973.44 W	507,575.59	725,547.86	2.37	3,144.03	-130.93	
15,532.00	90.78	0.56	11,888.46	3,063.19 N	973.42 W	507,577.59	725,547.88	2.37	3,146.02	-130.93	
15,534.00	90.75	0.52	11,888.44	3,065.19 N	973.40 W	507,579.59	725,547.90	2.37	3,148.01	-130.93	
15,536.00	90.72	0.49	11,888.41	3,067.19 N	973.38 W	507,581.59	725,547.92	2.37	3,149.99	-130.93	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
15,538.00	90.69	0.45	11,888.39	3,069.19 N	973.36 W	507,583.59	725,547.94	2.37	3,151.98	-130.93	
15,540.00	90.66	0.42	11,888.36	3,071.19 N	973.35 W	507,585.59	725,547.95	2.37	3,153.97	-130.93	
15,542.00	90.63	0.38	11,888.34	3,073.19 N	973.34 W	507,587.59	725,547.96	2.37	3,155.96	-130.93	
15,544.00	90.60	0.35	11,888.32	3,075.19 N	973.32 W	507,589.59	725,547.98	2.37	3,157.95	-130.93	
15,546.00	90.56	0.31	11,888.30	3,077.19 N	973.31 W	507,591.59	725,547.99	2.37	3,159.94	-130.93	
15,548.00	90.53	0.27	11,888.28	3,079.19 N	973.30 W	507,593.59	725,548.00	2.37	3,161.92	-130.93	
15,550.00	90.50	0.24	11,888.26	3,081.19 N	973.29 W	507,595.59	725,548.01	2.37	3,163.91	-130.93	
15,552.00	90.47	0.20	11,888.25	3,083.19 N	973.28 W	507,597.59	725,548.02	2.37	3,165.90	-130.93	
15,554.00	90.44	0.17	11,888.23	3,085.19 N	973.28 W	507,599.59	725,548.02	2.37	3,167.89	-130.93	
15,556.00	90.41	0.13	11,888.21	3,087.19 N	973.27 W	507,601.59	725,548.03	2.37	3,169.88	-130.93	
15,558.00	90.38	0.10	11,888.20	3,089.19 N	973.27 W	507,603.59	725,548.03	2.37	3,171.87	-130.93	
15,560.00	90.35	0.06	11,888.19	3,091.19 N	973.27 W	507,605.59	725,548.03	2.37	3,173.86	-130.93	
15,562.00	90.32	0.02	11,888.18	3,093.19 N	973.26 W	507,607.59	725,548.04	2.37	3,175.85	-130.93	
15,564.00	90.29	359.99	11,888.17	3,095.19 N	973.26 W	507,609.59	725,548.04	2.37	3,177.84	-130.93	
15,566.00	90.25	359.95	11,888.16	3,097.19 N	973.27 W	507,611.59	725,548.03	2.37	3,179.83	-130.93	
15,568.00	90.22	359.92	11,888.15	3,099.19 N	973.27 W	507,613.59	725,548.03	2.37	3,181.82	-130.93	
15,570.00	90.19	359.88	11,888.14	3,101.19 N	973.27 W	507,615.59	725,548.03	2.37	3,183.81	-130.93	
15,572.00	90.16	359.85	11,888.13	3,103.19 N	973.28 W	507,617.59	725,548.02	2.37	3,185.80	-130.93	
15,574.00	90.13	359.81	11,888.13	3,105.19 N	973.28 W	507,619.59	725,548.02	2.37	3,187.79	-130.93	
15,576.00	90.10	359.77	11,888.13	3,107.19 N	973.29 W	507,621.59	725,548.01	2.37	3,189.78	-130.93	
15,578.00	90.07	359.74	11,888.12	3,109.19 N	973.30 W	507,623.59	725,548.00	2.37	3,191.77	-130.93	
15,580.00	90.04	359.70	11,888.12	3,111.19 N	973.31 W	507,625.59	725,547.99	2.37	3,193.76	-130.93	
15,582.00	90.01	359.67	11,888.12	3,113.19 N	973.32 W	507,627.59	725,547.98	2.37	3,195.75	-130.93	
15,584.00	89.98	359.63	11,888.12	3,115.19 N	973.33 W	507,629.59	725,547.97	2.37	3,197.74	-130.93	
15,586.00	89.94	359.59	11,888.12	3,117.19 N	973.34 W	507,631.59	725,547.96	2.37	3,199.73	-130.93	
15,588.00	89.91	359.56	11,888.12	3,119.19 N	973.36 W	507,633.59	725,547.94	2.37	3,201.72	-130.93	
15,590.00	89.88	359.52	11,888.13	3,121.19 N	973.38 W	507,635.59	725,547.92	2.37	3,203.71	-130.93	
15,592.00	89.85	359.49	11,888.13	3,123.19 N	973.39 W	507,637.59	725,547.91	2.37	3,205.71	-130.93	
15,594.00	89.82	359.45	11,888.14	3,125.19 N	973.41 W	507,639.59	725,547.89	2.37	3,207.70	-130.93	
15,596.00	89.79	359.42	11,888.15	3,127.19 N	973.43 W	507,641.59	725,547.87	2.37	3,209.69	-130.93	
15,598.00	89.76	359.38	11,888.15	3,129.19 N	973.45 W	507,643.59	725,547.85	2.37	3,211.68	-130.93	
15,600.00	89.73	359.34	11,888.16	3,131.19 N	973.47 W	507,645.59	725,547.83	2.37	3,213.67	-130.93	
15,602.00	89.70	359.31	11,888.17	3,133.19 N	973.50 W	507,647.59	725,547.80	2.37	3,215.66	-130.93	
15,604.00	89.67	359.27	11,888.18	3,135.19 N	973.52 W	507,649.59	725,547.78	2.37	3,217.66	-130.93	
15,606.00	89.63	359.24	11,888.20	3,137.19 N	973.55 W	507,651.59	725,547.75	2.37	3,219.65	-130.93	
15,608.00	89.60	359.20	11,888.21	3,139.19 N	973.58 W	507,653.59	725,547.72	2.37	3,221.64	-130.93	
15,610.00	89.57	359.17	11,888.22	3,141.19 N	973.60 W	507,655.59	725,547.70	2.37	3,223.63	-130.93	

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Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
15,612.00	89.54	359.13	11,888.24	3,143.19 N	973.63 W	507,657.59	725,547.67	2.37	3,225.63	-130.93	
15,614.00	89.51	359.09	11,888.25	3,145.19 N	973.66 W	507,659.59	725,547.64	2.37	3,227.62	-130.93	
15,616.00	89.48	359.06	11,888.27	3,147.19 N	973.70 W	507,661.59	725,547.60	2.37	3,229.61	-130.93	
15,618.00	89.45	359.02	11,888.29	3,149.19 N	973.73 W	507,663.59	725,547.57	2.37	3,231.60	-130.93	
15,620.00	89.42	358.99	11,888.31	3,151.19 N	973.76 W	507,665.59	725,547.54	2.37	3,233.60	-130.93	
15,622.00	89.39	358.95	11,888.33	3,153.19 N	973.80 W	507,667.59	725,547.50	2.37	3,235.59	-130.93	
15,624.00	89.36	358.92	11,888.35	3,155.19 N	973.84 W	507,669.59	725,547.46	2.37	3,237.58	-130.93	
15,626.00	89.32	358.88	11,888.38	3,157.19 N	973.88 W	507,671.59	725,547.42	2.37	3,239.58	-130.93	
15,628.00	89.29	358.84	11,888.40	3,159.19 N	973.92 W	507,673.59	725,547.38	2.37	3,241.57	-130.93	
15,630.00	89.26	358.81	11,888.43	3,161.19 N	973.96 W	507,675.59	725,547.34	2.37	3,243.56	-130.93	
15,632.00	89.23	358.77	11,888.45	3,163.18 N	974.00 W	507,677.58	725,547.30	2.37	3,245.56	-130.93	
15,634.00	89.20	358.74	11,888.48	3,165.18 N	974.04 W	507,679.58	725,547.26	2.37	3,247.55	-130.93	
15,636.00	89.17	358.70	11,888.51	3,167.18 N	974.09 W	507,681.58	725,547.21	2.37	3,249.54	-130.93	
15,638.00	89.14	358.67	11,888.54	3,169.18 N	974.13 W	507,683.58	725,547.17	2.37	3,251.54	-130.93	
15,640.00	89.11	358.63	11,888.57	3,171.18 N	974.18 W	507,685.58	725,547.12	2.37	3,253.53	-130.93	
15,642.00	89.08	358.59	11,888.60	3,173.18 N	974.23 W	507,687.58	725,547.07	2.37	3,255.52	-130.93	
15,644.00	89.05	358.56	11,888.63	3,175.18 N	974.28 W	507,689.58	725,547.02	2.37	3,257.52	-130.93	
15,646.00	89.03	358.53	11,888.67	3,177.18 N	974.33 W	507,691.58	725,546.97	1.85	3,259.51	-119.32	
15,648.00	89.02	358.50	11,888.70	3,179.18 N	974.38 W	507,693.58	725,546.92	1.47	3,261.51	-100.36	
15,650.00	89.02	358.47	11,888.73	3,181.18 N	974.43 W	507,695.58	725,546.87	1.47	3,263.50	-100.36	
15,652.00	89.01	358.44	11,888.77	3,183.18 N	974.49 W	507,697.58	725,546.81	1.47	3,265.49	-100.35	
15,654.00	89.01	358.41	11,888.80	3,185.18 N	974.54 W	507,699.58	725,546.76	1.47	3,267.49	-100.35	
15,656.00	89.00	358.38	11,888.84	3,187.17 N	974.60 W	507,701.57	725,546.70	1.47	3,269.48	-100.35	
15,658.00	89.00	358.35	11,888.87	3,189.17 N	974.66 W	507,703.57	725,546.64	1.47	3,271.48	-100.35	
15,660.00	88.99	358.32	11,888.91	3,191.17 N	974.71 W	507,705.57	725,546.59	1.47	3,273.47	-100.35	
15,662.00	88.99	358.29	11,888.94	3,193.17 N	974.77 W	507,707.57	725,546.53	1.47	3,275.47	-100.35	
15,664.00	88.98	358.27	11,888.98	3,195.17 N	974.83 W	507,709.57	725,546.47	1.47	3,277.46	-100.35	
15,666.00	88.97	358.24	11,889.02	3,197.17 N	974.89 W	507,711.57	725,546.41	1.47	3,279.46	-100.35	
15,668.00	88.97	358.21	11,889.05	3,199.17 N	974.96 W	507,713.57	725,546.34	1.47	3,281.45	-100.35	
15,670.00	88.96	358.18	11,889.09	3,201.17 N	975.02 W	507,715.57	725,546.28	1.47	3,283.44	-100.35	
15,672.00	88.96	358.15	11,889.12	3,203.16 N	975.08 W	507,717.56	725,546.22	1.47	3,285.44	-100.35	
15,674.00	88.95	358.12	11,889.16	3,205.16 N	975.15 W	507,719.56	725,546.15	1.47	3,287.43	-100.35	
15,676.00	88.95	358.09	11,889.20	3,207.16 N	975.21 W	507,721.56	725,546.09	1.47	3,289.43	-100.35	
15,678.00	88.94	358.06	11,889.23	3,209.16 N	975.28 W	507,723.56	725,546.02	1.47	3,291.42	-100.35	
15,680.00	88.94	358.04	11,889.27	3,211.16 N	975.35 W	507,725.56	725,545.95	1.47	3,293.42	-100.35	
15,682.00	88.93	358.01	11,889.31	3,213.16 N	975.42 W	507,727.56	725,545.88	1.47	3,295.41	-100.35	



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Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
15,684.00	88.93	357.98	11,889.34	3,215.16 N	975.49 W	507,729.56	725,545.81	1.47	3,297.41	-100.35	
15,686.00	88.92	357.95	11,889.38	3,217.15 N	975.56 W	507,731.55	725,545.74	1.47	3,299.41	-100.35	
15,688.00	88.92	357.92	11,889.42	3,219.15 N	975.63 W	507,733.55	725,545.67	1.47	3,301.40	-100.35	
15,690.00	88.91	357.89	11,889.46	3,221.15 N	975.71 W	507,735.55	725,545.59	1.47	3,303.40	-100.34	
15,692.00	88.91	357.86	11,889.50	3,223.15 N	975.78 W	507,737.55	725,545.52	1.47	3,305.39	-100.34	
15,694.00	88.90	357.83	11,889.53	3,225.15 N	975.85 W	507,739.55	725,545.45	1.47	3,307.39	-100.34	
15,696.00	88.90	357.80	11,889.57	3,227.14 N	975.93 W	507,741.54	725,545.37	1.47	3,309.38	-100.34	
15,698.00	88.89	357.78	11,889.61	3,229.14 N	976.01 W	507,743.54	725,545.29	1.47	3,311.38	-100.34	
15,700.00	88.89	357.75	11,889.65	3,231.14 N	976.09 W	507,745.54	725,545.21	1.47	3,313.37	-100.34	
15,702.00	88.88	357.72	11,889.69	3,233.14 N	976.17 W	507,747.54	725,545.13	1.47	3,315.37	-100.34	
15,704.00	88.87	357.69	11,889.73	3,235.14 N	976.25 W	507,749.54	725,545.05	1.47	3,317.37	-100.34	
15,706.00	88.87	357.66	11,889.77	3,237.14 N	976.33 W	507,751.54	725,544.97	1.47	3,319.36	-100.34	
15,708.00	88.86	357.63	11,889.81	3,239.13 N	976.41 W	507,753.53	725,544.89	1.47	3,321.36	-100.34	
15,710.00	88.86	357.60	11,889.85	3,241.13 N	976.49 W	507,755.53	725,544.81	1.47	3,323.35	-100.34	
15,712.00	88.85	357.57	11,889.89	3,243.13 N	976.58 W	507,757.53	725,544.72	1.47	3,325.35	-100.34	
15,714.00	88.85	357.54	11,889.93	3,245.13 N	976.66 W	507,759.53	725,544.64	1.47	3,327.35	-100.34	
15,716.00	88.84	357.52	11,889.97	3,247.12 N	976.75 W	507,761.52	725,544.55	1.47	3,329.34	-100.34	
15,718.00	88.84	357.49	11,890.01	3,249.12 N	976.83 W	507,763.52	725,544.47	1.47	3,331.34	-100.34	
15,720.00	88.83	357.46	11,890.05	3,251.12 N	976.92 W	507,765.52	725,544.38	1.47	3,333.33	-100.34	
15,722.00	88.83	357.43	11,890.09	3,253.12 N	977.01 W	507,767.52	725,544.29	1.47	3,335.33	-100.34	
15,724.00	88.82	357.40	11,890.13	3,255.11 N	977.10 W	507,769.51	725,544.20	1.47	3,337.33	-100.34	
15,726.00	88.82	357.37	11,890.17	3,257.11 N	977.19 W	507,771.51	725,544.11	1.47	3,339.32	-100.33	
15,728.00	88.81	357.34	11,890.21	3,259.11 N	977.29 W	507,773.51	725,544.01	1.47	3,341.32	-100.33	
15,730.00	88.81	357.31	11,890.25	3,261.11 N	977.38 W	507,775.51	725,543.92	1.47	3,343.32	-100.33	
15,732.00	88.80	357.29	11,890.30	3,263.10 N	977.47 W	507,777.50	725,543.83	1.47	3,345.31	-100.33	
15,734.00	88.80	357.26	11,890.34	3,265.10 N	977.57 W	507,779.50	725,543.73	1.47	3,347.31	-100.33	
15,736.00	88.79	357.23	11,890.38	3,267.10 N	977.66 W	507,781.50	725,543.64	1.47	3,349.31	-100.33	
15,738.00	88.79	357.20	11,890.42	3,269.10 N	977.76 W	507,783.50	725,543.54	1.47	3,351.30	-100.33	
15,740.00	88.78	357.17	11,890.47	3,271.09 N	977.86 W	507,785.49	725,543.44	1.47	3,353.30	-100.33	
15,742.00	88.75	357.12	11,890.51	3,273.09 N	977.96 W	507,787.49	725,543.34	2.91	3,355.30	-119.49	
15,744.00	88.72	357.07	11,890.55	3,275.09 N	978.06 W	507,789.49	725,543.24	2.91	3,357.29	-119.48	
15,746.00	88.69	357.02	11,890.60	3,277.08 N	978.16 W	507,791.48	725,543.14	2.91	3,359.29	-119.48	
15,748.00	88.67	356.97	11,890.64	3,279.08 N	978.27 W	507,793.48	725,543.03	2.91	3,361.29	-119.48	
15,750.00	88.64	356.92	11,890.69	3,281.08 N	978.37 W	507,795.48	725,542.93	2.91	3,363.29	-119.48	
15,752.00	88.61	356.87	11,890.74	3,283.07 N	978.48 W	507,797.47	725,542.82	2.91	3,365.28	-119.48	
15,754.00	88.58	356.82	11,890.79	3,285.07 N	978.59 W	507,799.47	725,542.71	2.91	3,367.28	-119.48	
15,756.00	88.55	356.76	11,890.84	3,287.07 N	978.71 W	507,801.47	725,542.59	2.91	3,369.28	-119.48	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
15,758.00	88.52	356.71	11,890.89	3,289.06 N	978.82 W	507,803.46	725,542.48	2.91	3,371.27	-119.48	
15,760.00	88.49	356.66	11,890.94	3,291.06 N	978.93 W	507,805.46	725,542.37	2.91	3,373.27	-119.48	
15,762.00	88.46	356.61	11,890.99	3,293.05 N	979.05 W	507,807.45	725,542.25	2.91	3,375.27	-119.47	
15,764.00	88.44	356.56	11,891.05	3,295.05 N	979.17 W	507,809.45	725,542.13	2.91	3,377.27	-119.47	
15,766.00	88.41	356.51	11,891.10	3,297.05 N	979.29 W	507,811.45	725,542.01	2.91	3,379.26	-119.47	
15,768.00	88.38	356.46	11,891.16	3,299.04 N	979.41 W	507,813.44	725,541.89	2.91	3,381.26	-119.47	
15,770.00	88.35	356.41	11,891.22	3,301.04 N	979.54 W	507,815.44	725,541.76	2.91	3,383.26	-119.47	
15,772.00	88.32	356.36	11,891.27	3,303.03 N	979.66 W	507,817.43	725,541.64	2.91	3,385.26	-119.47	
15,774.00	88.29	356.31	11,891.33	3,305.03 N	979.79 W	507,819.43	725,541.51	2.91	3,387.26	-119.47	
15,776.00	88.26	356.26	11,891.39	3,307.02 N	979.92 W	507,821.42	725,541.38	2.91	3,389.25	-119.46	
15,778.00	88.24	356.21	11,891.45	3,309.02 N	980.05 W	507,823.42	725,541.25	2.91	3,391.25	-119.46	
15,780.00	88.21	356.16	11,891.52	3,311.01 N	980.19 W	507,825.41	725,541.11	2.91	3,393.25	-119.46	
15,782.00	88.18	356.10	11,891.58	3,313.01 N	980.32 W	507,827.41	725,540.98	2.91	3,395.25	-119.46	
15,784.00	88.15	356.05	11,891.64	3,315.00 N	980.46 W	507,829.40	725,540.84	2.91	3,397.24	-119.46	
15,786.00	88.12	356.00	11,891.71	3,316.99 N	980.60 W	507,831.39	725,540.70	2.91	3,399.24	-119.46	
15,788.00	88.09	355.95	11,891.78	3,318.99 N	980.74 W	507,833.39	725,540.56	2.91	3,401.24	-119.45	
15,790.00	88.06	355.90	11,891.84	3,320.98 N	980.88 W	507,835.38	725,540.42	2.91	3,403.24	-119.45	
15,792.00	88.04	355.85	11,891.91	3,322.98 N	981.02 W	507,837.38	725,540.28	2.91	3,405.24	-119.45	
15,794.00	88.01	355.80	11,891.98	3,324.97 N	981.17 W	507,839.37	725,540.13	2.91	3,407.23	-119.45	
15,796.00	87.98	355.75	11,892.05	3,326.96 N	981.32 W	507,841.36	725,539.98	2.91	3,409.23	-119.45	
15,798.00	87.95	355.70	11,892.12	3,328.96 N	981.46 W	507,843.36	725,539.84	2.91	3,411.23	-119.45	
15,800.00	87.92	355.65	11,892.19	3,330.95 N	981.62 W	507,845.35	725,539.68	2.91	3,413.23	-119.44	
15,802.00	87.89	355.60	11,892.27	3,332.94 N	981.77 W	507,847.34	725,539.53	2.91	3,415.23	-119.44	
15,804.00	87.86	355.55	11,892.34	3,334.93 N	981.92 W	507,849.33	725,539.38	2.91	3,417.22	-119.44	
15,806.00	87.83	355.50	11,892.41	3,336.93 N	982.08 W	507,851.33	725,539.22	2.91	3,419.22	-119.44	
15,808.00	87.81	355.45	11,892.49	3,338.92 N	982.24 W	507,853.32	725,539.06	2.91	3,421.22	-119.44	
15,810.00	87.78	355.39	11,892.57	3,340.91 N	982.40 W	507,855.31	725,538.90	2.91	3,423.22	-119.43	
15,812.00	87.75	355.34	11,892.65	3,342.90 N	982.56 W	507,857.30	725,538.74	2.91	3,425.22	-119.43	
15,814.00	87.72	355.29	11,892.73	3,344.89 N	982.72 W	507,859.29	725,538.58	2.91	3,427.21	-119.43	
15,816.00	87.69	355.24	11,892.81	3,346.89 N	982.88 W	507,861.29	725,538.42	2.91	3,429.21	-119.43	
15,818.00	87.66	355.19	11,892.89	3,348.88 N	983.05 W	507,863.28	725,538.25	2.91	3,431.21	-119.43	
15,820.00	87.63	355.14	11,892.97	3,350.87 N	983.22 W	507,865.27	725,538.08	2.91	3,433.21	-119.42	
15,822.00	87.61	355.09	11,893.05	3,352.86 N	983.39 W	507,867.26	725,537.91	2.91	3,435.21	-119.42	
15,824.00	87.58	355.04	11,893.14	3,354.85 N	983.56 W	507,869.25	725,537.74	2.91	3,437.20	-119.42	
15,826.00	87.55	354.99	11,893.22	3,356.84 N	983.74 W	507,871.24	725,537.56	2.91	3,439.20	-119.42	
15,828.00	87.52	354.94	11,893.31	3,358.83 N	983.91 W	507,873.23	725,537.39	2.91	3,441.20	-119.42	
15,830.00	87.49	354.89	11,893.39	3,360.82 N	984.09 W	507,875.22	725,537.21	2.91	3,443.20	-119.41	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
15,832.00	87.46	354.84	11,893.48	3,362.81 N	984.27 W	507,877.21	725,537.03	2.91	3,445.20	-119.41	
15,834.00	87.43	354.79	11,893.57	3,364.80 N	984.45 W	507,879.20	725,536.85	2.91	3,447.19	-119.41	
15,836.00	87.46	354.80	11,893.66	3,366.79 N	984.63 W	507,881.19	725,536.67	1.59	3,449.19	26.78	
15,838.00	87.55	354.88	11,893.75	3,368.78 N	984.81 W	507,883.18	725,536.49	5.83	3,451.19	42.91	
15,840.00	87.63	354.96	11,893.83	3,370.77 N	984.99 W	507,885.17	725,536.31	5.83	3,453.19	42.91	
15,842.00	87.72	355.04	11,893.91	3,372.76 N	985.16 W	507,887.16	725,536.14	5.83	3,455.19	42.90	
15,844.00	87.80	355.12	11,893.99	3,374.75 N	985.33 W	507,889.15	725,535.97	5.83	3,457.18	42.90	
15,846.00	87.89	355.20	11,894.07	3,376.75 N	985.50 W	507,891.15	725,535.80	5.83	3,459.18	42.90	
15,848.00	87.98	355.28	11,894.14	3,378.74 N	985.67 W	507,893.14	725,535.63	5.83	3,461.18	42.89	
15,850.00	88.06	355.36	11,894.21	3,380.73 N	985.83 W	507,895.13	725,535.47	5.83	3,463.18	42.89	
15,852.00	88.15	355.44	11,894.27	3,382.72 N	985.99 W	507,897.12	725,535.31	5.83	3,465.18	42.89	
15,854.00	88.23	355.51	11,894.34	3,384.71 N	986.15 W	507,899.11	725,535.15	5.83	3,467.18	42.89	
15,856.00	88.32	355.59	11,894.40	3,386.71 N	986.30 W	507,901.11	725,535.00	5.83	3,469.18	42.88	
15,858.00	88.40	355.67	11,894.45	3,388.70 N	986.46 W	507,903.10	725,534.84	5.83	3,471.17	42.88	
15,860.00	88.49	355.75	11,894.51	3,390.69 N	986.60 W	507,905.09	725,534.70	5.83	3,473.17	42.88	
15,862.00	88.57	355.83	11,894.56	3,392.69 N	986.75 W	507,907.09	725,534.55	5.83	3,475.17	42.88	
15,864.00	88.66	355.91	11,894.61	3,394.68 N	986.90 W	507,909.08	725,534.40	5.83	3,477.17	42.87	
15,866.00	88.74	355.99	11,894.65	3,396.68 N	987.04 W	507,911.08	725,534.26	5.83	3,479.17	42.87	
15,868.00	88.83	356.07	11,894.70	3,398.67 N	987.18 W	507,913.07	725,534.12	5.83	3,481.17	42.87	
15,870.00	88.92	356.15	11,894.73	3,400.67 N	987.31 W	507,915.07	725,533.99	5.83	3,483.17	42.87	
15,872.00	89.00	356.23	11,894.77	3,402.66 N	987.44 W	507,917.06	725,533.86	5.83	3,485.16	42.87	
15,874.00	89.09	356.31	11,894.80	3,404.66 N	987.57 W	507,919.06	725,533.73	5.83	3,487.16	42.87	
15,876.00	89.17	356.39	11,894.83	3,406.65 N	987.70 W	507,921.05	725,533.60	5.83	3,489.16	42.86	
15,878.00	89.26	356.47	11,894.86	3,408.65 N	987.83 W	507,923.05	725,533.47	5.83	3,491.16	42.86	
15,880.00	89.34	356.55	11,894.89	3,410.65 N	987.95 W	507,925.05	725,533.35	5.83	3,493.16	42.86	
15,882.00	89.43	356.63	11,894.91	3,412.64 N	988.07 W	507,927.04	725,533.23	5.83	3,495.16	42.86	
15,884.00	89.51	356.71	11,894.93	3,414.64 N	988.18 W	507,929.04	725,533.12	5.83	3,497.15	42.86	
15,886.00	89.60	356.78	11,894.94	3,416.63 N	988.30 W	507,931.03	725,533.00	5.83	3,499.15	42.86	
15,888.00	89.68	356.86	11,894.95	3,418.63 N	988.41 W	507,933.03	725,532.89	5.83	3,501.15	42.86	
15,890.00	89.77	356.94	11,894.96	3,420.63 N	988.52 W	507,935.03	725,532.78	5.83	3,503.15	42.86	
15,892.00	89.86	357.02	11,894.97	3,422.63 N	988.62 W	507,937.03	725,532.68	5.83	3,505.14	42.86	
15,894.00	89.94	357.10	11,894.97	3,424.62 N	988.72 W	507,939.02	725,532.58	5.83	3,507.14	42.86	
15,896.00	90.03	357.18	11,894.97	3,426.62 N	988.82 W	507,941.02	725,532.48	5.83	3,509.14	42.86	
15,898.00	90.11	357.26	11,894.97	3,428.62 N	988.92 W	507,943.02	725,532.38	5.83	3,511.14	42.86	
15,900.00	90.20	357.34	11,894.97	3,430.62 N	989.01 W	507,945.02	725,532.29	5.83	3,513.13	42.86	
15,902.00	90.28	357.42	11,894.96	3,432.61 N	989.11 W	507,947.01	725,532.19	5.83	3,515.13	42.86	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates (usft)		Map Coordinates (usft)		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing	Easting	Northing	Easting				
15,904.00	90.37	357.50	11,894.95	3,434.61 N	989.19 W	507,949.01	725,532.11	5.83	3,517.13	42.86	
15,906.00	90.45	357.58	11,894.93	3,436.61 N	989.28 W	507,951.01	725,532.02	5.83	3,519.12	42.86	
15,908.00	90.54	357.66	11,894.92	3,438.61 N	989.36 W	507,953.01	725,531.94	5.83	3,521.12	42.86	
15,910.00	90.63	357.74	11,894.89	3,440.61 N	989.44 W	507,955.01	725,531.86	5.83	3,523.12	42.86	
15,912.00	90.71	357.82	11,894.87	3,442.61 N	989.52 W	507,957.01	725,531.78	5.83	3,525.11	42.86	
15,914.00	90.80	357.90	11,894.85	3,444.60 N	989.60 W	507,959.00	725,531.70	5.83	3,527.11	42.86	
15,916.00	90.88	357.97	11,894.82	3,446.60 N	989.67 W	507,961.00	725,531.63	5.83	3,529.10	42.86	
15,918.00	90.97	358.05	11,894.78	3,448.60 N	989.74 W	507,963.00	725,531.56	5.83	3,531.10	42.86	
15,920.00	91.05	358.13	11,894.75	3,450.60 N	989.80 W	507,965.00	725,531.50	5.83	3,533.09	42.87	
15,922.00	91.14	358.21	11,894.71	3,452.60 N	989.87 W	507,967.00	725,531.43	5.83	3,535.09	42.87	
15,924.00	91.22	358.29	11,894.67	3,454.60 N	989.93 W	507,969.00	725,531.37	5.83	3,537.08	42.87	
15,926.00	91.31	358.37	11,894.62	3,456.60 N	989.99 W	507,971.00	725,531.31	5.83	3,539.08	42.87	
15,928.00	91.39	358.45	11,894.58	3,458.59 N	990.04 W	507,972.99	725,531.26	5.83	3,541.07	42.87	
15,930.00	91.48	358.53	11,894.53	3,460.59 N	990.10 W	507,974.99	725,531.20	5.83	3,543.06	42.87	
15,932.00	91.50	358.57	11,894.48	3,462.59 N	990.15 W	507,976.99	725,531.15	2.25	3,545.06	68.86	
15,934.00	91.51	358.61	11,894.42	3,464.59 N	990.19 W	507,978.99	725,531.11	2.25	3,547.05	68.87	
15,936.00	91.53	358.66	11,894.37	3,466.59 N	990.24 W	507,980.99	725,531.06	2.25	3,549.05	68.87	
15,938.00	91.54	358.70	11,894.32	3,468.59 N	990.29 W	507,982.99	725,531.01	2.25	3,551.04	68.87	
15,940.00	91.56	358.74	11,894.26	3,470.59 N	990.33 W	507,984.99	725,530.97	2.25	3,553.03	68.87	
15,942.00	91.58	358.78	11,894.21	3,472.58 N	990.38 W	507,986.98	725,530.92	2.25	3,555.02	68.87	
15,944.00	91.59	358.82	11,894.15	3,474.58 N	990.42 W	507,988.98	725,530.88	2.25	3,557.02	68.87	
15,946.00	91.61	358.87	11,894.10	3,476.58 N	990.46 W	507,990.98	725,530.84	2.25	3,559.01	68.87	
15,948.00	91.63	358.91	11,894.04	3,478.58 N	990.50 W	507,992.98	725,530.80	2.25	3,561.00	68.87	
15,950.00	91.64	358.95	11,893.98	3,480.58 N	990.53 W	507,994.98	725,530.77	2.25	3,562.99	68.87	
15,952.00	91.66	358.99	11,893.93	3,482.58 N	990.57 W	507,996.98	725,530.73	2.25	3,564.99	68.88	
15,954.00	91.67	359.03	11,893.87	3,484.58 N	990.61 W	507,998.98	725,530.69	2.25	3,566.98	68.88	
15,956.00	91.69	359.07	11,893.81	3,486.58 N	990.64 W	508,000.98	725,530.66	2.25	3,568.97	68.88	
15,958.00	91.71	359.12	11,893.75	3,488.58 N	990.67 W	508,002.98	725,530.63	2.25	3,570.96	68.88	
15,960.00	91.72	359.16	11,893.69	3,490.57 N	990.70 W	508,004.97	725,530.60	2.25	3,572.95	68.88	
15,962.00	91.74	359.20	11,893.63	3,492.57 N	990.73 W	508,006.97	725,530.57	2.25	3,574.95	68.88	
15,964.00	91.76	359.24	11,893.57	3,494.57 N	990.76 W	508,008.97	725,530.54	2.25	3,576.94	68.88	
15,966.00	91.77	359.28	11,893.51	3,496.57 N	990.78 W	508,010.97	725,530.52	2.25	3,578.93	68.88	
15,968.00	91.79	359.33	11,893.44	3,498.57 N	990.81 W	508,012.97	725,530.49	2.25	3,580.92	68.89	
15,970.00	91.80	359.37	11,893.38	3,500.57 N	990.83 W	508,014.97	725,530.47	2.25	3,582.91	68.89	
15,972.00	91.82	359.41	11,893.32	3,502.57 N	990.85 W	508,016.97	725,530.45	2.25	3,584.90	68.89	
15,974.00	91.84	359.45	11,893.25	3,504.57 N	990.87 W	508,018.97	725,530.43	2.25	3,586.89	68.89	
15,976.00	91.85	359.49	11,893.19	3,506.57 N	990.89 W	508,020.97	725,530.41	2.25	3,588.88	68.89	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates (usft)		Map Coordinates (usft)		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing	Easting	Northing	Easting				
15,978.00	91.87	359.54	11,893.13	3,508.56 N	990.90 W	508,022.96	725,530.40	2.25	3,590.87	68.89	
15,980.00	91.88	359.58	11,893.06	3,510.56 N	990.92 W	508,024.96	725,530.38	2.25	3,592.86	68.89	
15,982.00	91.90	359.62	11,892.99	3,512.56 N	990.93 W	508,026.96	725,530.37	2.25	3,594.85	68.89	
15,984.00	91.92	359.66	11,892.93	3,514.56 N	990.95 W	508,028.96	725,530.35	2.25	3,596.84	68.90	
15,986.00	91.93	359.70	11,892.86	3,516.56 N	990.96 W	508,030.96	725,530.34	2.25	3,598.83	68.90	
15,988.00	91.95	359.75	11,892.79	3,518.56 N	990.97 W	508,032.96	725,530.33	2.25	3,600.82	68.90	
15,990.00	91.97	359.79	11,892.72	3,520.56 N	990.98 W	508,034.96	725,530.32	2.25	3,602.81	68.90	
15,992.00	91.98	359.83	11,892.65	3,522.56 N	990.98 W	508,036.96	725,530.32	2.25	3,604.80	68.90	
15,994.00	92.00	359.87	11,892.59	3,524.56 N	990.99 W	508,038.96	725,530.31	2.25	3,606.79	68.90	
15,996.00	92.01	359.91	11,892.52	3,526.55 N	990.99 W	508,040.95	725,530.31	2.25	3,608.78	68.90	
15,998.00	92.03	359.95	11,892.44	3,528.55 N	990.99 W	508,042.95	725,530.31	2.25	3,610.77	68.91	
16,000.00	92.05	360.00	11,892.37	3,530.55 N	990.99 W	508,044.95	725,530.31	2.25	3,612.76	68.91	
16,002.00	92.06	0.04	11,892.30	3,532.55 N	990.99 W	508,046.95	725,530.31	2.25	3,614.74	68.91	
16,004.00	92.08	0.08	11,892.23	3,534.55 N	990.99 W	508,048.95	725,530.31	2.25	3,616.73	68.91	
16,006.00	92.09	0.12	11,892.16	3,536.55 N	990.99 W	508,050.95	725,530.31	2.25	3,618.72	68.91	
16,008.00	92.11	0.16	11,892.08	3,538.55 N	990.98 W	508,052.95	725,530.32	2.25	3,620.71	68.91	
16,010.00	92.13	0.21	11,892.01	3,540.54 N	990.98 W	508,054.94	725,530.32	2.25	3,622.70	68.92	
16,012.00	92.14	0.25	11,891.94	3,542.54 N	990.97 W	508,056.94	725,530.33	2.25	3,624.68	68.92	
16,014.00	92.16	0.29	11,891.86	3,544.54 N	990.96 W	508,058.94	725,530.34	2.25	3,626.67	68.92	
16,016.00	92.18	0.33	11,891.78	3,546.54 N	990.95 W	508,060.94	725,530.35	2.25	3,628.66	68.92	
16,018.00	92.19	0.37	11,891.71	3,548.54 N	990.94 W	508,062.94	725,530.36	2.25	3,630.64	68.92	
16,020.00	92.21	0.42	11,891.63	3,550.54 N	990.92 W	508,064.94	725,530.38	2.25	3,632.63	68.92	
16,022.00	92.22	0.46	11,891.55	3,552.54 N	990.91 W	508,066.94	725,530.39	2.25	3,634.62	68.92	
16,024.00	92.24	0.50	11,891.48	3,554.53 N	990.89 W	508,068.93	725,530.41	2.25	3,636.60	68.93	
16,026.00	92.17	0.47	11,891.40	3,556.53 N	990.87 W	508,070.93	725,530.43	3.95	3,638.59	-158.08	
16,028.00	92.09	0.44	11,891.32	3,558.53 N	990.86 W	508,072.93	725,530.44	3.95	3,640.58	-158.08	
16,030.00	92.02	0.41	11,891.25	3,560.53 N	990.84 W	508,074.93	725,530.46	3.95	3,642.56	-158.08	
16,032.00	91.95	0.38	11,891.18	3,562.53 N	990.83 W	508,076.93	725,530.47	3.95	3,644.55	-158.08	
16,034.00	91.87	0.35	11,891.12	3,564.53 N	990.82 W	508,078.93	725,530.48	3.95	3,646.54	-158.08	
16,036.00	91.80	0.32	11,891.05	3,566.53 N	990.80 W	508,080.93	725,530.50	3.95	3,648.53	-158.08	
16,038.00	91.73	0.29	11,890.99	3,568.53 N	990.79 W	508,082.93	725,530.51	3.95	3,650.51	-158.08	
16,040.00	91.65	0.26	11,890.93	3,570.52 N	990.78 W	508,084.92	725,530.52	3.95	3,652.50	-158.08	
16,042.00	91.58	0.23	11,890.88	3,572.52 N	990.78 W	508,086.92	725,530.52	3.95	3,654.49	-158.08	
16,044.00	91.51	0.21	11,890.82	3,574.52 N	990.77 W	508,088.92	725,530.53	3.95	3,656.48	-158.08	
16,046.00	91.43	0.18	11,890.77	3,576.52 N	990.76 W	508,090.92	725,530.54	3.95	3,658.47	-158.09	
16,048.00	91.36	0.15	11,890.72	3,578.52 N	990.76 W	508,092.92	725,530.54	3.95	3,660.45	-158.09	
16,050.00	91.29	0.12	11,890.68	3,580.52 N	990.75 W	508,094.92	725,530.55	3.95	3,662.44	-158.09	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
16,052.00	91.21	0.09	11,890.63	3,582.52 N	990.75 W	508,096.92	725,530.55	3.95	3,664.43	-158.09	
16,054.00	91.14	0.06	11,890.59	3,584.52 N	990.74 W	508,098.92	725,530.56	3.95	3,666.42	-158.09	
16,056.00	91.07	0.03	11,890.55	3,586.52 N	990.74 W	508,100.92	725,530.56	3.95	3,668.41	-158.09	
16,058.00	90.99	360.00	11,890.52	3,588.52 N	990.74 W	508,102.92	725,530.56	3.95	3,670.40	-158.09	
16,060.00	90.92	359.97	11,890.48	3,590.52 N	990.74 W	508,104.92	725,530.56	3.95	3,672.39	-158.09	
16,062.00	90.85	359.94	11,890.45	3,592.52 N	990.74 W	508,106.92	725,530.56	3.95	3,674.38	-158.09	
16,064.00	90.77	359.91	11,890.42	3,594.52 N	990.75 W	508,108.92	725,530.55	3.95	3,676.37	-158.09	
16,066.00	90.70	359.88	11,890.40	3,596.52 N	990.75 W	508,110.92	725,530.55	3.95	3,678.36	-158.09	
16,068.00	90.63	359.85	11,890.38	3,598.52 N	990.76 W	508,112.92	725,530.54	3.95	3,680.35	-158.09	
16,070.00	90.55	359.82	11,890.35	3,600.52 N	990.76 W	508,114.92	725,530.54	3.95	3,682.34	-158.09	
16,072.00	90.48	359.79	11,890.34	3,602.52 N	990.77 W	508,116.92	725,530.53	3.95	3,684.33	-158.09	
16,074.00	90.41	359.76	11,890.32	3,604.52 N	990.78 W	508,118.92	725,530.52	3.95	3,686.32	-158.09	
16,076.00	90.34	359.73	11,890.31	3,606.52 N	990.78 W	508,120.92	725,530.52	3.95	3,688.31	-158.09	
16,078.00	90.26	359.70	11,890.30	3,608.52 N	990.79 W	508,122.92	725,530.51	3.95	3,690.30	-158.09	
16,080.00	90.19	359.67	11,890.29	3,610.52 N	990.81 W	508,124.92	725,530.49	3.95	3,692.29	-158.09	
16,082.00	90.12	359.65	11,890.28	3,612.52 N	990.82 W	508,126.92	725,530.48	3.95	3,694.28	-158.09	
16,084.00	90.04	359.62	11,890.28	3,614.52 N	990.83 W	508,128.92	725,530.47	3.95	3,696.27	-158.09	
16,086.00	89.97	359.59	11,890.28	3,616.52 N	990.84 W	508,130.92	725,530.46	3.95	3,698.26	-158.09	
16,088.00	89.90	359.56	11,890.28	3,618.52 N	990.86 W	508,132.92	725,530.44	3.95	3,700.26	-158.09	
16,090.00	89.82	359.53	11,890.29	3,620.52 N	990.88 W	508,134.92	725,530.42	3.95	3,702.25	-158.09	
16,092.00	89.75	359.50	11,890.30	3,622.52 N	990.89 W	508,136.92	725,530.41	3.95	3,704.24	-158.09	
16,094.00	89.68	359.47	11,890.31	3,624.52 N	990.91 W	508,138.92	725,530.39	3.95	3,706.23	-158.09	
16,096.00	89.60	359.44	11,890.32	3,626.52 N	990.93 W	508,140.92	725,530.37	3.95	3,708.22	-158.09	
16,098.00	89.53	359.41	11,890.33	3,628.52 N	990.95 W	508,142.92	725,530.35	3.95	3,710.21	-158.09	
16,100.00	89.46	359.38	11,890.35	3,630.52 N	990.97 W	508,144.92	725,530.33	3.95	3,712.20	-158.09	
16,102.00	89.38	359.35	11,890.37	3,632.52 N	990.99 W	508,146.92	725,530.31	3.95	3,714.20	-158.09	
16,104.00	89.31	359.32	11,890.39	3,634.52 N	991.02 W	508,148.92	725,530.28	3.95	3,716.19	-158.09	
16,106.00	89.24	359.29	11,890.42	3,636.52 N	991.04 W	508,150.92	725,530.26	3.95	3,718.18	-158.09	
16,108.00	89.16	359.26	11,890.45	3,638.52 N	991.07 W	508,152.92	725,530.23	3.95	3,720.17	-158.09	
16,110.00	89.09	359.23	11,890.48	3,640.52 N	991.09 W	508,154.92	725,530.21	3.95	3,722.16	-158.09	
16,112.00	89.02	359.20	11,890.51	3,642.52 N	991.12 W	508,156.92	725,530.18	3.95	3,724.16	-158.09	
16,114.00	88.94	359.17	11,890.55	3,644.51 N	991.15 W	508,158.91	725,530.15	3.95	3,726.15	-158.09	
16,116.00	88.87	359.14	11,890.59	3,646.51 N	991.18 W	508,160.91	725,530.12	3.95	3,728.14	-158.09	
16,118.00	88.80	359.11	11,890.63	3,648.51 N	991.21 W	508,162.91	725,530.09	3.95	3,730.13	-158.09	
16,120.00	88.76	359.11	11,890.67	3,650.51 N	991.24 W	508,164.91	725,530.06	1.70	3,732.12	-178.83	
16,122.00	88.77	359.14	11,890.71	3,652.51 N	991.27 W	508,166.91	725,530.03	1.43	3,734.12	79.29	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
16,124.00	88.77	359.17	11,890.75	3,654.51 N	991.30 W	508,168.91	725,530.00	1.43	3,736.11	79.29	
16,126.00	88.78	359.20	11,890.80	3,656.51 N	991.33 W	508,170.91	725,529.97	1.43	3,738.10	79.29	
16,128.00	88.78	359.23	11,890.84	3,658.51 N	991.35 W	508,172.91	725,529.95	1.43	3,740.09	79.28	
16,130.00	88.79	359.25	11,890.88	3,660.51 N	991.38 W	508,174.91	725,529.92	1.43	3,742.08	79.28	
16,132.00	88.79	359.28	11,890.92	3,662.51 N	991.41 W	508,176.91	725,529.89	1.43	3,744.08	79.28	
16,134.00	88.80	359.31	11,890.97	3,664.51 N	991.43 W	508,178.91	725,529.87	1.43	3,746.07	79.28	
16,136.00	88.81	359.34	11,891.01	3,666.51 N	991.45 W	508,180.91	725,529.85	1.43	3,748.06	79.28	
16,138.00	88.81	359.37	11,891.05	3,668.51 N	991.48 W	508,182.91	725,529.82	1.43	3,750.05	79.28	
16,140.00	88.82	359.39	11,891.09	3,670.51 N	991.50 W	508,184.91	725,529.80	1.43	3,752.04	79.28	
16,142.00	88.82	359.42	11,891.13	3,672.51 N	991.52 W	508,186.91	725,529.78	1.43	3,754.03	79.28	
16,144.00	88.83	359.45	11,891.17	3,674.51 N	991.54 W	508,188.91	725,529.76	1.43	3,756.02	79.28	
16,146.00	88.83	359.48	11,891.21	3,676.51 N	991.56 W	508,190.91	725,529.74	1.43	3,758.02	79.28	
16,148.00	88.84	359.51	11,891.26	3,678.50 N	991.57 W	508,192.90	725,529.73	1.43	3,760.01	79.28	
16,150.00	88.84	359.54	11,891.30	3,680.50 N	991.59 W	508,194.90	725,529.71	1.43	3,762.00	79.28	
16,152.00	88.85	359.56	11,891.34	3,682.50 N	991.61 W	508,196.90	725,529.69	1.43	3,763.99	79.28	
16,154.00	88.85	359.59	11,891.38	3,684.50 N	991.62 W	508,198.90	725,529.68	1.43	3,765.98	79.28	
16,156.00	88.86	359.62	11,891.42	3,686.50 N	991.64 W	508,200.90	725,529.66	1.43	3,767.97	79.28	
16,158.00	88.86	359.65	11,891.46	3,688.50 N	991.65 W	508,202.90	725,529.65	1.43	3,769.96	79.28	
16,160.00	88.87	359.68	11,891.50	3,690.50 N	991.66 W	508,204.90	725,529.64	1.43	3,771.95	79.28	
16,162.00	88.87	359.70	11,891.53	3,692.50 N	991.67 W	508,206.90	725,529.63	1.43	3,773.94	79.27	
16,164.00	88.88	359.73	11,891.57	3,694.50 N	991.68 W	508,208.90	725,529.62	1.43	3,775.93	79.27	
16,166.00	88.88	359.76	11,891.61	3,696.50 N	991.69 W	508,210.90	725,529.61	1.43	3,777.92	79.27	
16,168.00	88.89	359.79	11,891.65	3,698.50 N	991.70 W	508,212.90	725,529.60	1.43	3,779.91	79.27	
16,170.00	88.90	359.82	11,891.69	3,700.50 N	991.70 W	508,214.90	725,529.60	1.43	3,781.90	79.27	
16,172.00	88.90	359.84	11,891.73	3,702.50 N	991.71 W	508,216.90	725,529.59	1.43	3,783.89	79.27	
16,174.00	88.91	359.87	11,891.77	3,704.50 N	991.72 W	508,218.90	725,529.58	1.43	3,785.88	79.27	
16,176.00	88.91	359.90	11,891.81	3,706.50 N	991.72 W	508,220.90	725,529.58	1.43	3,787.87	79.27	
16,178.00	88.92	359.93	11,891.84	3,708.50 N	991.72 W	508,222.90	725,529.58	1.43	3,789.86	79.27	
16,180.00	88.92	359.96	11,891.88	3,710.50 N	991.72 W	508,224.90	725,529.58	1.43	3,791.85	79.27	
16,182.00	88.93	359.98	11,891.92	3,712.50 N	991.73 W	508,226.90	725,529.57	1.43	3,793.84	79.27	
16,184.00	88.93	0.01	11,891.96	3,714.50 N	991.73 W	508,228.90	725,529.57	1.43	3,795.83	79.27	
16,186.00	88.94	0.04	11,891.99	3,716.50 N	991.72 W	508,230.90	725,529.58	1.43	3,797.82	79.27	
16,188.00	88.94	0.07	11,892.03	3,718.50 N	991.72 W	508,232.90	725,529.58	1.43	3,799.81	79.27	
16,190.00	88.95	0.10	11,892.07	3,720.50 N	991.72 W	508,234.90	725,529.58	1.43	3,801.80	79.27	
16,192.00	88.95	0.13	11,892.10	3,722.50 N	991.72 W	508,236.90	725,529.58	1.43	3,803.79	79.27	
16,194.00	88.96	0.15	11,892.14	3,724.50 N	991.71 W	508,238.90	725,529.59	1.43	3,805.77	79.27	
16,196.00	88.96	0.18	11,892.18	3,726.50 N	991.71 W	508,240.90	725,529.59	1.43	3,807.76	79.27	



Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
16,198.00	88.97	0.21	11,892.21	3,728.49 N	991.70 W	508,242.89	725,529.60	1.43	3,809.75	79.27	
16,200.00	88.98	0.24	11,892.25	3,730.49 N	991.69 W	508,244.89	725,529.61	1.43	3,811.74	79.26	
16,202.00	88.98	0.27	11,892.28	3,732.49 N	991.68 W	508,246.89	725,529.62	1.43	3,813.73	79.26	
16,204.00	88.99	0.29	11,892.32	3,734.49 N	991.67 W	508,248.89	725,529.63	1.43	3,815.72	79.26	
16,206.00	88.99	0.32	11,892.35	3,736.49 N	991.66 W	508,250.89	725,529.64	1.43	3,817.71	79.26	
16,208.00	89.00	0.35	11,892.39	3,738.49 N	991.65 W	508,252.89	725,529.65	1.43	3,819.69	79.26	
16,210.00	89.00	0.38	11,892.42	3,740.49 N	991.64 W	508,254.89	725,529.66	1.43	3,821.68	79.26	
16,212.00	89.01	0.41	11,892.46	3,742.49 N	991.62 W	508,256.89	725,529.68	1.43	3,823.67	79.26	
16,214.00	89.02	0.41	11,892.49	3,744.49 N	991.61 W	508,258.89	725,529.69	0.87	3,825.66	13.04	
16,216.00	89.05	0.39	11,892.53	3,746.49 N	991.59 W	508,260.89	725,529.71	1.75	3,827.65	-35.22	
16,218.00	89.08	0.37	11,892.56	3,748.49 N	991.58 W	508,262.89	725,529.72	1.75	3,829.63	-35.22	
16,220.00	89.11	0.35	11,892.59	3,750.49 N	991.57 W	508,264.89	725,529.73	1.75	3,831.62	-35.22	
16,222.00	89.14	0.33	11,892.62	3,752.49 N	991.56 W	508,266.89	725,529.74	1.75	3,833.61	-35.22	
16,224.00	89.17	0.31	11,892.65	3,754.49 N	991.55 W	508,268.89	725,529.75	1.75	3,835.60	-35.22	
16,226.00	89.20	0.29	11,892.68	3,756.49 N	991.54 W	508,270.89	725,529.76	1.75	3,837.59	-35.22	
16,228.00	89.22	0.27	11,892.71	3,758.49 N	991.53 W	508,272.89	725,529.77	1.75	3,839.58	-35.22	
16,230.00	89.25	0.25	11,892.73	3,760.49 N	991.52 W	508,274.89	725,529.78	1.75	3,841.56	-35.22	
16,232.00	89.28	0.23	11,892.76	3,762.49 N	991.51 W	508,276.89	725,529.79	1.75	3,843.55	-35.22	
16,234.00	89.31	0.21	11,892.78	3,764.49 N	991.50 W	508,278.89	725,529.80	1.75	3,845.54	-35.22	
16,236.00	89.34	0.19	11,892.81	3,766.49 N	991.49 W	508,280.89	725,529.81	1.75	3,847.53	-35.22	
16,238.00	89.37	0.17	11,892.83	3,768.49 N	991.49 W	508,282.89	725,529.81	1.75	3,849.52	-35.22	
16,240.00	89.40	0.15	11,892.85	3,770.49 N	991.48 W	508,284.89	725,529.82	1.75	3,851.51	-35.22	
16,242.00	89.43	0.13	11,892.87	3,772.49 N	991.48 W	508,286.89	725,529.82	1.75	3,853.50	-35.22	
16,244.00	89.45	0.11	11,892.89	3,774.49 N	991.47 W	508,288.89	725,529.83	1.75	3,855.49	-35.22	
16,246.00	89.48	0.09	11,892.91	3,776.49 N	991.47 W	508,290.89	725,529.83	1.75	3,857.48	-35.22	
16,248.00	89.51	0.07	11,892.93	3,778.49 N	991.47 W	508,292.89	725,529.83	1.75	3,859.47	-35.22	
16,250.00	89.54	0.05	11,892.94	3,780.49 N	991.47 W	508,294.89	725,529.83	1.75	3,861.46	-35.22	
16,252.00	89.57	0.03	11,892.96	3,782.49 N	991.46 W	508,296.89	725,529.84	1.75	3,863.45	-35.22	
16,254.00	89.60	0.01	11,892.97	3,784.49 N	991.46 W	508,298.89	725,529.84	1.75	3,865.43	-35.22	
16,256.00	89.63	359.99	11,892.99	3,786.49 N	991.46 W	508,300.89	725,529.84	1.75	3,867.42	-35.22	
16,258.00	89.65	359.97	11,893.00	3,788.49 N	991.46 W	508,302.89	725,529.84	1.75	3,869.41	-35.22	
16,260.00	89.68	359.95	11,893.01	3,790.49 N	991.47 W	508,304.89	725,529.83	1.75	3,871.40	-35.22	
16,262.00	89.71	359.92	11,893.02	3,792.49 N	991.47 W	508,306.89	725,529.83	1.75	3,873.39	-35.22	
16,264.00	89.74	359.90	11,893.03	3,794.49 N	991.47 W	508,308.89	725,529.83	1.75	3,875.38	-35.22	
16,266.00	89.77	359.88	11,893.04	3,796.49 N	991.48 W	508,310.89	725,529.82	1.75	3,877.37	-35.22	
16,268.00	89.80	359.86	11,893.05	3,798.49 N	991.48 W	508,312.89	725,529.82	1.75	3,879.36	-35.22	
16,270.00	89.83	359.84	11,893.06	3,800.49 N	991.48 W	508,314.89	725,529.82	1.75	3,881.35	-35.22	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
16,272.00	89.85	359.82	11,893.06	3,802.49 N	991.49 W	508,316.89	725,529.81	1.75	3,883.34	-35.22	
16,274.00	89.88	359.80	11,893.07	3,804.49 N	991.50 W	508,318.89	725,529.80	1.75	3,885.33	-35.22	
16,276.00	89.91	359.78	11,893.07	3,806.49 N	991.50 W	508,320.89	725,529.80	1.75	3,887.33	-35.22	
16,278.00	89.94	359.76	11,893.07	3,808.49 N	991.51 W	508,322.89	725,529.79	1.75	3,889.32	-35.22	
16,280.00	89.97	359.74	11,893.07	3,810.49 N	991.52 W	508,324.89	725,529.78	1.75	3,891.31	-35.22	
16,282.00	90.00	359.72	11,893.07	3,812.49 N	991.53 W	508,326.89	725,529.77	1.75	3,893.30	-35.22	
16,284.00	90.03	359.70	11,893.07	3,814.49 N	991.54 W	508,328.89	725,529.76	1.75	3,895.29	-35.22	
16,286.00	90.06	359.68	11,893.07	3,816.49 N	991.55 W	508,330.89	725,529.75	1.75	3,897.28	-35.22	
16,288.00	90.08	359.66	11,893.07	3,818.49 N	991.56 W	508,332.89	725,529.74	1.75	3,899.27	-35.22	
16,290.00	90.11	359.64	11,893.07	3,820.49 N	991.57 W	508,334.89	725,529.73	1.75	3,901.26	-35.22	
16,292.00	90.14	359.62	11,893.06	3,822.49 N	991.59 W	508,336.89	725,529.71	1.75	3,903.25	-35.22	
16,294.00	90.17	359.60	11,893.06	3,824.49 N	991.60 W	508,338.89	725,529.70	1.75	3,905.24	-35.22	
16,296.00	90.20	359.58	11,893.05	3,826.49 N	991.62 W	508,340.89	725,529.68	1.75	3,907.23	-35.22	
16,298.00	90.23	359.56	11,893.04	3,828.49 N	991.63 W	508,342.89	725,529.67	1.75	3,909.22	-35.22	
16,300.00	90.26	359.54	11,893.03	3,830.49 N	991.65 W	508,344.89	725,529.65	1.75	3,911.22	-35.22	
16,302.00	90.28	359.52	11,893.02	3,832.49 N	991.66 W	508,346.89	725,529.64	1.75	3,913.21	-35.22	
16,304.00	90.31	359.50	11,893.01	3,834.49 N	991.68 W	508,348.89	725,529.62	1.75	3,915.20	-35.22	
16,306.00	90.34	359.48	11,893.00	3,836.49 N	991.70 W	508,350.89	725,529.60	1.75	3,917.19	-35.22	
16,308.00	90.37	359.46	11,892.99	3,838.49 N	991.72 W	508,352.89	725,529.58	1.75	3,919.18	-35.22	
16,310.00	90.39	359.51	11,892.98	3,840.49 N	991.73 W	508,354.89	725,529.57	2.63	3,921.17	71.77	
16,312.00	90.40	359.56	11,892.96	3,842.49 N	991.75 W	508,356.89	725,529.55	2.63	3,923.16	71.77	
16,314.00	90.42	359.61	11,892.95	3,844.49 N	991.76 W	508,358.89	725,529.54	2.63	3,925.16	71.77	
16,316.00	90.44	359.66	11,892.93	3,846.49 N	991.78 W	508,360.89	725,529.52	2.63	3,927.15	71.77	
16,318.00	90.45	359.71	11,892.92	3,848.49 N	991.79 W	508,362.89	725,529.51	2.63	3,929.14	71.77	
16,320.00	90.47	359.76	11,892.90	3,850.49 N	991.80 W	508,364.89	725,529.50	2.63	3,931.13	71.77	
16,322.00	90.49	359.81	11,892.89	3,852.49 N	991.80 W	508,366.89	725,529.50	2.63	3,933.12	71.77	
16,324.00	90.50	359.86	11,892.87	3,854.49 N	991.81 W	508,368.89	725,529.49	2.63	3,935.11	71.77	
16,326.00	90.52	359.91	11,892.85	3,856.49 N	991.81 W	508,370.89	725,529.49	2.63	3,937.10	71.77	
16,328.00	90.53	359.96	11,892.83	3,858.49 N	991.82 W	508,372.89	725,529.48	2.63	3,939.09	71.77	
16,330.00	90.55	0.01	11,892.81	3,860.49 N	991.82 W	508,374.89	725,529.48	2.63	3,941.08	71.77	
16,332.00	90.57	0.06	11,892.79	3,862.49 N	991.82 W	508,376.89	725,529.48	2.63	3,943.07	71.77	
16,334.00	90.58	0.11	11,892.77	3,864.49 N	991.81 W	508,378.89	725,529.49	2.63	3,945.06	71.77	
16,336.00	90.60	0.16	11,892.75	3,866.49 N	991.81 W	508,380.89	725,529.49	2.63	3,947.05	71.77	
16,338.00	90.62	0.21	11,892.73	3,868.49 N	991.80 W	508,382.89	725,529.50	2.63	3,949.03	71.77	
16,340.00	90.63	0.26	11,892.71	3,870.49 N	991.79 W	508,384.89	725,529.51	2.63	3,951.02	71.77	
16,342.00	90.65	0.31	11,892.69	3,872.49 N	991.78 W	508,386.89	725,529.52	2.63	3,953.01	71.78	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
16,344.00	90.67	0.36	11,892.67	3,874.49 N	991.77 W	508,388.89	725,529.53	2.63	3,955.00	71.78	
16,346.00	90.68	0.41	11,892.64	3,876.49 N	991.76 W	508,390.89	725,529.54	2.63	3,956.99	71.78	
16,348.00	90.70	0.46	11,892.62	3,878.49 N	991.74 W	508,392.89	725,529.56	2.63	3,958.98	71.78	
16,350.00	90.71	0.51	11,892.59	3,880.49 N	991.73 W	508,394.89	725,529.57	2.63	3,960.96	71.78	
16,352.00	90.73	0.56	11,892.57	3,882.48 N	991.71 W	508,396.88	725,529.59	2.63	3,962.95	71.78	
16,354.00	90.75	0.61	11,892.54	3,884.48 N	991.69 W	508,398.88	725,529.61	2.63	3,964.94	71.78	
16,356.00	90.76	0.66	11,892.52	3,886.48 N	991.67 W	508,400.88	725,529.63	2.63	3,966.93	71.78	
16,358.00	90.78	0.71	11,892.49	3,888.48 N	991.64 W	508,402.88	725,529.66	2.63	3,968.91	71.78	
16,360.00	90.80	0.76	11,892.46	3,890.48 N	991.62 W	508,404.88	725,529.68	2.63	3,970.90	71.78	
16,362.00	90.81	0.81	11,892.43	3,892.48 N	991.59 W	508,406.88	725,529.71	2.63	3,972.89	71.78	
16,364.00	90.83	0.86	11,892.40	3,894.48 N	991.56 W	508,408.88	725,529.74	2.63	3,974.87	71.78	
16,366.00	90.85	0.91	11,892.37	3,896.48 N	991.53 W	508,410.88	725,529.77	2.63	3,976.86	71.78	
16,368.00	90.86	0.96	11,892.35	3,898.48 N	991.50 W	508,412.88	725,529.80	2.63	3,978.85	71.78	
16,370.00	90.88	1.01	11,892.31	3,900.48 N	991.46 W	508,414.88	725,529.84	2.63	3,980.83	71.78	
16,372.00	90.90	1.06	11,892.28	3,902.48 N	991.43 W	508,416.88	725,529.87	2.63	3,982.82	71.79	
16,374.00	90.91	1.11	11,892.25	3,904.48 N	991.39 W	508,418.88	725,529.91	2.63	3,984.80	71.79	
16,376.00	90.93	1.16	11,892.22	3,906.48 N	991.35 W	508,420.88	725,529.95	2.63	3,986.79	71.79	
16,378.00	90.94	1.21	11,892.19	3,908.48 N	991.31 W	508,422.88	725,529.99	2.63	3,988.77	71.79	
16,380.00	90.96	1.26	11,892.15	3,910.48 N	991.27 W	508,424.88	725,530.03	2.63	3,990.76	71.79	
16,382.00	90.98	1.31	11,892.12	3,912.48 N	991.22 W	508,426.88	725,530.08	2.63	3,992.74	71.79	
16,384.00	90.99	1.36	11,892.09	3,914.48 N	991.17 W	508,428.88	725,530.13	2.63	3,994.72	71.79	
16,386.00	91.01	1.41	11,892.05	3,916.48 N	991.13 W	508,430.88	725,530.17	2.63	3,996.71	71.79	
16,388.00	91.03	1.46	11,892.02	3,918.47 N	991.08 W	508,432.87	725,530.22	2.63	3,998.69	71.79	
16,390.00	91.04	1.51	11,891.98	3,920.47 N	991.02 W	508,434.87	725,530.28	2.63	4,000.68	71.79	
16,392.00	91.06	1.56	11,891.94	3,922.47 N	990.97 W	508,436.87	725,530.33	2.63	4,002.66	71.79	
16,394.00	91.08	1.61	11,891.91	3,924.47 N	990.92 W	508,438.87	725,530.38	2.63	4,004.64	71.79	
16,396.00	91.09	1.66	11,891.87	3,926.47 N	990.86 W	508,440.87	725,530.44	2.63	4,006.63	71.80	
16,398.00	91.11	1.71	11,891.83	3,928.47 N	990.80 W	508,442.87	725,530.50	2.63	4,008.61	71.80	
16,400.00	91.13	1.76	11,891.79	3,930.47 N	990.74 W	508,444.87	725,530.56	2.63	4,010.59	71.80	
16,402.00	91.14	1.81	11,891.75	3,932.47 N	990.68 W	508,446.87	725,530.62	2.63	4,012.57	71.80	
16,404.00	91.13	1.80	11,891.71	3,934.46 N	990.61 W	508,448.86	725,530.69	0.66	4,014.55	-152.77	
16,406.00	91.09	1.74	11,891.67	3,936.46 N	990.55 W	508,450.86	725,530.75	3.68	4,016.54	-122.71	
16,408.00	91.05	1.68	11,891.63	3,938.46 N	990.49 W	508,452.86	725,530.81	3.68	4,018.52	-122.72	
16,410.00	91.01	1.61	11,891.60	3,940.46 N	990.44 W	508,454.86	725,530.86	3.68	4,020.50	-122.72	
16,412.00	90.97	1.55	11,891.56	3,942.46 N	990.38 W	508,456.86	725,530.92	3.68	4,022.48	-122.72	
16,414.00	90.93	1.49	11,891.53	3,944.46 N	990.33 W	508,458.86	725,530.97	3.68	4,024.47	-122.72	
16,416.00	90.89	1.43	11,891.50	3,946.46 N	990.28 W	508,460.86	725,531.02	3.68	4,026.45	-122.72	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
16,418.00	90.85	1.37	11,891.47	3,948.46 N	990.23 W	508,462.86	725,531.07	3.68	4,028.44	-122.72	
16,420.00	90.81	1.30	11,891.44	3,950.46 N	990.18 W	508,464.86	725,531.12	3.68	4,030.42	-122.72	
16,422.00	90.77	1.24	11,891.41	3,952.46 N	990.14 W	508,466.86	725,531.16	3.68	4,032.40	-122.72	
16,424.00	90.73	1.18	11,891.39	3,954.46 N	990.10 W	508,468.86	725,531.20	3.68	4,034.39	-122.72	
16,426.00	90.69	1.12	11,891.36	3,956.45 N	990.06 W	508,470.85	725,531.24	3.68	4,036.37	-122.72	
16,428.00	90.65	1.06	11,891.34	3,958.45 N	990.02 W	508,472.85	725,531.28	3.68	4,038.36	-122.72	
16,430.00	90.61	0.99	11,891.31	3,960.45 N	989.98 W	508,474.85	725,531.32	3.68	4,040.35	-122.73	
16,432.00	90.57	0.93	11,891.29	3,962.45 N	989.95 W	508,476.85	725,531.35	3.68	4,042.33	-122.73	
16,434.00	90.53	0.87	11,891.27	3,964.45 N	989.92 W	508,478.85	725,531.38	3.68	4,044.32	-122.73	
16,436.00	90.49	0.81	11,891.26	3,966.45 N	989.89 W	508,480.85	725,531.41	3.68	4,046.30	-122.73	
16,438.00	90.45	0.75	11,891.24	3,968.45 N	989.86 W	508,482.85	725,531.44	3.68	4,048.29	-122.73	
16,440.00	90.41	0.68	11,891.23	3,970.45 N	989.83 W	508,484.85	725,531.47	3.68	4,050.28	-122.73	
16,442.00	90.37	0.62	11,891.21	3,972.45 N	989.81 W	508,486.85	725,531.49	3.68	4,052.26	-122.73	
16,444.00	90.33	0.56	11,891.20	3,974.45 N	989.79 W	508,488.85	725,531.51	3.68	4,054.25	-122.73	
16,446.00	90.29	0.50	11,891.19	3,976.45 N	989.77 W	508,490.85	725,531.53	3.68	4,056.24	-122.73	
16,448.00	90.25	0.44	11,891.18	3,978.45 N	989.76 W	508,492.85	725,531.54	3.68	4,058.23	-122.73	
16,450.00	90.22	0.37	11,891.17	3,980.45 N	989.74 W	508,494.85	725,531.56	3.68	4,060.22	-122.73	
16,452.00	90.18	0.31	11,891.16	3,982.45 N	989.73 W	508,496.85	725,531.57	3.68	4,062.20	-122.73	
16,454.00	90.14	0.25	11,891.16	3,984.45 N	989.72 W	508,498.85	725,531.58	3.68	4,064.19	-122.73	
16,456.00	90.10	0.19	11,891.15	3,986.45 N	989.71 W	508,500.85	725,531.59	3.68	4,066.18	-122.73	
16,458.00	90.06	0.13	11,891.15	3,988.45 N	989.71 W	508,502.85	725,531.59	3.68	4,068.17	-122.73	
16,460.00	90.02	0.07	11,891.15	3,990.45 N	989.70 W	508,504.85	725,531.60	3.68	4,070.16	-122.73	
16,462.00	89.98	0.00	11,891.15	3,992.45 N	989.70 W	508,506.85	725,531.60	3.68	4,072.15	-122.73	
16,464.00	89.94	359.94	11,891.15	3,994.45 N	989.70 W	508,508.85	725,531.60	3.68	4,074.14	-122.73	
16,466.00	89.90	359.88	11,891.15	3,996.45 N	989.71 W	508,510.85	725,531.59	3.68	4,076.13	-122.73	
16,468.00	89.86	359.82	11,891.16	3,998.45 N	989.71 W	508,512.85	725,531.59	3.68	4,078.12	-122.73	
16,470.00	89.82	359.76	11,891.16	4,000.45 N	989.72 W	508,514.85	725,531.58	3.68	4,080.11	-122.73	
16,472.00	89.78	359.69	11,891.17	4,002.45 N	989.73 W	508,516.85	725,531.57	3.68	4,082.10	-122.73	
16,474.00	89.74	359.63	11,891.18	4,004.45 N	989.74 W	508,518.85	725,531.56	3.68	4,084.09	-122.73	
16,476.00	89.70	359.57	11,891.19	4,006.45 N	989.75 W	508,520.85	725,531.55	3.68	4,086.08	-122.73	
16,478.00	89.66	359.51	11,891.20	4,008.45 N	989.77 W	508,522.85	725,531.53	3.68	4,088.07	-122.73	
16,480.00	89.62	359.45	11,891.21	4,010.45 N	989.79 W	508,524.85	725,531.51	3.68	4,090.07	-122.73	
16,482.00	89.58	359.38	11,891.23	4,012.45 N	989.81 W	508,526.85	725,531.49	3.68	4,092.06	-122.73	
16,484.00	89.54	359.32	11,891.24	4,014.45 N	989.83 W	508,528.85	725,531.47	3.68	4,094.05	-122.73	
16,486.00	89.50	359.26	11,891.26	4,016.45 N	989.86 W	508,530.85	725,531.44	3.68	4,096.04	-122.73	
16,488.00	89.46	359.20	11,891.28	4,018.45 N	989.88 W	508,532.85	725,531.42	3.68	4,098.03	-122.73	
16,490.00	89.42	359.14	11,891.30	4,020.45 N	989.91 W	508,534.85	725,531.39	3.68	4,100.03	-122.73	

HALLIBURTON

Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
16,492.00	89.38	359.07	11,891.32	4,022.45 N	989.94 W	508,536.85	725,531.36	3.68	4,102.02	-122.73	
16,494.00	89.34	359.01	11,891.34	4,024.45 N	989.98 W	508,538.85	725,531.32	3.68	4,104.01	-122.73	
16,496.00	89.30	358.95	11,891.37	4,026.45 N	990.01 W	508,540.85	725,531.29	3.68	4,106.00	-122.73	
16,498.00	89.30	358.92	11,891.39	4,028.45 N	990.05 W	508,542.85	725,531.25	1.33	4,108.00	-94.32	
16,500.00	89.33	358.93	11,891.41	4,030.45 N	990.09 W	508,544.85	725,531.21	1.85	4,109.99	14.19	
16,502.00	89.37	358.94	11,891.44	4,032.45 N	990.12 W	508,546.85	725,531.18	1.85	4,111.98	14.19	
16,504.00	89.41	358.95	11,891.46	4,034.45 N	990.16 W	508,548.85	725,531.14	1.85	4,113.98	14.19	
16,506.00	89.44	358.96	11,891.48	4,036.45 N	990.20 W	508,550.85	725,531.10	1.85	4,115.97	14.19	
16,508.00	89.48	358.97	11,891.50	4,038.45 N	990.23 W	508,552.85	725,531.07	1.85	4,117.96	14.19	
16,510.00	89.51	358.98	11,891.51	4,040.45 N	990.27 W	508,554.85	725,531.03	1.85	4,119.96	14.19	
16,512.00	89.55	358.99	11,891.53	4,042.45 N	990.31 W	508,556.85	725,530.99	1.85	4,121.95	14.19	
16,514.00	89.58	359.00	11,891.55	4,044.45 N	990.34 W	508,558.85	725,530.96	1.85	4,123.94	14.19	
16,516.00	89.62	359.01	11,891.56	4,046.44 N	990.38 W	508,560.84	725,530.92	1.85	4,125.93	14.19	
16,518.00	89.66	359.02	11,891.57	4,048.44 N	990.41 W	508,562.84	725,530.89	1.85	4,127.93	14.19	
16,520.00	89.69	359.02	11,891.58	4,050.44 N	990.44 W	508,564.84	725,530.86	1.85	4,129.92	14.19	
16,522.00	89.73	359.03	11,891.59	4,052.44 N	990.48 W	508,566.84	725,530.82	1.85	4,131.91	14.19	
16,524.00	89.76	359.04	11,891.60	4,054.44 N	990.51 W	508,568.84	725,530.79	1.85	4,133.91	14.19	
16,526.00	89.80	359.05	11,891.61	4,056.44 N	990.54 W	508,570.84	725,530.76	1.85	4,135.90	14.19	
16,528.00	89.83	359.06	11,891.62	4,058.44 N	990.58 W	508,572.84	725,530.72	1.85	4,137.89	14.19	
16,530.00	89.87	359.07	11,891.62	4,060.44 N	990.61 W	508,574.84	725,530.69	1.85	4,139.88	14.19	
16,532.00	89.91	359.08	11,891.63	4,062.44 N	990.64 W	508,576.84	725,530.66	1.85	4,141.88	14.19	
16,534.00	89.94	359.09	11,891.63	4,064.44 N	990.67 W	508,578.84	725,530.63	1.85	4,143.87	14.19	
16,536.00	89.98	359.10	11,891.63	4,066.44 N	990.71 W	508,580.84	725,530.59	1.85	4,145.86	14.19	
16,538.00	90.01	359.11	11,891.63	4,068.44 N	990.74 W	508,582.84	725,530.56	1.85	4,147.85	14.19	
16,540.00	90.05	359.11	11,891.63	4,070.44 N	990.77 W	508,584.84	725,530.53	1.85	4,149.85	14.19	
16,542.00	90.09	359.12	11,891.63	4,072.44 N	990.80 W	508,586.84	725,530.50	1.85	4,151.84	14.19	
16,544.00	90.12	359.13	11,891.62	4,074.44 N	990.83 W	508,588.84	725,530.47	1.85	4,153.83	14.19	
16,546.00	90.16	359.14	11,891.62	4,076.44 N	990.86 W	508,590.84	725,530.44	1.85	4,155.82	14.19	
16,548.00	90.19	359.15	11,891.61	4,078.44 N	990.89 W	508,592.84	725,530.41	1.85	4,157.82	14.19	
16,550.00	90.23	359.16	11,891.60	4,080.44 N	990.92 W	508,594.84	725,530.38	1.85	4,159.81	14.19	
16,552.00	90.26	359.17	11,891.60	4,082.44 N	990.95 W	508,596.84	725,530.35	1.85	4,161.80	14.19	
16,554.00	90.30	359.18	11,891.59	4,084.44 N	990.98 W	508,598.84	725,530.32	1.85	4,163.79	14.19	
16,556.00	90.34	359.19	11,891.58	4,086.44 N	991.01 W	508,600.84	725,530.29	1.85	4,165.79	14.19	
16,558.00	90.37	359.20	11,891.56	4,088.44 N	991.03 W	508,602.84	725,530.27	1.85	4,167.78	14.19	
16,560.00	90.41	359.21	11,891.55	4,090.44 N	991.06 W	508,604.84	725,530.24	1.85	4,169.77	14.19	
16,562.00	90.44	359.21	11,891.53	4,092.44 N	991.09 W	508,606.84	725,530.21	1.85	4,171.76	14.19	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
16,564.00	90.48	359.22	11,891.52	4,094.44 N	991.12 W	508,608.84	725,530.18	1.85	4,173.76	14.19	
16,566.00	90.51	359.23	11,891.50	4,096.44 N	991.14 W	508,610.84	725,530.16	1.85	4,175.75	14.19	
16,568.00	90.55	359.24	11,891.48	4,098.44 N	991.17 W	508,612.84	725,530.13	1.85	4,177.74	14.19	
16,570.00	90.59	359.25	11,891.46	4,100.44 N	991.20 W	508,614.84	725,530.10	1.85	4,179.73	14.19	
16,572.00	90.62	359.26	11,891.44	4,102.44 N	991.22 W	508,616.84	725,530.08	1.85	4,181.72	14.19	
16,574.00	90.66	359.27	11,891.42	4,104.44 N	991.25 W	508,618.84	725,530.05	1.85	4,183.72	14.19	
16,576.00	90.69	359.28	11,891.40	4,106.44 N	991.27 W	508,620.84	725,530.03	1.85	4,185.71	14.19	
16,578.00	90.73	359.29	11,891.37	4,108.44 N	991.30 W	508,622.84	725,530.00	1.85	4,187.70	14.19	
16,580.00	90.77	359.30	11,891.34	4,110.44 N	991.32 W	508,624.84	725,529.98	1.85	4,189.69	14.19	
16,582.00	90.80	359.30	11,891.32	4,112.44 N	991.35 W	508,626.84	725,529.95	1.85	4,191.68	14.19	
16,584.00	90.84	359.31	11,891.29	4,114.44 N	991.37 W	508,628.84	725,529.93	1.85	4,193.68	14.20	
16,586.00	90.87	359.32	11,891.26	4,116.44 N	991.40 W	508,630.84	725,529.90	1.85	4,195.67	14.20	
16,588.00	90.91	359.33	11,891.23	4,118.43 N	991.42 W	508,632.83	725,529.88	1.85	4,197.66	14.20	
16,590.00	90.94	359.34	11,891.20	4,120.43 N	991.44 W	508,634.83	725,529.86	1.85	4,199.65	14.20	
16,592.00	90.98	359.35	11,891.16	4,122.43 N	991.47 W	508,636.83	725,529.83	1.85	4,201.64	14.20	
16,594.00	90.97	359.39	11,891.13	4,124.43 N	991.49 W	508,638.83	725,529.81	1.88	4,203.63	100.98	
16,596.00	90.97	359.42	11,891.09	4,126.43 N	991.51 W	508,640.83	725,529.79	1.88	4,205.63	100.98	
16,598.00	90.96	359.46	11,891.06	4,128.43 N	991.53 W	508,642.83	725,529.77	1.88	4,207.62	100.98	
16,600.00	90.95	359.50	11,891.03	4,130.43 N	991.55 W	508,644.83	725,529.75	1.88	4,209.61	100.98	
16,602.00	90.94	359.53	11,890.99	4,132.43 N	991.56 W	508,646.83	725,529.74	1.88	4,211.60	100.99	
16,604.00	90.94	359.57	11,890.96	4,134.43 N	991.58 W	508,648.83	725,529.72	1.88	4,213.59	100.99	
16,606.00	90.93	359.61	11,890.93	4,136.43 N	991.59 W	508,650.83	725,529.71	1.88	4,215.58	100.99	
16,608.00	90.92	359.64	11,890.90	4,138.43 N	991.61 W	508,652.83	725,529.69	1.88	4,217.57	100.99	
16,610.00	90.92	359.68	11,890.86	4,140.43 N	991.62 W	508,654.83	725,529.68	1.88	4,219.56	100.99	
16,612.00	90.91	359.72	11,890.83	4,142.43 N	991.63 W	508,656.83	725,529.67	1.88	4,221.55	100.99	
16,614.00	90.90	359.76	11,890.80	4,144.43 N	991.64 W	508,658.83	725,529.66	1.88	4,223.54	100.99	
16,616.00	90.89	359.79	11,890.77	4,146.43 N	991.65 W	508,660.83	725,529.65	1.88	4,225.53	100.99	
16,618.00	90.89	359.83	11,890.74	4,148.43 N	991.65 W	508,662.83	725,529.65	1.88	4,227.52	100.99	
16,620.00	90.88	359.87	11,890.71	4,150.43 N	991.66 W	508,664.83	725,529.64	1.88	4,229.51	100.99	
16,622.00	90.87	359.90	11,890.68	4,152.43 N	991.66 W	508,666.83	725,529.64	1.88	4,231.50	100.99	
16,624.00	90.87	359.94	11,890.65	4,154.43 N	991.66 W	508,668.83	725,529.64	1.88	4,233.49	100.99	
16,626.00	90.86	359.98	11,890.62	4,156.43 N	991.67 W	508,670.83	725,529.63	1.88	4,235.48	100.99	
16,628.00	90.85	0.01	11,890.59	4,158.43 N	991.67 W	508,672.83	725,529.63	1.88	4,237.47	100.99	
16,630.00	90.84	0.05	11,890.56	4,160.43 N	991.66 W	508,674.83	725,529.64	1.88	4,239.46	100.99	
16,632.00	90.84	0.09	11,890.53	4,162.43 N	991.66 W	508,676.83	725,529.64	1.88	4,241.45	100.99	
16,634.00	90.83	0.12	11,890.50	4,164.43 N	991.66 W	508,678.83	725,529.64	1.88	4,243.44	100.99	
16,636.00	90.82	0.16	11,890.47	4,166.43 N	991.65 W	508,680.83	725,529.65	1.88	4,245.43	100.99	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates (usft)		Map Coordinates (usft)		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing	Easting	Northing	Easting				
16,638.00	90.82	0.20	11,890.44	4,168.43 N	991.65 W	508,682.83	725,529.65	1.88	4,247.42	101.00	
16,640.00	90.81	0.23	11,890.41	4,170.43 N	991.64 W	508,684.83	725,529.66	1.88	4,249.41	101.00	
16,642.00	90.80	0.27	11,890.38	4,172.43 N	991.63 W	508,686.83	725,529.67	1.88	4,251.40	101.00	
16,644.00	90.79	0.31	11,890.36	4,174.43 N	991.62 W	508,688.83	725,529.68	1.88	4,253.38	101.00	
16,646.00	90.79	0.34	11,890.33	4,176.43 N	991.61 W	508,690.83	725,529.69	1.88	4,255.37	101.00	
16,648.00	90.78	0.38	11,890.30	4,178.43 N	991.60 W	508,692.83	725,529.70	1.88	4,257.36	101.00	
16,650.00	90.77	0.42	11,890.27	4,180.43 N	991.58 W	508,694.83	725,529.72	1.88	4,259.35	101.00	
16,652.00	90.77	0.46	11,890.25	4,182.43 N	991.57 W	508,696.83	725,529.73	1.88	4,261.34	101.00	
16,654.00	90.76	0.49	11,890.22	4,184.43 N	991.55 W	508,698.83	725,529.75	1.88	4,263.32	101.00	
16,656.00	90.75	0.53	11,890.20	4,186.43 N	991.53 W	508,700.83	725,529.77	1.88	4,265.31	101.00	
16,658.00	90.74	0.57	11,890.17	4,188.43 N	991.51 W	508,702.83	725,529.79	1.88	4,267.30	101.00	
16,660.00	90.74	0.60	11,890.14	4,190.42 N	991.49 W	508,704.82	725,529.81	1.88	4,269.29	101.00	
16,662.00	90.73	0.64	11,890.12	4,192.42 N	991.47 W	508,706.82	725,529.83	1.88	4,271.27	101.00	
16,664.00	90.72	0.68	11,890.09	4,194.42 N	991.45 W	508,708.82	725,529.85	1.88	4,273.26	101.00	
16,666.00	90.72	0.71	11,890.07	4,196.42 N	991.42 W	508,710.82	725,529.88	1.88	4,275.25	101.00	
16,668.00	90.71	0.75	11,890.04	4,198.42 N	991.40 W	508,712.82	725,529.90	1.88	4,277.24	101.00	
16,670.00	90.70	0.79	11,890.02	4,200.42 N	991.37 W	508,714.82	725,529.93	1.88	4,279.22	101.00	
16,672.00	90.69	0.82	11,889.99	4,202.42 N	991.34 W	508,716.82	725,529.96	1.88	4,281.21	101.00	
16,674.00	90.69	0.86	11,889.97	4,204.42 N	991.32 W	508,718.82	725,529.98	1.88	4,283.19	101.00	
16,676.00	90.68	0.90	11,889.95	4,206.42 N	991.28 W	508,720.82	725,530.02	1.88	4,285.18	101.00	
16,678.00	90.67	0.93	11,889.92	4,208.42 N	991.25 W	508,722.82	725,530.05	1.88	4,287.17	101.01	
16,680.00	90.67	0.97	11,889.90	4,210.42 N	991.22 W	508,724.82	725,530.08	1.88	4,289.15	101.01	
16,682.00	90.66	1.01	11,889.88	4,212.42 N	991.18 W	508,726.82	725,530.12	1.88	4,291.14	101.01	
16,684.00	90.65	1.04	11,889.85	4,214.42 N	991.15 W	508,728.82	725,530.15	1.88	4,293.12	101.01	
16,686.00	90.64	1.08	11,889.83	4,216.42 N	991.11 W	508,730.82	725,530.19	1.88	4,295.11	101.01	
16,688.00	90.63	1.08	11,889.81	4,218.42 N	991.07 W	508,732.82	725,530.23	0.71	4,297.10	177.04	
16,690.00	90.61	1.05	11,889.79	4,220.42 N	991.04 W	508,734.82	725,530.26	2.06	4,299.08	-121.01	
16,692.00	90.59	1.01	11,889.77	4,222.42 N	991.00 W	508,736.82	725,530.30	2.06	4,301.07	-121.01	
16,694.00	90.57	0.98	11,889.75	4,224.42 N	990.97 W	508,738.82	725,530.33	2.06	4,303.05	-121.01	
16,696.00	90.54	0.94	11,889.73	4,226.42 N	990.93 W	508,740.82	725,530.37	2.06	4,305.04	-121.01	
16,698.00	90.52	0.91	11,889.71	4,228.42 N	990.90 W	508,742.82	725,530.40	2.06	4,307.02	-121.01	
16,700.00	90.50	0.87	11,889.69	4,230.42 N	990.87 W	508,744.82	725,530.43	2.06	4,309.01	-121.01	
16,702.00	90.48	0.83	11,889.67	4,232.42 N	990.84 W	508,746.82	725,530.46	2.06	4,311.00	-121.01	
16,704.00	90.46	0.80	11,889.66	4,234.42 N	990.81 W	508,748.82	725,530.49	2.06	4,312.98	-121.01	
16,706.00	90.44	0.76	11,889.64	4,236.42 N	990.78 W	508,750.82	725,530.52	2.06	4,314.97	-121.01	
16,708.00	90.42	0.73	11,889.63	4,238.42 N	990.76 W	508,752.82	725,530.54	2.06	4,316.96	-121.01	
16,710.00	90.40	0.69	11,889.61	4,240.42 N	990.73 W	508,754.82	725,530.57	2.06	4,318.94	-121.01	



Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
16,712.00	90.37	0.66	11,889.60	4,242.42 N	990.71 W	508,756.82	725,530.59	2.06	4,320.93	-121.01	
16,714.00	90.35	0.62	11,889.58	4,244.42 N	990.69 W	508,758.82	725,530.61	2.06	4,322.92	-121.01	
16,716.00	90.33	0.59	11,889.57	4,246.42 N	990.67 W	508,760.82	725,530.63	2.06	4,324.91	-121.01	
16,718.00	90.31	0.55	11,889.56	4,248.42 N	990.65 W	508,762.82	725,530.65	2.06	4,326.89	-121.01	
16,720.00	90.29	0.52	11,889.55	4,250.42 N	990.63 W	508,764.82	725,530.67	2.06	4,328.88	-121.01	
16,722.00	90.27	0.48	11,889.54	4,252.42 N	990.61 W	508,766.82	725,530.69	2.06	4,330.87	-121.01	
16,724.00	90.25	0.45	11,889.53	4,254.42 N	990.59 W	508,768.82	725,530.71	2.06	4,332.86	-121.01	
16,726.00	90.23	0.41	11,889.52	4,256.42 N	990.58 W	508,770.82	725,530.72	2.06	4,334.85	-121.01	
16,728.00	90.20	0.37	11,889.52	4,258.42 N	990.56 W	508,772.82	725,530.74	2.06	4,336.83	-121.02	
16,730.00	90.18	0.34	11,889.51	4,260.41 N	990.55 W	508,774.81	725,530.75	2.06	4,338.82	-121.02	
16,732.00	90.16	0.30	11,889.50	4,262.41 N	990.54 W	508,776.81	725,530.76	2.06	4,340.81	-121.02	
16,734.00	90.14	0.27	11,889.50	4,264.41 N	990.53 W	508,778.81	725,530.77	2.06	4,342.80	-121.02	
16,736.00	90.12	0.23	11,889.49	4,266.41 N	990.52 W	508,780.81	725,530.78	2.06	4,344.79	-121.02	
16,738.00	90.10	0.20	11,889.49	4,268.41 N	990.51 W	508,782.81	725,530.79	2.06	4,346.78	-121.02	
16,740.00	90.08	0.16	11,889.49	4,270.41 N	990.51 W	508,784.81	725,530.79	2.06	4,348.77	-121.02	
16,742.00	90.06	0.13	11,889.49	4,272.41 N	990.50 W	508,786.81	725,530.80	2.06	4,350.76	-121.02	
16,744.00	90.03	0.09	11,889.48	4,274.41 N	990.50 W	508,788.81	725,530.80	2.06	4,352.74	-121.02	
16,746.00	90.01	0.06	11,889.48	4,276.41 N	990.50 W	508,790.81	725,530.80	2.06	4,354.73	-121.02	
16,748.00	89.99	0.02	11,889.48	4,278.41 N	990.50 W	508,792.81	725,530.80	2.06	4,356.72	-121.02	
16,750.00	89.97	359.99	11,889.48	4,280.41 N	990.50 W	508,794.81	725,530.80	2.06	4,358.71	-121.02	
16,752.00	89.95	359.95	11,889.48	4,282.41 N	990.50 W	508,796.81	725,530.80	2.06	4,360.70	-121.02	
16,754.00	89.93	359.92	11,889.49	4,284.41 N	990.50 W	508,798.81	725,530.80	2.06	4,362.69	-121.02	
16,756.00	89.91	359.88	11,889.49	4,286.41 N	990.50 W	508,800.81	725,530.80	2.06	4,364.68	-121.02	
16,758.00	89.89	359.84	11,889.49	4,288.41 N	990.51 W	508,802.81	725,530.79	2.06	4,366.67	-121.02	
16,760.00	89.86	359.81	11,889.50	4,290.41 N	990.51 W	508,804.81	725,530.79	2.06	4,368.66	-121.02	
16,762.00	89.84	359.77	11,889.50	4,292.41 N	990.52 W	508,806.81	725,530.78	2.06	4,370.65	-121.02	
16,764.00	89.82	359.74	11,889.51	4,294.41 N	990.53 W	508,808.81	725,530.77	2.06	4,372.64	-121.02	
16,766.00	89.80	359.70	11,889.52	4,296.41 N	990.54 W	508,810.81	725,530.76	2.06	4,374.64	-121.02	
16,768.00	89.78	359.67	11,889.52	4,298.41 N	990.55 W	508,812.81	725,530.75	2.06	4,376.63	-121.02	
16,770.00	89.76	359.63	11,889.53	4,300.41 N	990.56 W	508,814.81	725,530.74	2.06	4,378.62	-121.02	
16,772.00	89.74	359.60	11,889.54	4,302.41 N	990.58 W	508,816.81	725,530.72	2.06	4,380.61	-121.01	
16,774.00	89.72	359.56	11,889.55	4,304.41 N	990.59 W	508,818.81	725,530.71	2.06	4,382.60	-121.01	
16,776.00	89.69	359.53	11,889.56	4,306.41 N	990.61 W	508,820.81	725,530.69	2.06	4,384.59	-121.01	
16,778.00	89.67	359.49	11,889.57	4,308.41 N	990.62 W	508,822.81	725,530.68	2.06	4,386.58	-121.01	
16,780.00	89.65	359.46	11,889.58	4,310.41 N	990.64 W	508,824.81	725,530.66	2.06	4,388.57	-121.01	
16,782.00	89.63	359.42	11,889.59	4,312.41 N	990.66 W	508,826.81	725,530.64	2.06	4,390.56	-121.01	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
16,784.00	89.65	359.48	11,889.61	4,314.41 N	990.68 W	508,828.81	725,530.62	3.07	4,392.56	66.72	
16,786.00	89.68	359.53	11,889.62	4,316.41 N	990.70 W	508,830.81	725,530.60	3.07	4,394.55	66.72	
16,788.00	89.70	359.59	11,889.63	4,318.41 N	990.71 W	508,832.81	725,530.59	3.07	4,396.54	66.72	
16,790.00	89.73	359.65	11,889.64	4,320.41 N	990.73 W	508,834.81	725,530.57	3.07	4,398.53	66.72	
16,792.00	89.75	359.70	11,889.65	4,322.41 N	990.74 W	508,836.81	725,530.56	3.07	4,400.52	66.72	
16,794.00	89.78	359.76	11,889.66	4,324.41 N	990.75 W	508,838.81	725,530.55	3.07	4,402.51	66.72	
16,796.00	89.80	359.81	11,889.66	4,326.41 N	990.76 W	508,840.81	725,530.54	3.07	4,404.50	66.72	
16,798.00	89.82	359.87	11,889.67	4,328.41 N	990.76 W	508,842.81	725,530.54	3.07	4,406.49	66.72	
16,800.00	89.85	359.93	11,889.68	4,330.41 N	990.76 W	508,844.81	725,530.54	3.07	4,408.48	66.72	
16,802.00	89.87	359.98	11,889.68	4,332.41 N	990.77 W	508,846.81	725,530.53	3.07	4,410.47	66.72	
16,804.00	89.90	0.04	11,889.69	4,334.41 N	990.77 W	508,848.81	725,530.53	3.07	4,412.46	66.72	
16,806.00	89.92	0.10	11,889.69	4,336.41 N	990.76 W	508,850.81	725,530.54	3.07	4,414.45	66.72	
16,808.00	89.95	0.15	11,889.69	4,338.41 N	990.76 W	508,852.81	725,530.54	3.07	4,416.44	66.72	
16,810.00	89.97	0.21	11,889.69	4,340.41 N	990.75 W	508,854.81	725,530.55	3.07	4,418.43	66.72	
16,812.00	89.99	0.27	11,889.69	4,342.41 N	990.74 W	508,856.81	725,530.56	3.07	4,420.42	66.72	
16,814.00	90.02	0.32	11,889.69	4,344.41 N	990.73 W	508,858.81	725,530.57	3.07	4,422.41	66.72	
16,816.00	90.04	0.38	11,889.69	4,346.41 N	990.72 W	508,860.81	725,530.58	3.07	4,424.40	66.72	
16,818.00	90.07	0.43	11,889.69	4,348.41 N	990.71 W	508,862.81	725,530.59	3.07	4,426.38	66.72	
16,820.00	90.09	0.49	11,889.69	4,350.41 N	990.69 W	508,864.81	725,530.61	3.07	4,428.37	66.72	
16,822.00	90.12	0.55	11,889.68	4,352.41 N	990.67 W	508,866.81	725,530.63	3.07	4,430.36	66.72	
16,824.00	90.14	0.60	11,889.68	4,354.41 N	990.65 W	508,868.81	725,530.65	3.07	4,432.35	66.72	
16,826.00	90.16	0.66	11,889.67	4,356.41 N	990.63 W	508,870.81	725,530.67	3.07	4,434.33	66.72	
16,828.00	90.19	0.72	11,889.67	4,358.41 N	990.61 W	508,872.81	725,530.69	3.07	4,436.32	66.72	
16,830.00	90.21	0.77	11,889.66	4,360.41 N	990.58 W	508,874.81	725,530.72	3.07	4,438.31	66.72	
16,832.00	90.24	0.83	11,889.65	4,362.41 N	990.55 W	508,876.81	725,530.75	3.07	4,440.30	66.72	
16,834.00	90.26	0.89	11,889.64	4,364.41 N	990.52 W	508,878.81	725,530.78	3.07	4,442.28	66.72	
16,836.00	90.28	0.94	11,889.64	4,366.41 N	990.49 W	508,880.81	725,530.81	3.07	4,444.27	66.72	
16,838.00	90.31	1.00	11,889.62	4,368.41 N	990.46 W	508,882.81	725,530.84	3.07	4,446.25	66.72	
16,840.00	90.33	1.06	11,889.61	4,370.41 N	990.42 W	508,884.81	725,530.88	3.07	4,448.24	66.72	
16,842.00	90.36	1.11	11,889.60	4,372.41 N	990.38 W	508,886.81	725,530.92	3.07	4,450.23	66.72	
16,844.00	90.38	1.17	11,889.59	4,374.41 N	990.34 W	508,888.81	725,530.96	3.07	4,452.21	66.72	
16,846.00	90.41	1.22	11,889.57	4,376.41 N	990.30 W	508,890.81	725,531.00	3.07	4,454.20	66.72	
16,848.00	90.43	1.28	11,889.56	4,378.41 N	990.26 W	508,892.81	725,531.04	3.07	4,456.18	66.72	
16,850.00	90.45	1.34	11,889.54	4,380.41 N	990.21 W	508,894.81	725,531.09	3.07	4,458.16	66.72	
16,852.00	90.48	1.39	11,889.53	4,382.41 N	990.16 W	508,896.81	725,531.14	3.07	4,460.15	66.72	
16,854.00	90.50	1.45	11,889.51	4,384.41 N	990.12 W	508,898.81	725,531.18	3.07	4,462.13	66.72	
16,856.00	90.53	1.51	11,889.49	4,386.41 N	990.06 W	508,900.81	725,531.24	3.07	4,464.12	66.72	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
16,858.00	90.55	1.56	11,889.47	4,388.41 N	990.01 W	508,902.81	725,531.29	3.07	4,466.10	66.73	
16,860.00	90.58	1.62	11,889.45	4,390.41 N	989.95 W	508,904.81	725,531.35	3.07	4,468.08	66.73	
16,862.00	90.60	1.68	11,889.43	4,392.40 N	989.90 W	508,906.80	725,531.40	3.07	4,470.07	66.73	
16,864.00	90.62	1.73	11,889.41	4,394.40 N	989.84 W	508,908.80	725,531.46	3.07	4,472.05	66.73	
16,866.00	90.65	1.79	11,889.39	4,396.40 N	989.78 W	508,910.80	725,531.52	3.07	4,474.03	66.73	
16,868.00	90.67	1.84	11,889.37	4,398.40 N	989.71 W	508,912.80	725,531.59	3.07	4,476.01	66.73	
16,870.00	90.70	1.90	11,889.34	4,400.40 N	989.65 W	508,914.80	725,531.65	3.07	4,478.00	66.73	
16,872.00	90.72	1.96	11,889.32	4,402.40 N	989.58 W	508,916.80	725,531.72	3.07	4,479.98	66.73	
16,874.00	90.75	2.01	11,889.29	4,404.40 N	989.51 W	508,918.80	725,531.79	3.07	4,481.96	66.73	
16,876.00	90.77	2.07	11,889.27	4,406.40 N	989.44 W	508,920.80	725,531.86	3.07	4,483.94	66.73	
16,878.00	90.75	2.01	11,889.24	4,408.39 N	989.37 W	508,922.79	725,531.93	3.08	4,485.92	-110.78	
16,880.00	90.73	1.95	11,889.21	4,410.39 N	989.30 W	508,924.79	725,532.00	3.08	4,487.90	-110.78	
16,882.00	90.70	1.90	11,889.19	4,412.39 N	989.23 W	508,926.79	725,532.07	3.08	4,489.88	-110.78	
16,884.00	90.68	1.84	11,889.17	4,414.39 N	989.17 W	508,928.79	725,532.13	3.08	4,491.87	-110.78	
16,886.00	90.66	1.78	11,889.14	4,416.39 N	989.10 W	508,930.79	725,532.20	3.08	4,493.85	-110.78	
16,888.00	90.64	1.72	11,889.12	4,418.39 N	989.04 W	508,932.79	725,532.26	3.08	4,495.83	-110.78	
16,890.00	90.62	1.67	11,889.10	4,420.39 N	988.98 W	508,934.79	725,532.32	3.08	4,497.81	-110.78	
16,892.00	90.59	1.61	11,889.08	4,422.39 N	988.93 W	508,936.79	725,532.37	3.08	4,499.80	-110.78	
16,894.00	90.57	1.55	11,889.06	4,424.39 N	988.87 W	508,938.79	725,532.43	3.08	4,501.78	-110.78	
16,896.00	90.55	1.49	11,889.04	4,426.38 N	988.82 W	508,940.78	725,532.48	3.08	4,503.76	-110.78	
16,898.00	90.53	1.44	11,889.02	4,428.38 N	988.77 W	508,942.78	725,532.53	3.08	4,505.75	-110.78	
16,900.00	90.51	1.38	11,889.00	4,430.38 N	988.72 W	508,944.78	725,532.58	3.08	4,507.73	-110.78	
16,902.00	90.49	1.32	11,888.98	4,432.38 N	988.67 W	508,946.78	725,532.63	3.08	4,509.72	-110.78	
16,904.00	90.46	1.26	11,888.97	4,434.38 N	988.63 W	508,948.78	725,532.67	3.08	4,511.70	-110.78	
16,906.00	90.44	1.20	11,888.95	4,436.38 N	988.58 W	508,950.78	725,532.72	3.08	4,513.68	-110.78	
16,908.00	90.42	1.15	11,888.93	4,438.38 N	988.54 W	508,952.78	725,532.76	3.08	4,515.67	-110.78	
16,910.00	90.40	1.09	11,888.92	4,440.38 N	988.50 W	508,954.78	725,532.80	3.08	4,517.65	-110.78	
16,912.00	90.38	1.03	11,888.91	4,442.38 N	988.47 W	508,956.78	725,532.83	3.08	4,519.64	-110.79	
16,914.00	90.35	0.97	11,888.89	4,444.38 N	988.43 W	508,958.78	725,532.87	3.08	4,521.63	-110.79	
16,916.00	90.33	0.92	11,888.88	4,446.38 N	988.40 W	508,960.78	725,532.90	3.08	4,523.61	-110.79	
16,918.00	90.31	0.86	11,888.87	4,448.38 N	988.37 W	508,962.78	725,532.93	3.08	4,525.60	-110.79	
16,920.00	90.29	0.80	11,888.86	4,450.38 N	988.34 W	508,964.78	725,532.96	3.08	4,527.59	-110.79	
16,922.00	90.27	0.74	11,888.85	4,452.38 N	988.31 W	508,966.78	725,532.99	3.08	4,529.57	-110.79	
16,924.00	90.24	0.69	11,888.84	4,454.38 N	988.29 W	508,968.78	725,533.01	3.08	4,531.56	-110.79	
16,926.00	90.22	0.63	11,888.83	4,456.38 N	988.26 W	508,970.78	725,533.04	3.08	4,533.55	-110.79	
16,928.00	90.20	0.57	11,888.83	4,458.38 N	988.24 W	508,972.78	725,533.06	3.08	4,535.53	-110.79	
16,930.00	90.18	0.51	11,888.82	4,460.38 N	988.22 W	508,974.78	725,533.08	3.08	4,537.52	-110.79	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
16,932.00	90.16	0.45	11,888.81	4,462.38 N	988.21 W	508,976.78	725,533.09	3.08	4,539.51	-110.79	
16,934.00	90.14	0.40	11,888.81	4,464.38 N	988.19 W	508,978.78	725,533.11	3.08	4,541.50	-110.79	
16,936.00	90.11	0.34	11,888.80	4,466.38 N	988.18 W	508,980.78	725,533.12	3.08	4,543.49	-110.79	
16,938.00	90.09	0.28	11,888.80	4,468.38 N	988.17 W	508,982.78	725,533.13	3.08	4,545.47	-110.79	
16,940.00	90.07	0.22	11,888.80	4,470.38 N	988.16 W	508,984.78	725,533.14	3.08	4,547.46	-110.79	
16,942.00	90.05	0.17	11,888.80	4,472.38 N	988.15 W	508,986.78	725,533.15	3.08	4,549.45	-110.79	
16,944.00	90.03	0.11	11,888.79	4,474.38 N	988.15 W	508,988.78	725,533.15	3.08	4,551.44	-110.79	
16,946.00	90.00	0.05	11,888.79	4,476.38 N	988.14 W	508,990.78	725,533.16	3.08	4,553.43	-110.79	
16,948.00	89.98	359.99	11,888.79	4,478.38 N	988.14 W	508,992.78	725,533.16	3.08	4,555.42	-110.79	
16,950.00	89.96	359.94	11,888.80	4,480.38 N	988.14 W	508,994.78	725,533.16	3.08	4,557.41	-110.79	
16,952.00	89.94	359.88	11,888.80	4,482.38 N	988.15 W	508,996.78	725,533.15	3.08	4,559.40	-110.79	
16,954.00	89.92	359.82	11,888.80	4,484.38 N	988.15 W	508,998.78	725,533.15	3.08	4,561.39	-110.79	
16,956.00	89.89	359.76	11,888.80	4,486.38 N	988.16 W	509,000.78	725,533.14	3.08	4,563.38	-110.79	
16,958.00	89.87	359.70	11,888.81	4,488.38 N	988.17 W	509,002.78	725,533.13	3.08	4,565.37	-110.79	
16,960.00	89.85	359.65	11,888.81	4,490.38 N	988.18 W	509,004.78	725,533.12	3.08	4,567.36	-110.79	
16,962.00	89.83	359.59	11,888.82	4,492.38 N	988.19 W	509,006.78	725,533.11	3.08	4,569.35	-110.79	
16,964.00	89.81	359.53	11,888.82	4,494.38 N	988.21 W	509,008.78	725,533.09	3.08	4,571.34	-110.79	
16,966.00	89.78	359.47	11,888.83	4,496.38 N	988.23 W	509,010.78	725,533.07	3.08	4,573.34	-110.79	
16,968.00	89.76	359.42	11,888.84	4,498.38 N	988.25 W	509,012.78	725,533.05	3.08	4,575.33	-110.79	
16,970.00	89.74	359.36	11,888.85	4,500.38 N	988.27 W	509,014.78	725,533.03	3.08	4,577.32	-110.79	
16,972.00	89.73	359.28	11,888.86	4,502.38 N	988.29 W	509,016.78	725,533.01	3.93	4,579.31	-96.39	
16,974.00	89.74	359.18	11,888.87	4,504.38 N	988.32 W	509,018.78	725,532.98	4.93	4,581.30	-87.44	
16,976.00	89.74	359.08	11,888.88	4,506.38 N	988.35 W	509,020.78	725,532.95	4.93	4,583.30	-87.44	
16,978.00	89.75	358.99	11,888.88	4,508.38 N	988.38 W	509,022.78	725,532.92	4.93	4,585.29	-87.44	
16,980.00	89.75	358.89	11,888.89	4,510.38 N	988.42 W	509,024.78	725,532.88	4.93	4,587.28	-87.44	
16,982.00	89.75	358.79	11,888.90	4,512.38 N	988.46 W	509,026.78	725,532.84	4.93	4,589.28	-87.44	
16,984.00	89.76	358.69	11,888.91	4,514.38 N	988.50 W	509,028.78	725,532.80	4.93	4,591.27	-87.44	
16,986.00	89.76	358.59	11,888.92	4,516.37 N	988.55 W	509,030.77	725,532.75	4.93	4,593.26	-87.44	
16,988.00	89.77	358.49	11,888.93	4,518.37 N	988.60 W	509,032.77	725,532.70	4.93	4,595.26	-87.44	
16,990.00	89.77	358.39	11,888.93	4,520.37 N	988.66 W	509,034.77	725,532.64	4.93	4,597.25	-87.44	
16,992.00	89.78	358.30	11,888.94	4,522.37 N	988.71 W	509,036.77	725,532.59	4.93	4,599.25	-87.43	
16,994.00	89.78	358.20	11,888.95	4,524.37 N	988.78 W	509,038.77	725,532.52	4.93	4,601.24	-87.43	
16,996.00	89.79	358.10	11,888.96	4,526.37 N	988.84 W	509,040.77	725,532.46	4.93	4,603.24	-87.43	
16,998.00	89.79	358.00	11,888.97	4,528.37 N	988.91 W	509,042.77	725,532.39	4.93	4,605.23	-87.43	
17,000.00	89.79	357.90	11,888.97	4,530.37 N	988.98 W	509,044.77	725,532.32	4.93	4,607.23	-87.43	
17,002.00	89.80	357.80	11,888.98	4,532.37 N	989.05 W	509,046.77	725,532.25	4.93	4,609.22	-87.43	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
17,004.00	89.80	357.70	11,888.99	4,534.36 N	989.13 W	509,048.76	725,532.17	4.93	4,611.22	-87.43	
17,006.00	89.81	357.61	11,888.99	4,536.36 N	989.21 W	509,050.76	725,532.09	4.93	4,613.22	-87.43	
17,008.00	89.81	357.51	11,889.00	4,538.36 N	989.30 W	509,052.76	725,532.00	4.93	4,615.21	-87.43	
17,010.00	89.82	357.41	11,889.01	4,540.36 N	989.39 W	509,054.76	725,531.91	4.93	4,617.21	-87.43	
17,012.00	89.82	357.31	11,889.01	4,542.36 N	989.48 W	509,056.76	725,531.82	4.93	4,619.21	-87.43	
17,014.00	89.82	357.21	11,889.02	4,544.35 N	989.58 W	509,058.75	725,531.72	4.93	4,621.20	-87.43	
17,016.00	89.83	357.11	11,889.03	4,546.35 N	989.68 W	509,060.75	725,531.62	4.93	4,623.20	-87.43	
17,018.00	89.83	357.01	11,889.03	4,548.35 N	989.78 W	509,062.75	725,531.52	4.93	4,625.20	-87.43	
17,020.00	89.84	356.92	11,889.04	4,550.35 N	989.88 W	509,064.75	725,531.42	4.93	4,627.20	-87.43	
17,022.00	89.84	356.82	11,889.04	4,552.34 N	989.99 W	509,066.74	725,531.31	4.93	4,629.19	-87.43	
17,024.00	89.85	356.72	11,889.05	4,554.34 N	990.11 W	509,068.74	725,531.19	4.93	4,631.19	-87.43	
17,026.00	89.85	356.62	11,889.05	4,556.34 N	990.22 W	509,070.74	725,531.08	4.93	4,633.19	-87.43	
17,028.00	89.86	356.52	11,889.06	4,558.33 N	990.34 W	509,072.73	725,530.96	4.93	4,635.19	-87.43	
17,030.00	89.86	356.42	11,889.06	4,560.33 N	990.46 W	509,074.73	725,530.84	4.93	4,637.19	-87.43	
17,032.00	89.86	356.32	11,889.07	4,562.33 N	990.59 W	509,076.73	725,530.71	4.93	4,639.19	-87.43	
17,034.00	89.87	356.23	11,889.07	4,564.32 N	990.72 W	509,078.72	725,530.58	4.93	4,641.18	-87.43	
17,036.00	89.87	356.13	11,889.08	4,566.32 N	990.85 W	509,080.72	725,530.45	4.93	4,643.18	-87.43	
17,038.00	89.88	356.03	11,889.08	4,568.31 N	990.99 W	509,082.71	725,530.31	4.93	4,645.18	-87.43	
17,040.00	89.88	355.93	11,889.09	4,570.31 N	991.13 W	509,084.71	725,530.17	4.93	4,647.18	-87.43	
17,042.00	89.89	355.83	11,889.09	4,572.30 N	991.28 W	509,086.70	725,530.02	4.93	4,649.18	-87.43	
17,044.00	89.89	355.73	11,889.09	4,574.30 N	991.42 W	509,088.70	725,529.88	4.93	4,651.18	-87.43	
17,046.00	89.90	355.64	11,889.10	4,576.29 N	991.57 W	509,090.69	725,529.73	4.93	4,653.18	-87.43	
17,048.00	89.90	355.54	11,889.10	4,578.29 N	991.73 W	509,092.69	725,529.57	4.93	4,655.18	-87.43	
17,050.00	89.90	355.44	11,889.10	4,580.28 N	991.88 W	509,094.68	725,529.42	4.93	4,657.18	-87.43	
17,052.00	89.91	355.34	11,889.11	4,582.27 N	992.04 W	509,096.67	725,529.26	4.93	4,659.18	-87.43	
17,054.00	89.91	355.24	11,889.11	4,584.27 N	992.21 W	509,098.67	725,529.09	4.93	4,661.18	-87.43	
17,056.00	89.92	355.14	11,889.11	4,586.26 N	992.38 W	509,100.66	725,528.92	4.93	4,663.18	-87.43	
17,058.00	89.92	355.04	11,889.12	4,588.25 N	992.55 W	509,102.65	725,528.75	4.93	4,665.18	-87.43	
17,060.00	89.93	354.95	11,889.12	4,590.24 N	992.72 W	509,104.64	725,528.58	4.93	4,667.18	-87.43	
17,062.00	89.93	354.85	11,889.12	4,592.24 N	992.90 W	509,106.64	725,528.40	4.93	4,669.18	-87.43	
17,064.00	89.94	354.75	11,889.12	4,594.23 N	993.08 W	509,108.63	725,528.22	4.93	4,671.18	-87.43	
17,066.00	89.94	354.65	11,889.13	4,596.22 N	993.27 W	509,110.62	725,528.03	4.93	4,673.18	-87.43	
17,068.00	89.94	354.64	11,889.13	4,598.21 N	993.45 W	509,112.61	725,527.85	0.49	4,675.18	-74.74	
17,070.00	89.95	354.63	11,889.13	4,600.20 N	993.64 W	509,114.60	725,527.66	0.49	4,677.18	-74.74	
17,072.00	89.95	354.62	11,889.13	4,602.19 N	993.83 W	509,116.59	725,527.47	0.49	4,679.17	-74.74	
17,074.00	89.95	354.61	11,889.13	4,604.18 N	994.01 W	509,118.58	725,527.29	0.49	4,681.17	-74.74	
17,076.00	89.95	354.60	11,889.14	4,606.18 N	994.20 W	509,120.58	725,527.10	0.49	4,683.17	-74.74	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates (usft)		Map Coordinates (usft)		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing	Easting	Northing	Easting				
17,078.00	89.96	354.59	11,889.14	4,608.17 N	994.39 W	509,122.57	725,526.91	0.49	4,685.17	-74.74	
17,080.00	89.96	354.58	11,889.14	4,610.16 N	994.58 W	509,124.56	725,526.72	0.49	4,687.17	-74.74	
17,082.00	89.96	354.58	11,889.14	4,612.15 N	994.77 W	509,126.55	725,526.53	0.49	4,689.17	-74.74	
17,084.00	89.96	354.57	11,889.14	4,614.14 N	994.96 W	509,128.54	725,526.34	0.49	4,691.17	-74.74	
17,086.00	89.97	354.56	11,889.14	4,616.13 N	995.15 W	509,130.53	725,526.15	0.49	4,693.17	-74.74	
17,088.00	89.97	354.55	11,889.14	4,618.12 N	995.34 W	509,132.52	725,525.96	0.49	4,695.17	-74.74	
17,090.00	89.97	354.54	11,889.14	4,620.11 N	995.53 W	509,134.51	725,525.77	0.49	4,697.17	-74.74	
17,092.00	89.97	354.53	11,889.15	4,622.10 N	995.72 W	509,136.50	725,525.58	0.49	4,699.17	-74.74	
17,094.00	89.98	354.52	11,889.15	4,624.09 N	995.91 W	509,138.49	725,525.39	0.49	4,701.17	-74.74	
17,096.00	89.98	354.51	11,889.15	4,626.09 N	996.10 W	509,140.49	725,525.20	0.49	4,703.17	-74.74	
17,098.00	89.98	354.50	11,889.15	4,628.08 N	996.29 W	509,142.48	725,525.01	0.49	4,705.17	-74.74	
17,100.00	89.98	354.49	11,889.15	4,630.07 N	996.48 W	509,144.47	725,524.82	0.49	4,707.17	-74.74	
17,102.00	89.99	354.48	11,889.15	4,632.06 N	996.68 W	509,146.46	725,524.62	0.49	4,709.17	-74.74	
17,104.00	89.99	354.47	11,889.15	4,634.05 N	996.87 W	509,148.45	725,524.43	0.49	4,711.17	-74.74	
17,106.00	89.99	354.46	11,889.15	4,636.04 N	997.06 W	509,150.44	725,524.24	0.49	4,713.17	-74.74	
17,108.00	89.99	354.45	11,889.15	4,638.03 N	997.25 W	509,152.43	725,524.05	0.49	4,715.17	-74.74	
17,110.00	90.00	354.44	11,889.15	4,640.02 N	997.45 W	509,154.42	725,523.85	0.49	4,717.17	-74.74	
17,112.00	90.00	354.43	11,889.15	4,642.01 N	997.64 W	509,156.41	725,523.66	0.49	4,719.17	-74.74	
17,114.00	90.00	354.43	11,889.15	4,644.00 N	997.84 W	509,158.40	725,523.46	0.49	4,721.17	-74.74	
17,116.00	90.00	354.42	11,889.15	4,645.99 N	998.03 W	509,160.39	725,523.27	0.49	4,723.17	-74.74	
17,118.00	90.01	354.41	11,889.15	4,647.98 N	998.22 W	509,162.38	725,523.08	0.49	4,725.17	-74.74	
17,120.00	90.01	354.40	11,889.15	4,649.97 N	998.42 W	509,164.37	725,522.88	0.49	4,727.17	-74.74	
17,122.00	90.01	354.39	11,889.15	4,651.96 N	998.62 W	509,166.36	725,522.68	0.49	4,729.17	-74.74	
17,124.00	90.01	354.38	11,889.15	4,653.95 N	998.81 W	509,168.35	725,522.49	0.49	4,731.17	-74.74	
17,126.00	90.02	354.37	11,889.15	4,655.94 N	999.01 W	509,170.34	725,522.29	0.49	4,733.17	-74.74	
17,128.00	90.02	354.36	11,889.15	4,657.93 N	999.20 W	509,172.33	725,522.10	0.49	4,735.17	-74.74	
17,130.00	90.02	354.35	11,889.15	4,659.92 N	999.40 W	509,174.32	725,521.90	0.49	4,737.17	-74.74	
17,132.00	90.02	354.34	11,889.15	4,661.91 N	999.60 W	509,176.31	725,521.70	0.49	4,739.17	-74.74	
17,134.00	90.03	354.33	11,889.15	4,663.91 N	999.79 W	509,178.31	725,521.51	0.49	4,741.17	-74.74	
17,136.00	90.03	354.32	11,889.14	4,665.90 N	999.99 W	509,180.30	725,521.31	0.49	4,743.17	-74.74	
17,138.00	90.03	354.31	11,889.14	4,667.89 N	1,000.19 W	509,182.29	725,521.11	0.49	4,745.17	-74.74	
17,140.00	90.03	354.30	11,889.14	4,669.88 N	1,000.39 W	509,184.28	725,520.91	0.49	4,747.17	-74.74	
17,142.00	90.04	354.29	11,889.14	4,671.87 N	1,000.59 W	509,186.27	725,520.71	0.49	4,749.17	-74.74	
17,144.00	90.04	354.28	11,889.14	4,673.86 N	1,000.79 W	509,188.26	725,520.51	0.49	4,751.17	-74.74	
17,146.00	90.04	354.28	11,889.14	4,675.85 N	1,000.99 W	509,190.25	725,520.31	0.49	4,753.17	-74.74	
17,148.00	90.04	354.27	11,889.14	4,677.84 N	1,001.19 W	509,192.24	725,520.11	0.49	4,755.17	-74.74	
17,150.00	90.05	354.26	11,889.14	4,679.83 N	1,001.39 W	509,194.23	725,519.91	0.49	4,757.17	-74.74	



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Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
17,152.00	90.05	354.25	11,889.13	4,681.82 N	1,001.59 W	509,196.22	725,519.71	0.49	4,759.17	-74.74	
17,154.00	90.05	354.24	11,889.13	4,683.81 N	1,001.79 W	509,198.21	725,519.51	0.49	4,761.17	-74.74	
17,156.00	90.05	354.23	11,889.13	4,685.80 N	1,001.99 W	509,200.20	725,519.31	0.49	4,763.17	-74.74	
17,158.00	90.06	354.22	11,889.13	4,687.79 N	1,002.19 W	509,202.19	725,519.11	0.49	4,765.17	-74.74	
17,160.00	90.06	354.21	11,889.13	4,689.78 N	1,002.39 W	509,204.18	725,518.91	0.49	4,767.17	-74.74	
17,162.00	90.05	354.24	11,889.12	4,691.77 N	1,002.59 W	509,206.17	725,518.71	1.75	4,769.17	98.47	
17,164.00	90.05	354.28	11,889.12	4,693.76 N	1,002.79 W	509,208.16	725,518.51	1.75	4,771.17	98.47	
17,166.00	90.04	354.31	11,889.12	4,695.75 N	1,002.99 W	509,210.15	725,518.31	1.75	4,773.17	98.47	
17,168.00	90.04	354.35	11,889.12	4,697.74 N	1,003.19 W	509,212.14	725,518.11	1.75	4,775.17	98.47	
17,170.00	90.03	354.38	11,889.12	4,699.73 N	1,003.38 W	509,214.13	725,517.92	1.75	4,777.17	98.47	
17,172.00	90.03	354.42	11,889.12	4,701.72 N	1,003.58 W	509,216.12	725,517.72	1.75	4,779.17	98.47	
17,174.00	90.02	354.45	11,889.12	4,703.71 N	1,003.77 W	509,218.11	725,517.53	1.75	4,781.17	98.47	
17,176.00	90.02	354.49	11,889.11	4,705.70 N	1,003.97 W	509,220.10	725,517.33	1.75	4,783.17	98.47	
17,178.00	90.01	354.52	11,889.11	4,707.69 N	1,004.16 W	509,222.09	725,517.14	1.75	4,785.17	98.47	
17,180.00	90.01	354.56	11,889.11	4,709.68 N	1,004.35 W	509,224.08	725,516.95	1.75	4,787.17	98.47	
17,182.00	90.00	354.59	11,889.11	4,711.67 N	1,004.54 W	509,226.07	725,516.76	1.75	4,789.17	98.47	
17,184.00	90.00	354.63	11,889.11	4,713.66 N	1,004.72 W	509,228.06	725,516.58	1.75	4,791.17	98.47	
17,186.00	89.99	354.66	11,889.11	4,715.65 N	1,004.91 W	509,230.05	725,516.39	1.75	4,793.17	98.47	
17,188.00	89.99	354.69	11,889.11	4,717.64 N	1,005.10 W	509,232.04	725,516.20	1.75	4,795.17	98.47	
17,190.00	89.98	354.73	11,889.11	4,719.64 N	1,005.28 W	509,234.04	725,516.02	1.75	4,797.17	98.47	
17,192.00	89.98	354.76	11,889.12	4,721.63 N	1,005.46 W	509,236.03	725,515.84	1.75	4,799.17	98.47	
17,194.00	89.97	354.80	11,889.12	4,723.62 N	1,005.65 W	509,238.02	725,515.65	1.75	4,801.17	98.47	
17,196.00	89.97	354.83	11,889.12	4,725.61 N	1,005.83 W	509,240.01	725,515.47	1.75	4,803.17	98.47	
17,198.00	89.96	354.87	11,889.12	4,727.60 N	1,006.01 W	509,242.00	725,515.29	1.75	4,805.17	98.47	
17,200.00	89.96	354.90	11,889.12	4,729.59 N	1,006.18 W	509,243.99	725,515.12	1.75	4,807.17	98.47	
17,202.00	89.95	354.94	11,889.12	4,731.59 N	1,006.36 W	509,245.99	725,514.94	1.75	4,809.17	98.47	
17,204.00	89.95	354.97	11,889.12	4,733.58 N	1,006.54 W	509,247.98	725,514.76	1.75	4,811.17	98.47	
17,206.00	89.94	355.01	11,889.13	4,735.57 N	1,006.71 W	509,249.97	725,514.59	1.75	4,813.17	98.47	
17,208.00	89.94	355.04	11,889.13	4,737.56 N	1,006.89 W	509,251.96	725,514.41	1.75	4,815.17	98.47	
17,210.00	89.93	355.08	11,889.13	4,739.56 N	1,007.06 W	509,253.96	725,514.24	1.75	4,817.17	98.47	
17,212.00	89.93	355.11	11,889.13	4,741.55 N	1,007.23 W	509,255.95	725,514.07	1.75	4,819.17	98.47	
17,214.00	89.92	355.15	11,889.14	4,743.54 N	1,007.40 W	509,257.94	725,513.90	1.75	4,821.17	98.47	
17,216.00	89.92	355.18	11,889.14	4,745.53 N	1,007.57 W	509,259.93	725,513.73	1.75	4,823.17	98.47	
17,218.00	89.91	355.21	11,889.14	4,747.53 N	1,007.74 W	509,261.93	725,513.56	1.75	4,825.17	98.47	
17,220.00	89.91	355.25	11,889.14	4,749.52 N	1,007.90 W	509,263.92	725,513.40	1.75	4,827.17	98.47	
17,222.00	89.90	355.28	11,889.15	4,751.51 N	1,008.07 W	509,265.91	725,513.23	1.75	4,829.17	98.47	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
17,224.00	89.89	355.32	11,889.15	4,753.51 N	1,008.23 W	509,267.91	725,513.07	1.75	4,831.17	98.47	
17,226.00	89.89	355.35	11,889.15	4,755.50 N	1,008.39 W	509,269.90	725,512.91	1.75	4,833.17	98.47	
17,228.00	89.88	355.39	11,889.16	4,757.49 N	1,008.55 W	509,271.89	725,512.75	1.75	4,835.17	98.47	
17,230.00	89.88	355.42	11,889.16	4,759.49 N	1,008.71 W	509,273.89	725,512.59	1.75	4,837.17	98.47	
17,232.00	89.87	355.46	11,889.17	4,761.48 N	1,008.87 W	509,275.88	725,512.43	1.75	4,839.17	98.47	
17,234.00	89.87	355.49	11,889.17	4,763.48 N	1,009.03 W	509,277.88	725,512.27	1.75	4,841.17	98.47	
17,236.00	89.86	355.53	11,889.18	4,765.47 N	1,009.19 W	509,279.87	725,512.11	1.75	4,843.17	98.47	
17,238.00	89.86	355.56	11,889.18	4,767.46 N	1,009.34 W	509,281.86	725,511.96	1.75	4,845.17	98.47	
17,240.00	89.85	355.60	11,889.19	4,769.46 N	1,009.50 W	509,283.86	725,511.80	1.75	4,847.17	98.47	
17,242.00	89.85	355.63	11,889.19	4,771.45 N	1,009.65 W	509,285.85	725,511.65	1.75	4,849.17	98.47	
17,244.00	89.84	355.66	11,889.20	4,773.45 N	1,009.80 W	509,287.85	725,511.50	1.75	4,851.16	98.47	
17,246.00	89.84	355.70	11,889.20	4,775.44 N	1,009.95 W	509,289.84	725,511.35	1.75	4,853.16	98.47	
17,248.00	89.83	355.73	11,889.21	4,777.43 N	1,010.10 W	509,291.83	725,511.20	1.75	4,855.16	98.47	
17,250.00	89.83	355.77	11,889.21	4,779.43 N	1,010.25 W	509,293.83	725,511.05	1.75	4,857.16	98.47	
17,252.00	89.82	355.80	11,889.22	4,781.42 N	1,010.40 W	509,295.82	725,510.90	1.75	4,859.16	98.47	
17,254.00	89.82	355.84	11,889.23	4,783.42 N	1,010.54 W	509,297.82	725,510.76	1.75	4,861.16	98.47	
17,256.00	89.81	355.87	11,889.23	4,785.41 N	1,010.69 W	509,299.81	725,510.61	1.75	4,863.16	98.47	
17,258.00	89.81	355.91	11,889.24	4,787.41 N	1,010.83 W	509,301.81	725,510.47	1.75	4,865.16	98.47	
17,260.00	89.80	355.94	11,889.25	4,789.40 N	1,010.97 W	509,303.80	725,510.33	1.75	4,867.16	98.47	
17,262.00	89.80	355.98	11,889.25	4,791.40 N	1,011.11 W	509,305.80	725,510.19	1.75	4,869.16	98.47	
17,264.00	89.79	356.01	11,889.26	4,793.39 N	1,011.25 W	509,307.79	725,510.05	1.75	4,871.16	98.47	
17,266.00	89.79	356.05	11,889.27	4,795.39 N	1,011.39 W	509,309.79	725,509.91	1.75	4,873.16	98.47	
17,268.00	89.78	356.08	11,889.28	4,797.38 N	1,011.53 W	509,311.78	725,509.77	1.75	4,875.15	98.47	
17,270.00	89.78	356.11	11,889.28	4,799.38 N	1,011.67 W	509,313.78	725,509.63	1.75	4,877.15	98.47	
17,272.00	89.77	356.15	11,889.29	4,801.37 N	1,011.80 W	509,315.77	725,509.50	1.75	4,879.15	98.47	
17,274.00	89.77	356.18	11,889.30	4,803.37 N	1,011.93 W	509,317.77	725,509.37	1.75	4,881.15	98.47	
17,276.00	89.76	356.22	11,889.31	4,805.36 N	1,012.07 W	509,319.76	725,509.23	1.75	4,883.15	98.47	
17,278.00	89.76	356.25	11,889.32	4,807.36 N	1,012.20 W	509,321.76	725,509.10	1.75	4,885.15	98.47	SLC @ 17,278'MD
17,280.00	89.75	356.29	11,889.32	4,809.36 N	1,012.33 W	509,323.76	725,508.97	1.75	4,887.15	98.47	
17,282.00	89.75	356.32	11,889.33	4,811.35 N	1,012.46 W	509,325.75	725,508.84	1.75	4,889.15	98.47	
17,284.00	89.74	356.36	11,889.34	4,813.35 N	1,012.59 W	509,327.75	725,508.71	1.75	4,891.14	98.47	
17,286.00	89.73	356.39	11,889.35	4,815.34 N	1,012.71 W	509,329.74	725,508.59	1.75	4,893.14	98.47	
17,288.00	89.73	356.43	11,889.36	4,817.34 N	1,012.84 W	509,331.74	725,508.46	1.75	4,895.14	98.47	
17,290.00	89.72	356.46	11,889.37	4,819.34 N	1,012.96 W	509,333.74	725,508.34	1.75	4,897.14	98.47	
17,292.00	89.72	356.50	11,889.38	4,821.33 N	1,013.08 W	509,335.73	725,508.22	1.75	4,899.14	98.47	
17,294.00	89.71	356.53	11,889.39	4,823.33 N	1,013.21 W	509,337.73	725,508.09	1.75	4,901.14	98.47	
17,296.00	89.71	356.56	11,889.40	4,825.32 N	1,013.33 W	509,339.72	725,507.97	1.75	4,903.13	98.47	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
17,298.00	89.70	356.60	11,889.41	4,827.32 N	1,013.45 W	509,341.72	725,507.85	1.75	4,905.13	98.47	
17,300.00	89.70	356.63	11,889.42	4,829.32 N	1,013.56 W	509,343.72	725,507.74	1.75	4,907.13	98.47	
17,302.00	89.69	356.67	11,889.43	4,831.31 N	1,013.68 W	509,345.71	725,507.62	1.75	4,909.13	98.47	
17,304.00	89.69	356.70	11,889.44	4,833.31 N	1,013.80 W	509,347.71	725,507.50	1.75	4,911.13	98.47	
17,306.00	89.68	356.74	11,889.45	4,835.31 N	1,013.91 W	509,349.71	725,507.39	1.75	4,913.12	98.47	
17,308.00	89.68	356.77	11,889.46	4,837.30 N	1,014.02 W	509,351.70	725,507.28	1.75	4,915.12	98.47	
17,310.00	89.67	356.81	11,889.48	4,839.30 N	1,014.14 W	509,353.70	725,507.16	1.75	4,917.12	98.47	
17,312.00	89.67	356.84	11,889.49	4,841.30 N	1,014.25 W	509,355.70	725,507.05	1.75	4,919.12	98.47	
17,314.00	89.66	356.88	11,889.50	4,843.30 N	1,014.36 W	509,357.70	725,506.94	1.75	4,921.12	98.47	
17,316.00	89.66	356.91	11,889.51	4,845.29 N	1,014.46 W	509,359.69	725,506.84	1.75	4,923.11	98.47	
17,318.00	89.65	356.95	11,889.52	4,847.29 N	1,014.57 W	509,361.69	725,506.73	1.75	4,925.11	98.47	
17,320.00	89.65	356.98	11,889.53	4,849.29 N	1,014.68 W	509,363.69	725,506.62	1.75	4,927.11	98.47	
17,322.00	89.64	357.02	11,889.55	4,851.28 N	1,014.78 W	509,365.68	725,506.52	1.75	4,929.11	98.47	
17,324.00	89.64	357.05	11,889.56	4,853.28 N	1,014.89 W	509,367.68	725,506.41	1.75	4,931.10	98.47	
17,326.00	89.63	357.08	11,889.57	4,855.28 N	1,014.99 W	509,369.68	725,506.31	1.75	4,933.10	98.47	
17,328.00	89.63	357.12	11,889.59	4,857.28 N	1,015.09 W	509,371.68	725,506.21	1.75	4,935.10	98.47	
17,330.00	89.62	357.15	11,889.60	4,859.27 N	1,015.19 W	509,373.67	725,506.11	1.75	4,937.10	98.47	
17,332.00	89.62	357.19	11,889.61	4,861.27 N	1,015.29 W	509,375.67	725,506.01	1.75	4,939.09	98.47	
17,334.00	89.61	357.22	11,889.63	4,863.27 N	1,015.38 W	509,377.67	725,505.92	1.75	4,941.09	98.47	
17,336.00	89.61	357.26	11,889.64	4,865.27 N	1,015.48 W	509,379.67	725,505.82	1.75	4,943.09	98.47	
17,338.00	89.60	357.29	11,889.65	4,867.26 N	1,015.58 W	509,381.66	725,505.72	1.75	4,945.09	98.47	
17,340.00	89.60	357.33	11,889.67	4,869.26 N	1,015.67 W	509,383.66	725,505.63	1.75	4,947.08	98.47	
17,342.00	89.59	357.36	11,889.68	4,871.26 N	1,015.76 W	509,385.66	725,505.54	1.75	4,949.08	98.46	
17,344.00	89.59	357.40	11,889.70	4,873.26 N	1,015.85 W	509,387.66	725,505.45	1.75	4,951.08	98.46	
17,346.00	89.58	357.43	11,889.71	4,875.25 N	1,015.94 W	509,389.65	725,505.36	1.75	4,953.07	98.46	
17,348.00	89.58	357.47	11,889.72	4,877.25 N	1,016.03 W	509,391.65	725,505.27	1.75	4,955.07	98.46	
17,350.00	89.57	357.50	11,889.74	4,879.25 N	1,016.12 W	509,393.65	725,505.18	1.75	4,957.07	98.46	
17,352.00	89.58	357.56	11,889.75	4,881.25 N	1,016.21 W	509,395.65	725,505.09	3.17	4,959.06	77.72	
17,354.00	89.60	357.62	11,889.77	4,883.25 N	1,016.29 W	509,397.65	725,505.01	3.17	4,961.06	77.72	
17,356.00	89.61	357.69	11,889.78	4,885.25 N	1,016.37 W	509,399.65	725,504.93	3.17	4,963.06	77.72	
17,358.00	89.62	357.75	11,889.80	4,887.24 N	1,016.45 W	509,401.64	725,504.85	3.17	4,965.05	77.72	
17,360.00	89.64	357.81	11,889.81	4,889.24 N	1,016.53 W	509,403.64	725,504.77	3.17	4,967.05	77.72	
17,362.00	89.65	357.87	11,889.82	4,891.24 N	1,016.61 W	509,405.64	725,504.69	3.17	4,969.04	77.72	
17,364.00	89.66	357.93	11,889.83	4,893.24 N	1,016.68 W	509,407.64	725,504.62	3.17	4,971.04	77.72	
17,366.00	89.68	358.00	11,889.84	4,895.24 N	1,016.75 W	509,409.64	725,504.55	3.17	4,973.03	77.72	
17,368.00	89.69	358.06	11,889.86	4,897.24 N	1,016.82 W	509,411.64	725,504.48	3.17	4,975.03	77.72	
17,370.00	89.70	358.12	11,889.87	4,899.24 N	1,016.89 W	509,413.64	725,504.41	3.17	4,977.03	77.72	



Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
17,372.00	89.72	358.18	11,889.88	4,901.23 N	1,016.95 W	509,415.63	725,504.35	3.17	4,979.02	77.72	
17,374.00	89.73	358.24	11,889.89	4,903.23 N	1,017.01 W	509,417.63	725,504.29	3.17	4,981.02	77.72	
17,376.00	89.75	358.30	11,889.90	4,905.23 N	1,017.07 W	509,419.63	725,504.23	3.17	4,983.01	77.72	
17,378.00	89.76	358.37	11,889.90	4,907.23 N	1,017.13 W	509,421.63	725,504.17	3.17	4,985.01	77.72	
17,380.00	89.77	358.43	11,889.91	4,909.23 N	1,017.19 W	509,423.63	725,504.11	3.17	4,987.00	77.72	
17,382.00	89.79	358.49	11,889.92	4,911.23 N	1,017.24 W	509,425.63	725,504.06	3.17	4,988.99	77.72	
17,384.00	89.80	358.55	11,889.93	4,913.23 N	1,017.29 W	509,427.63	725,504.01	3.17	4,990.99	77.72	
17,386.00	89.81	358.61	11,889.93	4,915.23 N	1,017.34 W	509,429.63	725,503.96	3.17	4,992.98	77.72	
17,388.00	89.83	358.68	11,889.94	4,917.23 N	1,017.39 W	509,431.63	725,503.91	3.17	4,994.98	77.72	
17,390.00	89.84	358.74	11,889.95	4,919.23 N	1,017.43 W	509,433.63	725,503.87	3.17	4,996.97	77.72	
17,392.00	89.85	358.80	11,889.95	4,921.23 N	1,017.48 W	509,435.63	725,503.82	3.17	4,998.96	77.72	
17,394.00	89.87	358.86	11,889.96	4,923.23 N	1,017.52 W	509,437.63	725,503.78	3.17	5,000.96	77.72	
17,396.00	89.88	358.92	11,889.96	4,925.23 N	1,017.56 W	509,439.63	725,503.74	3.17	5,002.95	77.72	
17,398.00	89.89	358.99	11,889.96	4,927.23 N	1,017.59 W	509,441.63	725,503.71	3.17	5,004.94	77.72	
17,400.00	89.91	359.05	11,889.97	4,929.23 N	1,017.63 W	509,443.63	725,503.67	3.17	5,006.94	77.72	
17,402.00	89.92	359.11	11,889.97	4,931.23 N	1,017.66 W	509,445.63	725,503.64	3.17	5,008.93	77.72	
17,404.00	89.93	359.17	11,889.97	4,933.23 N	1,017.69 W	509,447.63	725,503.61	3.17	5,010.92	77.72	
17,406.00	89.95	359.23	11,889.98	4,935.23 N	1,017.72 W	509,449.63	725,503.58	3.17	5,012.91	77.72	
17,408.00	89.96	359.29	11,889.98	4,937.23 N	1,017.74 W	509,451.63	725,503.56	3.17	5,014.91	77.72	
17,410.00	89.97	359.36	11,889.98	4,939.22 N	1,017.77 W	509,453.62	725,503.53	3.17	5,016.90	77.72	
17,412.00	89.99	359.42	11,889.98	4,941.22 N	1,017.79 W	509,455.62	725,503.51	3.17	5,018.89	77.72	
17,414.00	90.00	359.48	11,889.98	4,943.22 N	1,017.81 W	509,457.62	725,503.49	3.17	5,020.88	77.72	
17,416.00	90.01	359.54	11,889.98	4,945.22 N	1,017.82 W	509,459.62	725,503.48	3.17	5,022.87	77.72	
17,418.00	90.03	359.60	11,889.98	4,947.22 N	1,017.84 W	509,461.62	725,503.46	3.17	5,024.86	77.72	
17,420.00	90.04	359.67	11,889.98	4,949.22 N	1,017.85 W	509,463.62	725,503.45	3.17	5,026.86	77.72	
17,422.00	90.06	359.73	11,889.98	4,951.22 N	1,017.86 W	509,465.62	725,503.44	3.17	5,028.85	77.72	
17,424.00	90.07	359.79	11,889.97	4,953.22 N	1,017.87 W	509,467.62	725,503.43	3.17	5,030.84	77.72	
17,426.00	90.08	359.85	11,889.97	4,955.22 N	1,017.88 W	509,469.62	725,503.42	3.17	5,032.83	77.72	
17,428.00	90.10	359.91	11,889.97	4,957.22 N	1,017.88 W	509,471.62	725,503.42	3.17	5,034.82	77.72	
17,430.00	90.11	359.98	11,889.96	4,959.22 N	1,017.88 W	509,473.62	725,503.42	3.17	5,036.81	77.72	
17,432.00	90.12	0.04	11,889.96	4,961.22 N	1,017.88 W	509,475.62	725,503.42	3.17	5,038.80	77.72	
17,434.00	90.14	0.10	11,889.96	4,963.22 N	1,017.88 W	509,477.62	725,503.42	3.17	5,040.79	77.72	
17,436.00	90.15	0.16	11,889.95	4,965.22 N	1,017.88 W	509,479.62	725,503.42	3.17	5,042.78	77.72	
17,438.00	90.16	0.22	11,889.94	4,967.22 N	1,017.87 W	509,481.62	725,503.43	3.17	5,044.76	77.72	
17,440.00	90.18	0.29	11,889.94	4,969.22 N	1,017.86 W	509,483.62	725,503.44	3.17	5,046.75	77.72	
17,442.00	90.19	0.35	11,889.93	4,971.22 N	1,017.85 W	509,485.62	725,503.45	3.17	5,048.74	77.72	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
17,444.00	90.20	0.41	11,889.93	4,973.22 N	1,017.84 W	509,487.62	725,503.46	3.17	5,050.73	77.72	
17,446.00	90.21	0.43	11,889.92	4,975.22 N	1,017.82 W	509,489.62	725,503.48	1.05	5,052.72	84.48	
17,448.00	90.20	0.41	11,889.91	4,977.22 N	1,017.81 W	509,491.62	725,503.49	1.10	5,054.71	-115.33	
17,450.00	90.19	0.39	11,889.90	4,979.22 N	1,017.79 W	509,493.62	725,503.51	1.10	5,056.69	-115.34	
17,452.00	90.18	0.37	11,889.90	4,981.22 N	1,017.78 W	509,495.62	725,503.52	1.10	5,058.68	-115.34	
17,454.00	90.17	0.35	11,889.89	4,983.22 N	1,017.77 W	509,497.62	725,503.53	1.10	5,060.67	-115.34	
17,456.00	90.16	0.33	11,889.89	4,985.22 N	1,017.76 W	509,499.62	725,503.54	1.10	5,062.66	-115.34	
17,458.00	90.15	0.31	11,889.88	4,987.22 N	1,017.74 W	509,501.62	725,503.56	1.10	5,064.65	-115.34	
17,460.00	90.14	0.29	11,889.88	4,989.22 N	1,017.73 W	509,503.62	725,503.57	1.10	5,066.64	-115.34	
17,462.00	90.13	0.27	11,889.87	4,991.22 N	1,017.72 W	509,505.62	725,503.58	1.10	5,068.63	-115.34	
17,464.00	90.12	0.25	11,889.87	4,993.22 N	1,017.71 W	509,507.62	725,503.59	1.10	5,070.61	-115.34	
17,466.00	90.11	0.23	11,889.86	4,995.22 N	1,017.71 W	509,509.62	725,503.59	1.10	5,072.60	-115.34	
17,468.00	90.10	0.21	11,889.86	4,997.22 N	1,017.70 W	509,511.62	725,503.60	1.10	5,074.59	-115.34	
17,470.00	90.09	0.19	11,889.86	4,999.22 N	1,017.69 W	509,513.62	725,503.61	1.10	5,076.58	-115.34	
17,472.00	90.08	0.17	11,889.85	5,001.22 N	1,017.68 W	509,515.62	725,503.62	1.10	5,078.57	-115.34	
17,474.00	90.07	0.15	11,889.85	5,003.22 N	1,017.68 W	509,517.62	725,503.62	1.10	5,080.56	-115.34	
17,476.00	90.06	0.13	11,889.85	5,005.22 N	1,017.67 W	509,519.62	725,503.63	1.10	5,082.55	-115.34	
17,478.00	90.05	0.11	11,889.85	5,007.22 N	1,017.67 W	509,521.62	725,503.63	1.10	5,084.54	-115.34	
17,480.00	90.05	0.09	11,889.84	5,009.22 N	1,017.67 W	509,523.62	725,503.63	1.10	5,086.53	-115.34	
17,482.00	90.04	0.07	11,889.84	5,011.22 N	1,017.66 W	509,525.62	725,503.64	1.10	5,088.52	-115.34	
17,484.00	90.03	0.05	11,889.84	5,013.22 N	1,017.66 W	509,527.62	725,503.64	1.10	5,090.51	-115.34	
17,486.00	90.02	0.03	11,889.84	5,015.22 N	1,017.66 W	509,529.62	725,503.64	1.10	5,092.50	-115.34	
17,488.00	90.01	0.01	11,889.84	5,017.22 N	1,017.66 W	509,531.62	725,503.64	1.10	5,094.49	-115.34	
17,490.00	90.00	359.99	11,889.84	5,019.22 N	1,017.66 W	509,533.62	725,503.64	1.10	5,096.48	-115.34	
17,492.00	89.99	359.97	11,889.84	5,021.22 N	1,017.66 W	509,535.62	725,503.64	1.10	5,098.46	-115.34	
17,494.00	89.98	359.95	11,889.84	5,023.22 N	1,017.66 W	509,537.62	725,503.64	1.10	5,100.45	-115.34	
17,496.00	89.97	359.93	11,889.84	5,025.22 N	1,017.66 W	509,539.62	725,503.64	1.10	5,102.44	-115.34	
17,498.00	89.96	359.91	11,889.84	5,027.22 N	1,017.67 W	509,541.62	725,503.63	1.10	5,104.43	-115.34	
17,500.00	89.95	359.89	11,889.84	5,029.22 N	1,017.67 W	509,543.62	725,503.63	1.10	5,106.42	-115.34	
17,502.00	89.94	359.87	11,889.85	5,031.22 N	1,017.67 W	509,545.62	725,503.63	1.10	5,108.41	-115.34	
17,504.00	89.93	359.85	11,889.85	5,033.22 N	1,017.68 W	509,547.62	725,503.62	1.10	5,110.41	-115.34	
17,506.00	89.92	359.83	11,889.85	5,035.22 N	1,017.68 W	509,549.62	725,503.62	1.10	5,112.40	-115.34	
17,508.00	89.91	359.81	11,889.85	5,037.22 N	1,017.69 W	509,551.62	725,503.61	1.10	5,114.39	-115.34	
17,510.00	89.90	359.79	11,889.86	5,039.22 N	1,017.70 W	509,553.62	725,503.60	1.10	5,116.38	-115.34	
17,512.00	89.89	359.77	11,889.86	5,041.22 N	1,017.70 W	509,555.62	725,503.60	1.10	5,118.37	-115.34	
17,514.00	89.89	359.75	11,889.86	5,043.22 N	1,017.71 W	509,557.62	725,503.59	1.10	5,120.36	-115.34	
17,516.00	89.88	359.73	11,889.87	5,045.22 N	1,017.72 W	509,559.62	725,503.58	1.10	5,122.35	-115.34	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
17,518.00	89.87	359.71	11,889.87	5,047.22 N	1,017.73 W	509,561.62	725,503.57	1.10	5,124.34	-115.34	
17,520.00	89.86	359.69	11,889.88	5,049.22 N	1,017.74 W	509,563.62	725,503.56	1.10	5,126.33	-115.34	
17,522.00	89.85	359.67	11,889.88	5,051.22 N	1,017.75 W	509,565.62	725,503.55	1.10	5,128.32	-115.34	
17,524.00	89.84	359.65	11,889.89	5,053.22 N	1,017.76 W	509,567.62	725,503.54	1.10	5,130.31	-115.34	
17,526.00	89.83	359.63	11,889.89	5,055.22 N	1,017.78 W	509,569.62	725,503.52	1.10	5,132.30	-115.34	
17,528.00	89.82	359.61	11,889.90	5,057.22 N	1,017.79 W	509,571.62	725,503.51	1.10	5,134.29	-115.34	
17,530.00	89.81	359.59	11,889.91	5,059.22 N	1,017.80 W	509,573.62	725,503.50	1.10	5,136.28	-115.34	
17,532.00	89.80	359.57	11,889.91	5,061.22 N	1,017.82 W	509,575.62	725,503.48	1.10	5,138.27	-115.34	
17,534.00	89.79	359.55	11,889.92	5,063.22 N	1,017.83 W	509,577.62	725,503.47	1.10	5,140.27	-115.33	
17,536.00	89.78	359.53	11,889.93	5,065.22 N	1,017.85 W	509,579.62	725,503.45	1.10	5,142.26	-115.33	
17,538.00	89.77	359.51	11,889.94	5,067.22 N	1,017.87 W	509,581.62	725,503.43	1.10	5,144.25	-115.33	
17,540.00	89.76	359.50	11,889.94	5,069.22 N	1,017.88 W	509,583.62	725,503.42	1.10	5,146.24	-115.33	
17,542.00	89.75	359.48	11,889.95	5,071.22 N	1,017.90 W	509,585.62	725,503.40	1.10	5,148.23	-115.33	
17,544.00	89.74	359.46	11,889.96	5,073.22 N	1,017.92 W	509,587.62	725,503.38	1.10	5,150.22	-115.33	
17,546.00	89.73	359.44	11,889.97	5,075.22 N	1,017.94 W	509,589.62	725,503.36	1.10	5,152.21	-115.33	
17,548.00	89.72	359.42	11,889.98	5,077.22 N	1,017.96 W	509,591.62	725,503.34	1.10	5,154.21	-115.33	
17,550.00	89.72	359.40	11,889.99	5,079.22 N	1,017.98 W	509,593.62	725,503.32	1.10	5,156.20	-115.33	
17,552.00	89.71	359.38	11,890.00	5,081.22 N	1,018.00 W	509,595.62	725,503.30	1.10	5,158.19	-115.33	
17,554.00	89.70	359.36	11,890.01	5,083.22 N	1,018.02 W	509,597.62	725,503.28	1.10	5,160.18	-115.33	
17,556.00	89.69	359.34	11,890.02	5,085.22 N	1,018.05 W	509,599.62	725,503.25	1.10	5,162.17	-115.33	
17,558.00	89.68	359.32	11,890.03	5,087.22 N	1,018.07 W	509,601.62	725,503.23	1.10	5,164.17	-115.33	
17,560.00	89.67	359.30	11,890.04	5,089.22 N	1,018.09 W	509,603.62	725,503.21	1.10	5,166.16	-115.33	
17,562.00	89.66	359.28	11,890.06	5,091.22 N	1,018.12 W	509,605.62	725,503.18	1.10	5,168.15	-115.33	
17,564.00	89.65	359.26	11,890.07	5,093.22 N	1,018.14 W	509,607.62	725,503.16	1.10	5,170.14	-115.33	
17,566.00	89.64	359.24	11,890.08	5,095.22 N	1,018.17 W	509,609.62	725,503.13	1.10	5,172.13	-115.33	
17,568.00	89.63	359.22	11,890.09	5,097.22 N	1,018.20 W	509,611.62	725,503.10	1.10	5,174.13	-115.33	
17,570.00	89.62	359.20	11,890.11	5,099.22 N	1,018.23 W	509,613.62	725,503.07	1.10	5,176.12	-115.33	
17,572.00	89.61	359.18	11,890.12	5,101.22 N	1,018.25 W	509,615.62	725,503.05	1.10	5,178.11	-115.33	
17,574.00	89.60	359.16	11,890.13	5,103.22 N	1,018.28 W	509,617.62	725,503.02	1.10	5,180.10	-115.33	
17,576.00	89.59	359.14	11,890.15	5,105.22 N	1,018.31 W	509,619.62	725,502.99	1.10	5,182.10	-115.33	
17,578.00	89.58	359.12	11,890.16	5,107.22 N	1,018.34 W	509,621.62	725,502.96	1.10	5,184.09	-115.33	
17,580.00	89.57	359.10	11,890.18	5,109.22 N	1,018.37 W	509,623.62	725,502.93	1.10	5,186.08	-115.33	
17,582.00	89.56	359.08	11,890.19	5,111.22 N	1,018.41 W	509,625.62	725,502.89	1.10	5,188.07	-115.33	
17,584.00	89.56	359.06	11,890.21	5,113.22 N	1,018.44 W	509,627.62	725,502.86	1.10	5,190.07	-115.33	
17,586.00	89.55	359.04	11,890.22	5,115.22 N	1,018.47 W	509,629.62	725,502.83	1.10	5,192.06	-115.33	
17,588.00	89.54	359.02	11,890.24	5,117.22 N	1,018.51 W	509,631.62	725,502.79	1.10	5,194.05	-115.33	
17,590.00	89.53	359.00	11,890.25	5,119.22 N	1,018.54 W	509,633.62	725,502.76	1.10	5,196.04	-115.33	

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Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
17,592.00	89.52	358.98	11,890.27	5,121.22 N	1,018.58 W	509,635.62	725,502.72	1.10	5,198.04	-115.33	
17,594.00	89.51	358.96	11,890.29	5,123.22 N	1,018.61 W	509,637.62	725,502.69	1.10	5,200.03	-115.33	
17,596.00	89.50	358.94	11,890.31	5,125.22 N	1,018.65 W	509,639.62	725,502.65	1.10	5,202.02	-115.33	
17,598.00	89.49	358.92	11,890.32	5,127.22 N	1,018.69 W	509,641.62	725,502.61	1.10	5,204.02	-115.33	
17,600.00	89.48	358.90	11,890.34	5,129.22 N	1,018.72 W	509,643.62	725,502.58	1.10	5,206.01	-115.33	
17,602.00	89.47	358.88	11,890.36	5,131.21 N	1,018.76 W	509,645.61	725,502.54	1.10	5,208.00	-115.33	
17,604.00	89.46	358.86	11,890.38	5,133.21 N	1,018.80 W	509,647.61	725,502.50	1.10	5,210.00	-115.33	
17,606.00	89.45	358.84	11,890.40	5,135.21 N	1,018.84 W	509,649.61	725,502.46	1.10	5,211.99	-115.33	
17,608.00	89.44	358.82	11,890.42	5,137.21 N	1,018.88 W	509,651.61	725,502.42	1.10	5,213.98	-115.33	
17,610.00	89.43	358.80	11,890.44	5,139.21 N	1,018.93 W	509,653.61	725,502.37	1.10	5,215.98	-115.33	
17,612.00	89.42	358.78	11,890.46	5,141.21 N	1,018.97 W	509,655.61	725,502.33	1.10	5,217.97	-115.33	
17,614.00	89.41	358.76	11,890.48	5,143.21 N	1,019.01 W	509,657.61	725,502.29	1.10	5,219.96	-115.33	
17,616.00	89.40	358.74	11,890.50	5,145.21 N	1,019.05 W	509,659.61	725,502.25	1.10	5,221.96	-115.33	
17,618.00	89.40	358.72	11,890.52	5,147.21 N	1,019.10 W	509,661.61	725,502.20	1.10	5,223.95	-115.33	
17,620.00	89.39	358.70	11,890.54	5,149.21 N	1,019.14 W	509,663.61	725,502.16	1.10	5,225.94	-115.33	
17,622.00	89.38	358.68	11,890.56	5,151.21 N	1,019.19 W	509,665.61	725,502.11	1.10	5,227.94	-115.33	
17,624.00	89.37	358.66	11,890.58	5,153.21 N	1,019.24 W	509,667.61	725,502.06	1.10	5,229.93	-115.33	
17,626.00	89.36	358.64	11,890.60	5,155.21 N	1,019.28 W	509,669.61	725,502.02	1.10	5,231.92	-115.33	
17,628.00	89.35	358.62	11,890.63	5,157.21 N	1,019.33 W	509,671.61	725,501.97	1.10	5,233.92	-115.33	
17,630.00	89.34	358.60	11,890.65	5,159.21 N	1,019.38 W	509,673.61	725,501.92	1.10	5,235.91	-115.33	
17,632.00	89.33	358.58	11,890.67	5,161.21 N	1,019.43 W	509,675.61	725,501.87	1.10	5,237.91	-115.33	
17,634.00	89.32	358.56	11,890.70	5,163.21 N	1,019.48 W	509,677.61	725,501.82	1.10	5,239.90	-115.33	
17,636.00	89.35	358.58	11,890.72	5,165.20 N	1,019.53 W	509,679.60	725,501.77	1.87	5,241.89	25.98	
17,638.00	89.39	358.59	11,890.74	5,167.20 N	1,019.58 W	509,681.60	725,501.72	1.87	5,243.89	25.98	
17,640.00	89.42	358.61	11,890.76	5,169.20 N	1,019.63 W	509,683.60	725,501.67	1.87	5,245.88	25.98	
17,642.00	89.45	358.63	11,890.78	5,171.20 N	1,019.67 W	509,685.60	725,501.63	1.87	5,247.88	25.98	
17,644.00	89.49	358.64	11,890.80	5,173.20 N	1,019.72 W	509,687.60	725,501.58	1.87	5,249.87	25.98	
17,646.00	89.52	358.66	11,890.82	5,175.20 N	1,019.77 W	509,689.60	725,501.53	1.87	5,251.86	25.98	
17,648.00	89.56	358.67	11,890.83	5,177.20 N	1,019.82 W	509,691.60	725,501.48	1.87	5,253.86	25.98	
17,650.00	89.59	358.69	11,890.85	5,179.20 N	1,019.86 W	509,693.60	725,501.44	1.87	5,255.85	25.98	
17,652.00	89.62	358.71	11,890.86	5,181.20 N	1,019.91 W	509,695.60	725,501.39	1.87	5,257.85	25.98	
17,654.00	89.66	358.72	11,890.88	5,183.20 N	1,019.95 W	509,697.60	725,501.35	1.87	5,259.84	25.98	
17,656.00	89.69	358.74	11,890.89	5,185.20 N	1,020.00 W	509,699.60	725,501.30	1.87	5,261.83	25.98	
17,658.00	89.72	358.76	11,890.90	5,187.20 N	1,020.04 W	509,701.60	725,501.26	1.87	5,263.83	25.98	
17,660.00	89.76	358.77	11,890.91	5,189.20 N	1,020.08 W	509,703.60	725,501.22	1.87	5,265.82	25.98	
17,662.00	89.79	358.79	11,890.91	5,191.20 N	1,020.13 W	509,705.60	725,501.17	1.87	5,267.81	25.98	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
17,664.00	89.82	358.81	11,890.92	5,193.20 N	1,020.17 W	509,707.60	725,501.13	1.87	5,269.81	25.98	
17,666.00	89.86	358.82	11,890.93	5,195.20 N	1,020.21 W	509,709.60	725,501.09	1.87	5,271.80	25.98	
17,668.00	89.89	358.84	11,890.93	5,197.20 N	1,020.25 W	509,711.60	725,501.05	1.87	5,273.79	25.98	
17,670.00	89.93	358.85	11,890.93	5,199.19 N	1,020.29 W	509,713.59	725,501.01	1.87	5,275.79	25.98	
17,672.00	89.96	358.87	11,890.94	5,201.19 N	1,020.33 W	509,715.59	725,500.97	1.87	5,277.78	25.98	
17,674.00	89.99	358.89	11,890.94	5,203.19 N	1,020.37 W	509,717.59	725,500.93	1.87	5,279.77	25.98	
17,676.00	90.03	358.90	11,890.94	5,205.19 N	1,020.41 W	509,719.59	725,500.89	1.87	5,281.77	25.98	
17,678.00	90.06	358.92	11,890.94	5,207.19 N	1,020.45 W	509,721.59	725,500.85	1.87	5,283.76	25.98	
17,680.00	90.09	358.94	11,890.93	5,209.19 N	1,020.48 W	509,723.59	725,500.82	1.87	5,285.75	25.98	
17,682.00	90.13	358.95	11,890.93	5,211.19 N	1,020.52 W	509,725.59	725,500.78	1.87	5,287.75	25.98	
17,684.00	90.16	358.97	11,890.92	5,213.19 N	1,020.56 W	509,727.59	725,500.74	1.87	5,289.74	25.98	
17,686.00	90.19	358.99	11,890.92	5,215.19 N	1,020.59 W	509,729.59	725,500.71	1.87	5,291.73	25.98	
17,688.00	90.23	359.00	11,890.91	5,217.19 N	1,020.63 W	509,731.59	725,500.67	1.87	5,293.73	25.98	
17,690.00	90.26	359.02	11,890.90	5,219.19 N	1,020.66 W	509,733.59	725,500.64	1.87	5,295.72	25.98	
17,692.00	90.29	359.04	11,890.89	5,221.19 N	1,020.70 W	509,735.59	725,500.60	1.87	5,297.71	25.98	
17,694.00	90.33	359.05	11,890.88	5,223.19 N	1,020.73 W	509,737.59	725,500.57	1.87	5,299.70	25.98	
17,696.00	90.36	359.07	11,890.87	5,225.19 N	1,020.76 W	509,739.59	725,500.54	1.87	5,301.70	25.98	
17,698.00	90.40	359.08	11,890.86	5,227.19 N	1,020.79 W	509,741.59	725,500.51	1.87	5,303.69	25.98	
17,700.00	90.43	359.10	11,890.84	5,229.19 N	1,020.83 W	509,743.59	725,500.47	1.87	5,305.68	25.98	
17,702.00	90.46	359.12	11,890.83	5,231.19 N	1,020.86 W	509,745.59	725,500.44	1.87	5,307.68	25.98	
17,704.00	90.50	359.13	11,890.81	5,233.19 N	1,020.89 W	509,747.59	725,500.41	1.87	5,309.67	25.98	
17,706.00	90.53	359.15	11,890.79	5,235.19 N	1,020.92 W	509,749.59	725,500.38	1.87	5,311.66	25.98	
17,708.00	90.56	359.17	11,890.77	5,237.19 N	1,020.95 W	509,751.59	725,500.35	1.87	5,313.65	25.98	
17,710.00	90.60	359.18	11,890.75	5,239.19 N	1,020.98 W	509,753.59	725,500.32	1.87	5,315.64	25.98	
17,712.00	90.63	359.20	11,890.73	5,241.19 N	1,021.00 W	509,755.59	725,500.30	1.87	5,317.64	25.98	
17,714.00	90.66	359.22	11,890.71	5,243.19 N	1,021.03 W	509,757.59	725,500.27	1.87	5,319.63	25.98	
17,716.00	90.70	359.23	11,890.68	5,245.19 N	1,021.06 W	509,759.59	725,500.24	1.87	5,321.62	25.98	
17,718.00	90.73	359.25	11,890.66	5,247.19 N	1,021.08 W	509,761.59	725,500.22	1.87	5,323.61	25.98	
17,720.00	90.77	359.26	11,890.63	5,249.19 N	1,021.11 W	509,763.59	725,500.19	1.87	5,325.61	25.98	
17,722.00	90.80	359.28	11,890.61	5,251.19 N	1,021.14 W	509,765.59	725,500.16	1.87	5,327.60	25.98	
17,724.00	90.83	359.30	11,890.58	5,253.19 N	1,021.16 W	509,767.59	725,500.14	1.87	5,329.59	25.98	
17,726.00	90.87	359.31	11,890.55	5,255.19 N	1,021.19 W	509,769.59	725,500.11	1.87	5,331.58	25.98	
17,728.00	90.90	359.33	11,890.52	5,257.19 N	1,021.21 W	509,771.59	725,500.09	1.87	5,333.57	25.98	
17,730.00	90.88	359.37	11,890.49	5,259.18 N	1,021.23 W	509,773.58	725,500.07	2.06	5,335.56	117.08	
17,732.00	90.86	359.40	11,890.46	5,261.18 N	1,021.25 W	509,775.58	725,500.05	2.06	5,337.56	117.08	
17,734.00	90.84	359.44	11,890.43	5,263.18 N	1,021.27 W	509,777.58	725,500.03	2.06	5,339.55	117.08	
17,736.00	90.83	359.48	11,890.40	5,265.18 N	1,021.29 W	509,779.58	725,500.01	2.06	5,341.54	117.08	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
17,738.00	90.81	359.51	11,890.37	5,267.18 N	1,021.31 W	509,781.58	725,499.99	2.06	5,343.53	117.08	
17,740.00	90.79	359.55	11,890.34	5,269.18 N	1,021.33 W	509,783.58	725,499.97	2.06	5,345.52	117.08	
17,742.00	90.77	359.59	11,890.31	5,271.18 N	1,021.34 W	509,785.58	725,499.96	2.06	5,347.51	117.08	
17,744.00	90.75	359.62	11,890.29	5,273.18 N	1,021.35 W	509,787.58	725,499.95	2.06	5,349.50	117.09	
17,746.00	90.73	359.66	11,890.26	5,275.18 N	1,021.37 W	509,789.58	725,499.93	2.06	5,351.49	117.09	
17,748.00	90.71	359.70	11,890.24	5,277.18 N	1,021.38 W	509,791.58	725,499.92	2.06	5,353.48	117.09	
17,750.00	90.69	359.73	11,890.21	5,279.18 N	1,021.39 W	509,793.58	725,499.91	2.06	5,355.48	117.09	
17,752.00	90.68	359.77	11,890.19	5,281.18 N	1,021.40 W	509,795.58	725,499.90	2.06	5,357.47	117.09	
17,754.00	90.66	359.81	11,890.16	5,283.18 N	1,021.40 W	509,797.58	725,499.90	2.06	5,359.46	117.09	
17,756.00	90.64	359.84	11,890.14	5,285.18 N	1,021.41 W	509,799.58	725,499.89	2.06	5,361.45	117.09	
17,758.00	90.62	359.88	11,890.12	5,287.18 N	1,021.42 W	509,801.58	725,499.88	2.06	5,363.44	117.09	
17,760.00	90.60	359.92	11,890.10	5,289.18 N	1,021.42 W	509,803.58	725,499.88	2.06	5,365.43	117.09	
17,762.00	90.58	359.95	11,890.08	5,291.18 N	1,021.42 W	509,805.58	725,499.88	2.06	5,367.42	117.09	
17,764.00	90.56	359.99	11,890.06	5,293.18 N	1,021.42 W	509,807.58	725,499.88	2.06	5,369.41	117.09	
17,766.00	90.54	0.03	11,890.04	5,295.18 N	1,021.42 W	509,809.58	725,499.88	2.06	5,371.40	117.09	
17,768.00	90.53	0.06	11,890.02	5,297.18 N	1,021.42 W	509,811.58	725,499.88	2.06	5,373.38	117.09	
17,770.00	90.51	0.10	11,890.00	5,299.18 N	1,021.42 W	509,813.58	725,499.88	2.06	5,375.37	117.09	
17,772.00	90.49	0.14	11,889.98	5,301.18 N	1,021.41 W	509,815.58	725,499.89	2.06	5,377.36	117.09	
17,774.00	90.47	0.17	11,889.97	5,303.18 N	1,021.41 W	509,817.58	725,499.89	2.06	5,379.35	117.09	
17,776.00	90.45	0.21	11,889.95	5,305.18 N	1,021.40 W	509,819.58	725,499.90	2.06	5,381.34	117.09	
17,778.00	90.43	0.25	11,889.94	5,307.18 N	1,021.39 W	509,821.58	725,499.91	2.06	5,383.33	117.09	
17,780.00	90.41	0.28	11,889.92	5,309.18 N	1,021.38 W	509,823.58	725,499.92	2.06	5,385.32	117.09	
17,782.00	90.39	0.32	11,889.91	5,311.18 N	1,021.37 W	509,825.58	725,499.93	2.06	5,387.31	117.09	
17,784.00	90.38	0.36	11,889.89	5,313.18 N	1,021.36 W	509,827.58	725,499.94	2.06	5,389.30	117.09	
17,786.00	90.36	0.39	11,889.88	5,315.18 N	1,021.35 W	509,829.58	725,499.95	2.06	5,391.28	117.09	
17,788.00	90.34	0.43	11,889.87	5,317.18 N	1,021.33 W	509,831.58	725,499.97	2.06	5,393.27	117.09	
17,790.00	90.32	0.47	11,889.86	5,319.18 N	1,021.32 W	509,833.58	725,499.98	2.06	5,395.26	117.09	
17,792.00	90.30	0.50	11,889.85	5,321.18 N	1,021.30 W	509,835.58	725,500.00	2.06	5,397.25	117.09	
17,794.00	90.28	0.54	11,889.84	5,323.18 N	1,021.28 W	509,837.58	725,500.02	2.06	5,399.24	117.09	
17,796.00	90.26	0.58	11,889.83	5,325.18 N	1,021.26 W	509,839.58	725,500.04	2.06	5,401.22	117.09	
17,798.00	90.24	0.61	11,889.82	5,327.18 N	1,021.24 W	509,841.58	725,500.06	2.06	5,403.21	117.09	
17,800.00	90.23	0.65	11,889.81	5,329.18 N	1,021.22 W	509,843.58	725,500.08	2.06	5,405.20	117.09	
17,802.00	90.21	0.69	11,889.80	5,331.18 N	1,021.20 W	509,845.58	725,500.10	2.06	5,407.19	117.09	
17,804.00	90.19	0.72	11,889.80	5,333.18 N	1,021.17 W	509,847.58	725,500.13	2.06	5,409.17	117.09	
17,806.00	90.17	0.76	11,889.79	5,335.18 N	1,021.15 W	509,849.58	725,500.15	2.06	5,411.16	117.09	
17,808.00	90.15	0.80	11,889.78	5,337.18 N	1,021.12 W	509,851.58	725,500.18	2.06	5,413.15	117.09	
17,810.00	90.13	0.83	11,889.78	5,339.18 N	1,021.09 W	509,853.58	725,500.21	2.06	5,415.13	117.09	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
17,812.00	90.11	0.87	11,889.77	5,341.18 N	1,021.06 W	509,855.58	725,500.24	2.06	5,417.12	117.09	
17,814.00	90.09	0.91	11,889.77	5,343.18 N	1,021.03 W	509,857.58	725,500.27	2.06	5,419.11	117.09	
17,816.00	90.08	0.94	11,889.77	5,345.18 N	1,021.00 W	509,859.58	725,500.30	2.06	5,421.09	117.09	
17,818.00	90.06	0.98	11,889.77	5,347.18 N	1,020.97 W	509,861.58	725,500.33	2.06	5,423.08	117.10	
17,820.00	90.04	1.02	11,889.76	5,349.18 N	1,020.93 W	509,863.58	725,500.37	2.06	5,425.06	117.10	
17,822.00	90.02	1.05	11,889.76	5,351.18 N	1,020.90 W	509,865.58	725,500.40	2.06	5,427.05	117.10	
17,824.00	90.01	1.06	11,889.76	5,353.18 N	1,020.86 W	509,867.58	725,500.44	0.88	5,429.04	134.74	
17,826.00	90.00	1.05	11,889.76	5,355.18 N	1,020.82 W	509,869.58	725,500.48	0.65	5,431.02	-118.24	
17,828.00	89.99	1.04	11,889.76	5,357.18 N	1,020.79 W	509,871.58	725,500.51	0.65	5,433.01	-118.24	
17,830.00	89.99	1.03	11,889.76	5,359.18 N	1,020.75 W	509,873.58	725,500.55	0.65	5,434.99	-118.24	
17,832.00	89.98	1.02	11,889.76	5,361.18 N	1,020.71 W	509,875.58	725,500.59	0.65	5,436.98	-118.24	
17,834.00	89.98	1.01	11,889.76	5,363.18 N	1,020.68 W	509,877.58	725,500.62	0.65	5,438.96	-118.24	
17,836.00	89.97	1.00	11,889.76	5,365.18 N	1,020.64 W	509,879.58	725,500.66	0.65	5,440.95	-118.24	
17,838.00	89.96	0.98	11,889.77	5,367.17 N	1,020.61 W	509,881.57	725,500.69	0.65	5,442.94	-118.24	
17,840.00	89.96	0.97	11,889.77	5,369.17 N	1,020.57 W	509,883.57	725,500.73	0.65	5,444.92	-118.24	
17,842.00	89.95	0.96	11,889.77	5,371.17 N	1,020.54 W	509,885.57	725,500.76	0.65	5,446.91	-118.24	
17,844.00	89.95	0.95	11,889.77	5,373.17 N	1,020.51 W	509,887.57	725,500.79	0.65	5,448.89	-118.24	
17,846.00	89.94	0.94	11,889.77	5,375.17 N	1,020.47 W	509,889.57	725,500.83	0.65	5,450.88	-118.24	
17,848.00	89.93	0.93	11,889.77	5,377.17 N	1,020.44 W	509,891.57	725,500.86	0.65	5,452.87	-118.24	
17,850.00	89.93	0.91	11,889.78	5,379.17 N	1,020.41 W	509,893.57	725,500.89	0.65	5,454.85	-118.24	
17,852.00	89.92	0.90	11,889.78	5,381.17 N	1,020.38 W	509,895.57	725,500.92	0.65	5,456.84	-118.24	
17,854.00	89.91	0.89	11,889.78	5,383.17 N	1,020.35 W	509,897.57	725,500.95	0.65	5,458.83	-118.24	
17,856.00	89.91	0.88	11,889.79	5,385.17 N	1,020.32 W	509,899.57	725,500.98	0.65	5,460.81	-118.24	
17,858.00	89.90	0.87	11,889.79	5,387.17 N	1,020.28 W	509,901.57	725,501.02	0.65	5,462.80	-118.24	
17,860.00	89.90	0.86	11,889.79	5,389.17 N	1,020.25 W	509,903.57	725,501.05	0.65	5,464.78	-118.24	
17,862.00	89.89	0.85	11,889.80	5,391.17 N	1,020.23 W	509,905.57	725,501.07	0.65	5,466.77	-118.24	
17,864.00	89.88	0.83	11,889.80	5,393.17 N	1,020.20 W	509,907.57	725,501.10	0.65	5,468.76	-118.24	
17,866.00	89.88	0.82	11,889.80	5,395.17 N	1,020.17 W	509,909.57	725,501.13	0.65	5,470.74	-118.24	
17,868.00	89.87	0.81	11,889.81	5,397.17 N	1,020.14 W	509,911.57	725,501.16	0.65	5,472.73	-118.24	
17,870.00	89.86	0.80	11,889.81	5,399.17 N	1,020.11 W	509,913.57	725,501.19	0.65	5,474.72	-118.24	
17,872.00	89.86	0.79	11,889.82	5,401.17 N	1,020.08 W	509,915.57	725,501.22	0.65	5,476.70	-118.24	
17,874.00	89.85	0.78	11,889.82	5,403.17 N	1,020.06 W	509,917.57	725,501.24	0.65	5,478.69	-118.24	
17,876.00	89.85	0.77	11,889.83	5,405.17 N	1,020.03 W	509,919.57	725,501.27	0.65	5,480.68	-118.24	
17,878.00	89.84	0.75	11,889.83	5,407.17 N	1,020.00 W	509,921.57	725,501.30	0.65	5,482.66	-118.24	
17,880.00	89.83	0.74	11,889.84	5,409.17 N	1,019.98 W	509,923.57	725,501.32	0.65	5,484.65	-118.24	
17,882.00	89.83	0.73	11,889.85	5,411.17 N	1,019.95 W	509,925.57	725,501.35	0.65	5,486.64	-118.24	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
17,884.00	89.82	0.72	11,889.85	5,413.17 N	1,019.92 W	509,927.57	725,501.38	0.65	5,488.63	-118.24	
17,886.00	89.82	0.71	11,889.86	5,415.17 N	1,019.90 W	509,929.57	725,501.40	0.65	5,490.61	-118.24	
17,888.00	89.81	0.70	11,889.86	5,417.17 N	1,019.88 W	509,931.57	725,501.42	0.65	5,492.60	-118.24	
17,890.00	89.80	0.69	11,889.87	5,419.17 N	1,019.85 W	509,933.57	725,501.45	0.65	5,494.59	-118.24	
17,892.00	89.80	0.67	11,889.88	5,421.17 N	1,019.83 W	509,935.57	725,501.47	0.65	5,496.57	-118.24	
17,894.00	89.79	0.66	11,889.89	5,423.17 N	1,019.80 W	509,937.57	725,501.50	0.65	5,498.56	-118.24	
17,896.00	89.78	0.65	11,889.89	5,425.17 N	1,019.78 W	509,939.57	725,501.52	0.65	5,500.55	-118.24	
17,898.00	89.78	0.64	11,889.90	5,427.17 N	1,019.76 W	509,941.57	725,501.54	0.65	5,502.54	-118.24	
17,900.00	89.77	0.63	11,889.91	5,429.17 N	1,019.74 W	509,943.57	725,501.56	0.65	5,504.52	-118.24	
17,902.00	89.77	0.62	11,889.92	5,431.17 N	1,019.71 W	509,945.57	725,501.59	0.65	5,506.51	-118.24	
17,904.00	89.76	0.60	11,889.92	5,433.17 N	1,019.69 W	509,947.57	725,501.61	0.65	5,508.50	-118.24	
17,906.00	89.75	0.59	11,889.93	5,435.17 N	1,019.67 W	509,949.57	725,501.63	0.65	5,510.49	-118.24	
17,908.00	89.75	0.58	11,889.94	5,437.17 N	1,019.65 W	509,951.57	725,501.65	0.65	5,512.47	-118.24	
17,910.00	89.74	0.57	11,889.95	5,439.17 N	1,019.63 W	509,953.57	725,501.67	0.65	5,514.46	-118.24	
17,912.00	89.74	0.56	11,889.96	5,441.17 N	1,019.61 W	509,955.57	725,501.69	0.65	5,516.45	-118.24	
17,914.00	89.73	0.55	11,889.97	5,443.17 N	1,019.59 W	509,957.57	725,501.71	0.65	5,518.44	-118.24	
17,916.00	89.72	0.54	11,889.98	5,445.17 N	1,019.57 W	509,959.57	725,501.73	0.65	5,520.42	-118.24	
17,918.00	89.72	0.53	11,889.99	5,447.17 N	1,019.56 W	509,961.57	725,501.74	0.33	5,522.41	-118.24	
17,920.00	89.72	0.54	11,890.00	5,449.17 N	1,019.54 W	509,963.57	725,501.76	0.36	5,524.40	81.16	
17,922.00	89.72	0.54	11,890.01	5,451.17 N	1,019.52 W	509,965.57	725,501.78	0.24	5,526.39	81.16	
17,924.00	89.72	0.55	11,890.02	5,453.17 N	1,019.50 W	509,967.57	725,501.80	0.24	5,528.37	81.16	
17,926.00	89.72	0.55	11,890.03	5,455.17 N	1,019.48 W	509,969.57	725,501.82	0.24	5,530.36	81.16	
17,928.00	89.72	0.56	11,890.04	5,457.17 N	1,019.46 W	509,971.57	725,501.84	0.24	5,532.35	81.16	
17,930.00	89.72	0.56	11,890.05	5,459.17 N	1,019.44 W	509,973.57	725,501.86	0.24	5,534.34	81.16	
17,932.00	89.73	0.57	11,890.06	5,461.17 N	1,019.42 W	509,975.57	725,501.88	0.24	5,536.32	81.16	
17,934.00	89.73	0.57	11,890.07	5,463.17 N	1,019.40 W	509,977.57	725,501.90	0.24	5,538.31	81.16	
17,936.00	89.73	0.58	11,890.08	5,465.17 N	1,019.38 W	509,979.57	725,501.92	0.24	5,540.30	81.16	
17,938.00	89.73	0.58	11,890.09	5,467.17 N	1,019.36 W	509,981.57	725,501.94	0.24	5,542.29	81.16	
17,940.00	89.73	0.58	11,890.09	5,469.17 N	1,019.34 W	509,983.57	725,501.96	0.24	5,544.27	81.16	
17,942.00	89.73	0.59	11,890.10	5,471.17 N	1,019.32 W	509,985.57	725,501.98	0.24	5,546.26	81.16	
17,944.00	89.73	0.59	11,890.11	5,473.17 N	1,019.30 W	509,987.57	725,502.00	0.24	5,548.25	81.16	
17,946.00	89.73	0.60	11,890.12	5,475.17 N	1,019.28 W	509,989.57	725,502.02	0.24	5,550.24	81.16	
17,948.00	89.73	0.60	11,890.13	5,477.17 N	1,019.26 W	509,991.57	725,502.04	0.24	5,552.22	81.16	
17,950.00	89.73	0.61	11,890.14	5,479.17 N	1,019.24 W	509,993.57	725,502.06	0.24	5,554.21	81.16	
17,952.00	89.73	0.61	11,890.15	5,481.17 N	1,019.22 W	509,995.57	725,502.08	0.24	5,556.20	81.16	
17,954.00	89.73	0.62	11,890.16	5,483.16 N	1,019.19 W	509,997.56	725,502.11	0.24	5,558.19	81.16	
17,956.00	89.73	0.62	11,890.17	5,485.16 N	1,019.17 W	509,999.56	725,502.13	0.24	5,560.17	81.16	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
17,958.00	89.74	0.63	11,890.18	5,487.16 N	1,019.15 W	510,001.56	725,502.15	0.24	5,562.16	81.16	
17,960.00	89.74	0.63	11,890.19	5,489.16 N	1,019.13 W	510,003.56	725,502.17	0.24	5,564.15	81.16	
17,962.00	89.74	0.64	11,890.20	5,491.16 N	1,019.11 W	510,005.56	725,502.19	0.24	5,566.14	81.16	
17,964.00	89.74	0.64	11,890.21	5,493.16 N	1,019.08 W	510,007.56	725,502.22	0.24	5,568.12	81.16	
17,966.00	89.74	0.65	11,890.22	5,495.16 N	1,019.06 W	510,009.56	725,502.24	0.24	5,570.11	81.16	
17,968.00	89.74	0.65	11,890.22	5,497.16 N	1,019.04 W	510,011.56	725,502.26	0.24	5,572.10	81.16	
17,970.00	89.74	0.66	11,890.23	5,499.16 N	1,019.02 W	510,013.56	725,502.28	0.24	5,574.09	81.16	
17,972.00	89.74	0.66	11,890.24	5,501.16 N	1,018.99 W	510,015.56	725,502.31	0.24	5,576.07	81.16	
17,974.00	89.74	0.67	11,890.25	5,503.16 N	1,018.97 W	510,017.56	725,502.33	0.24	5,578.06	81.16	
17,976.00	89.74	0.67	11,890.26	5,505.16 N	1,018.95 W	510,019.56	725,502.35	0.24	5,580.05	81.16	
17,978.00	89.74	0.68	11,890.27	5,507.16 N	1,018.92 W	510,021.56	725,502.38	0.24	5,582.03	81.16	
17,980.00	89.74	0.68	11,890.28	5,509.16 N	1,018.90 W	510,023.56	725,502.40	0.24	5,584.02	81.16	
17,982.00	89.74	0.68	11,890.29	5,511.16 N	1,018.88 W	510,025.56	725,502.42	0.24	5,586.01	81.16	
17,984.00	89.74	0.69	11,890.30	5,513.16 N	1,018.85 W	510,027.56	725,502.45	0.24	5,588.00	81.16	
17,986.00	89.75	0.69	11,890.31	5,515.16 N	1,018.83 W	510,029.56	725,502.47	0.24	5,589.98	81.16	
17,988.00	89.75	0.70	11,890.31	5,517.16 N	1,018.80 W	510,031.56	725,502.50	0.24	5,591.97	81.16	
17,990.00	89.75	0.70	11,890.32	5,519.16 N	1,018.78 W	510,033.56	725,502.52	0.24	5,593.96	81.16	
17,992.00	89.75	0.71	11,890.33	5,521.16 N	1,018.75 W	510,035.56	725,502.55	0.24	5,595.94	81.16	
17,994.00	89.75	0.71	11,890.34	5,523.16 N	1,018.73 W	510,037.56	725,502.57	0.24	5,597.93	81.16	
17,996.00	89.75	0.72	11,890.35	5,525.16 N	1,018.70 W	510,039.56	725,502.60	0.24	5,599.92	81.16	
17,998.00	89.75	0.72	11,890.36	5,527.16 N	1,018.68 W	510,041.56	725,502.62	0.24	5,601.91	81.16	
18,000.00	89.75	0.73	11,890.37	5,529.16 N	1,018.65 W	510,043.56	725,502.65	0.24	5,603.89	81.16	
18,002.00	89.75	0.73	11,890.38	5,531.16 N	1,018.63 W	510,045.56	725,502.67	0.24	5,605.88	81.16	
18,004.00	89.75	0.74	11,890.38	5,533.16 N	1,018.60 W	510,047.56	725,502.70	0.24	5,607.87	81.16	
18,006.00	89.75	0.74	11,890.39	5,535.16 N	1,018.58 W	510,049.56	725,502.72	0.24	5,609.85	81.16	
18,008.00	89.75	0.75	11,890.40	5,537.16 N	1,018.55 W	510,051.56	725,502.75	0.24	5,611.84	81.16	
18,010.00	89.75	0.75	11,890.41	5,539.16 N	1,018.52 W	510,053.56	725,502.78	0.24	5,613.83	81.16	
18,012.00	89.76	0.76	11,890.42	5,541.16 N	1,018.50 W	510,055.56	725,502.80	0.24	5,615.81	81.16	
18,014.00	89.76	0.76	11,890.43	5,543.16 N	1,018.47 W	510,057.56	725,502.83	0.24	5,617.80	81.16	
18,016.00	89.76	0.77	11,890.44	5,545.16 N	1,018.45 W	510,059.56	725,502.85	0.24	5,619.79	81.16	
18,018.00	89.76	0.77	11,890.44	5,547.16 N	1,018.42 W	510,061.56	725,502.88	0.24	5,621.77	81.16	
18,020.00	89.76	0.78	11,890.45	5,549.16 N	1,018.39 W	510,063.56	725,502.91	0.24	5,623.76	81.16	
18,022.00	89.76	0.78	11,890.46	5,551.16 N	1,018.36 W	510,065.56	725,502.94	0.24	5,625.75	81.16	
18,024.00	89.76	0.78	11,890.47	5,553.16 N	1,018.34 W	510,067.56	725,502.96	0.24	5,627.73	81.16	
18,026.00	89.76	0.79	11,890.48	5,555.16 N	1,018.31 W	510,069.56	725,502.99	0.24	5,629.72	81.16	
18,028.00	89.76	0.79	11,890.49	5,557.16 N	1,018.28 W	510,071.56	725,503.02	0.24	5,631.71	81.16	
18,030.00	89.76	0.80	11,890.49	5,559.16 N	1,018.25 W	510,073.56	725,503.05	0.24	5,633.69	81.16	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
18,032.00	89.76	0.80	11,890.50	5,561.16 N	1,018.23 W	510,075.56	725,503.07	0.24	5,635.68	81.16	
18,034.00	89.76	0.81	11,890.51	5,563.16 N	1,018.20 W	510,077.56	725,503.10	0.24	5,637.67	81.16	
18,036.00	89.76	0.81	11,890.52	5,565.16 N	1,018.17 W	510,079.56	725,503.13	0.24	5,639.65	81.16	
18,038.00	89.76	0.82	11,890.53	5,567.16 N	1,018.14 W	510,081.56	725,503.16	0.24	5,641.64	81.16	
18,040.00	89.77	0.82	11,890.54	5,569.16 N	1,018.11 W	510,083.56	725,503.19	0.24	5,643.63	81.16	
18,042.00	89.77	0.83	11,890.54	5,571.16 N	1,018.08 W	510,085.56	725,503.22	0.24	5,645.61	81.16	
18,044.00	89.77	0.83	11,890.55	5,573.16 N	1,018.05 W	510,087.56	725,503.25	0.24	5,647.60	81.16	
18,046.00	89.77	0.84	11,890.56	5,575.16 N	1,018.03 W	510,089.56	725,503.27	0.24	5,649.59	81.16	
18,048.00	89.77	0.84	11,890.57	5,577.16 N	1,018.00 W	510,091.56	725,503.30	0.24	5,651.57	81.16	
18,050.00	89.77	0.85	11,890.58	5,579.16 N	1,017.97 W	510,093.56	725,503.33	0.24	5,653.56	81.16	
18,052.00	89.77	0.85	11,890.58	5,581.16 N	1,017.94 W	510,095.56	725,503.36	0.24	5,655.55	81.16	
18,054.00	89.77	0.86	11,890.59	5,583.16 N	1,017.91 W	510,097.56	725,503.39	0.24	5,657.53	81.16	
18,056.00	89.77	0.86	11,890.60	5,585.16 N	1,017.88 W	510,099.56	725,503.42	0.24	5,659.52	81.16	
18,058.00	89.77	0.87	11,890.61	5,587.16 N	1,017.85 W	510,101.56	725,503.45	0.24	5,661.51	81.16	
18,060.00	89.77	0.87	11,890.62	5,589.15 N	1,017.82 W	510,103.55	725,503.48	0.24	5,663.49	81.16	
18,062.00	89.77	0.88	11,890.62	5,591.15 N	1,017.79 W	510,105.55	725,503.51	0.24	5,665.48	81.16	
18,064.00	89.77	0.88	11,890.63	5,593.15 N	1,017.76 W	510,107.55	725,503.54	0.24	5,667.47	81.16	
18,066.00	89.78	0.88	11,890.64	5,595.15 N	1,017.73 W	510,109.55	725,503.57	0.24	5,669.45	81.16	
18,068.00	89.78	0.89	11,890.65	5,597.15 N	1,017.69 W	510,111.55	725,503.61	0.24	5,671.44	81.16	
18,070.00	89.78	0.89	11,890.66	5,599.15 N	1,017.66 W	510,113.55	725,503.64	0.24	5,673.42	81.16	
18,072.00	89.78	0.90	11,890.66	5,601.15 N	1,017.63 W	510,115.55	725,503.67	0.24	5,675.41	81.16	
18,074.00	89.78	0.90	11,890.67	5,603.15 N	1,017.60 W	510,117.55	725,503.70	0.24	5,677.40	81.16	
18,076.00	89.78	0.91	11,890.68	5,605.15 N	1,017.57 W	510,119.55	725,503.73	0.24	5,679.38	81.16	
18,078.00	89.78	0.91	11,890.69	5,607.15 N	1,017.54 W	510,121.55	725,503.76	0.24	5,681.37	81.16	
18,080.00	89.78	0.92	11,890.69	5,609.15 N	1,017.50 W	510,123.55	725,503.80	0.24	5,683.36	81.16	
18,082.00	89.78	0.92	11,890.70	5,611.15 N	1,017.47 W	510,125.55	725,503.83	0.24	5,685.34	81.16	
18,084.00	89.78	0.93	11,890.71	5,613.15 N	1,017.44 W	510,127.55	725,503.86	0.24	5,687.33	81.16	
18,086.00	89.78	0.93	11,890.72	5,615.15 N	1,017.41 W	510,129.55	725,503.89	0.24	5,689.31	81.16	
18,088.00	89.78	0.94	11,890.72	5,617.15 N	1,017.38 W	510,131.55	725,503.92	0.24	5,691.30	81.16	
18,090.00	89.78	0.94	11,890.73	5,619.15 N	1,017.34 W	510,133.55	725,503.96	0.24	5,693.29	81.16	
18,092.00	89.78	0.95	11,890.74	5,621.15 N	1,017.31 W	510,135.55	725,503.99	0.24	5,695.27	81.16	
18,094.00	89.79	0.95	11,890.75	5,623.15 N	1,017.28 W	510,137.55	725,504.02	0.24	5,697.26	81.16	
18,096.00	89.79	0.96	11,890.76	5,625.15 N	1,017.24 W	510,139.55	725,504.06	0.24	5,699.24	81.16	
18,098.00	89.79	0.96	11,890.76	5,627.15 N	1,017.21 W	510,141.55	725,504.09	0.24	5,701.23	81.16	
18,100.00	89.79	0.97	11,890.77	5,629.15 N	1,017.18 W	510,143.55	725,504.12	0.24	5,703.22	81.16	
18,102.00	89.79	0.97	11,890.78	5,631.15 N	1,017.14 W	510,145.55	725,504.16	0.24	5,705.20	81.16	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
18,104.00	89.79	0.98	11,890.78	5,633.15 N	1,017.11 W	510,147.55	725,504.19	0.24	5,707.19	81.16	
18,106.00	89.79	0.98	11,890.79	5,635.15 N	1,017.07 W	510,149.55	725,504.23	0.24	5,709.17	81.16	
18,108.00	89.80	0.97	11,890.80	5,637.15 N	1,017.04 W	510,151.55	725,504.26	0.71	5,711.16	-40.79	
18,110.00	89.81	0.96	11,890.81	5,639.15 N	1,017.01 W	510,153.55	725,504.29	0.71	5,713.15	-40.79	
18,112.00	89.82	0.95	11,890.81	5,641.15 N	1,016.97 W	510,155.55	725,504.33	0.71	5,715.13	-40.79	
18,114.00	89.83	0.94	11,890.82	5,643.15 N	1,016.94 W	510,157.55	725,504.36	0.71	5,717.12	-40.79	
18,116.00	89.84	0.93	11,890.82	5,645.15 N	1,016.91 W	510,159.55	725,504.39	0.71	5,719.11	-40.79	
18,118.00	89.85	0.92	11,890.83	5,647.15 N	1,016.87 W	510,161.55	725,504.43	0.71	5,721.09	-40.79	
18,120.00	89.87	0.92	11,890.83	5,649.15 N	1,016.84 W	510,163.55	725,504.46	0.71	5,723.08	-40.79	
18,122.00	89.88	0.91	11,890.84	5,651.15 N	1,016.81 W	510,165.55	725,504.49	0.71	5,725.06	-40.79	
18,124.00	89.89	0.90	11,890.84	5,653.15 N	1,016.78 W	510,167.55	725,504.52	0.71	5,727.05	-40.79	
18,126.00	89.90	0.89	11,890.85	5,655.15 N	1,016.75 W	510,169.55	725,504.55	0.71	5,729.04	-40.79	
18,128.00	89.91	0.88	11,890.85	5,657.15 N	1,016.72 W	510,171.55	725,504.58	0.71	5,731.02	-40.79	
18,130.00	89.92	0.87	11,890.85	5,659.15 N	1,016.69 W	510,173.55	725,504.61	0.71	5,733.01	-40.79	
18,132.00	89.93	0.86	11,890.86	5,661.15 N	1,016.66 W	510,175.55	725,504.64	0.71	5,735.00	-40.79	
18,134.00	89.94	0.85	11,890.86	5,663.14 N	1,016.63 W	510,177.54	725,504.67	0.71	5,736.98	-40.79	
18,136.00	89.95	0.84	11,890.86	5,665.14 N	1,016.60 W	510,179.54	725,504.70	0.71	5,738.97	-40.79	
18,138.00	89.96	0.83	11,890.86	5,667.14 N	1,016.57 W	510,181.54	725,504.73	0.71	5,740.95	-40.79	
18,140.00	89.97	0.82	11,890.86	5,669.14 N	1,016.54 W	510,183.54	725,504.76	0.71	5,742.94	-40.79	
18,142.00	89.98	0.81	11,890.86	5,671.14 N	1,016.51 W	510,185.54	725,504.79	0.71	5,744.93	-40.79	
18,144.00	89.99	0.80	11,890.86	5,673.14 N	1,016.48 W	510,187.54	725,504.82	0.71	5,746.91	-40.79	
18,146.00	90.00	0.79	11,890.86	5,675.14 N	1,016.45 W	510,189.54	725,504.85	0.71	5,748.90	-40.79	
18,148.00	90.02	0.79	11,890.86	5,677.14 N	1,016.43 W	510,191.54	725,504.87	0.71	5,750.89	-40.79	
18,150.00	90.03	0.78	11,890.86	5,679.14 N	1,016.40 W	510,193.54	725,504.90	0.71	5,752.88	-40.79	
18,152.00	90.04	0.77	11,890.86	5,681.14 N	1,016.37 W	510,195.54	725,504.93	0.71	5,754.86	-40.79	
18,154.00	90.05	0.76	11,890.86	5,683.14 N	1,016.35 W	510,197.54	725,504.95	0.71	5,756.85	-40.79	
18,156.00	90.06	0.75	11,890.86	5,685.14 N	1,016.32 W	510,199.54	725,504.98	0.71	5,758.84	-40.79	
18,158.00	90.07	0.74	11,890.86	5,687.14 N	1,016.29 W	510,201.54	725,505.01	0.71	5,760.82	-40.79	
18,160.00	90.08	0.73	11,890.85	5,689.14 N	1,016.27 W	510,203.54	725,505.03	0.71	5,762.81	-40.79	
18,162.00	90.09	0.72	11,890.85	5,691.14 N	1,016.24 W	510,205.54	725,505.06	0.71	5,764.80	-40.79	
18,164.00	90.10	0.71	11,890.85	5,693.14 N	1,016.22 W	510,207.54	725,505.08	0.71	5,766.78	-40.79	
18,166.00	90.11	0.70	11,890.84	5,695.14 N	1,016.19 W	510,209.54	725,505.11	0.71	5,768.77	-40.79	
18,168.00	90.12	0.69	11,890.84	5,697.14 N	1,016.17 W	510,211.54	725,505.13	0.71	5,770.76	-40.79	
18,170.00	90.13	0.68	11,890.83	5,699.14 N	1,016.15 W	510,213.54	725,505.15	0.71	5,772.74	-40.79	
18,172.00	90.14	0.67	11,890.83	5,701.14 N	1,016.12 W	510,215.54	725,505.18	0.71	5,774.73	-40.79	
18,174.00	90.16	0.67	11,890.82	5,703.14 N	1,016.10 W	510,217.54	725,505.20	0.71	5,776.72	-40.79	
18,176.00	90.17	0.66	11,890.82	5,705.14 N	1,016.08 W	510,219.54	725,505.22	0.71	5,778.71	-40.79	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
18,178.00	90.18	0.65	11,890.81	5,707.14 N	1,016.05 W	510,221.54	725,505.25	0.71	5,780.69	-40.79	
18,180.00	90.19	0.64	11,890.81	5,709.14 N	1,016.03 W	510,223.54	725,505.27	0.71	5,782.68	-40.79	
18,182.00	90.20	0.63	11,890.80	5,711.14 N	1,016.01 W	510,225.54	725,505.29	0.71	5,784.67	-40.79	
18,184.00	90.21	0.62	11,890.79	5,713.14 N	1,015.99 W	510,227.54	725,505.31	0.71	5,786.66	-40.79	
18,186.00	90.22	0.61	11,890.79	5,715.14 N	1,015.96 W	510,229.54	725,505.34	0.71	5,788.64	-40.79	
18,188.00	90.23	0.60	11,890.78	5,717.14 N	1,015.94 W	510,231.54	725,505.36	0.71	5,790.63	-40.79	
18,190.00	90.24	0.59	11,890.77	5,719.14 N	1,015.92 W	510,233.54	725,505.38	0.71	5,792.62	-40.79	
18,192.00	90.25	0.58	11,890.76	5,721.14 N	1,015.90 W	510,235.54	725,505.40	0.71	5,794.61	-40.79	
18,194.00	90.26	0.57	11,890.75	5,723.14 N	1,015.88 W	510,237.54	725,505.42	0.71	5,796.59	-40.79	
18,196.00	90.27	0.56	11,890.74	5,725.14 N	1,015.86 W	510,239.54	725,505.44	0.71	5,798.58	-40.79	
18,198.00	90.28	0.55	11,890.73	5,727.14 N	1,015.84 W	510,241.54	725,505.46	0.71	5,800.57	-40.79	
18,200.00	90.29	0.54	11,890.72	5,729.14 N	1,015.82 W	510,243.54	725,505.48	0.71	5,802.56	-40.79	
18,202.00	90.29	0.55	11,890.71	5,731.14 N	1,015.80 W	510,245.54	725,505.50	0.29	5,804.54	105.49	
18,204.00	90.28	0.57	11,890.70	5,733.14 N	1,015.79 W	510,247.54	725,505.51	1.23	5,806.53	124.10	
18,206.00	90.27	0.59	11,890.69	5,735.14 N	1,015.76 W	510,249.54	725,505.54	1.23	5,808.52	124.10	
18,208.00	90.25	0.61	11,890.68	5,737.14 N	1,015.74 W	510,251.54	725,505.56	1.23	5,810.51	124.10	
18,210.00	90.24	0.63	11,890.68	5,739.14 N	1,015.72 W	510,253.54	725,505.58	1.23	5,812.49	124.10	
18,212.00	90.22	0.65	11,890.67	5,741.14 N	1,015.70 W	510,255.54	725,505.60	1.23	5,814.48	124.10	
18,214.00	90.21	0.67	11,890.66	5,743.14 N	1,015.68 W	510,257.54	725,505.62	1.23	5,816.47	124.10	
18,216.00	90.20	0.69	11,890.65	5,745.14 N	1,015.65 W	510,259.54	725,505.65	1.23	5,818.46	124.10	
18,218.00	90.18	0.71	11,890.65	5,747.14 N	1,015.63 W	510,261.54	725,505.67	1.23	5,820.44	124.10	
18,220.00	90.17	0.73	11,890.64	5,749.14 N	1,015.60 W	510,263.54	725,505.70	1.23	5,822.43	124.10	
18,222.00	90.15	0.75	11,890.63	5,751.14 N	1,015.58 W	510,265.54	725,505.72	1.23	5,824.42	124.10	
18,224.00	90.14	0.77	11,890.63	5,753.14 N	1,015.55 W	510,267.54	725,505.75	1.23	5,826.40	124.10	
18,226.00	90.13	0.80	11,890.62	5,755.14 N	1,015.52 W	510,269.54	725,505.78	1.23	5,828.39	124.10	
18,228.00	90.11	0.82	11,890.62	5,757.14 N	1,015.49 W	510,271.54	725,505.81	1.23	5,830.38	124.10	
18,230.00	90.10	0.84	11,890.62	5,759.14 N	1,015.47 W	510,273.54	725,505.83	1.23	5,832.36	124.10	
18,232.00	90.09	0.86	11,890.61	5,761.14 N	1,015.44 W	510,275.54	725,505.86	1.23	5,834.35	124.10	
18,234.00	90.07	0.88	11,890.61	5,763.14 N	1,015.41 W	510,277.54	725,505.89	1.23	5,836.34	124.10	
18,236.00	90.06	0.90	11,890.61	5,765.14 N	1,015.38 W	510,279.54	725,505.92	1.23	5,838.32	124.10	
18,238.00	90.04	0.92	11,890.61	5,767.14 N	1,015.34 W	510,281.54	725,505.96	1.23	5,840.31	124.10	
18,240.00	90.03	0.94	11,890.60	5,769.14 N	1,015.31 W	510,283.54	725,505.99	1.23	5,842.29	124.10	
18,242.00	90.02	0.96	11,890.60	5,771.14 N	1,015.28 W	510,285.54	725,506.02	1.23	5,844.28	124.10	
18,244.00	90.00	0.98	11,890.60	5,773.14 N	1,015.24 W	510,287.54	725,506.06	1.23	5,846.27	124.10	
18,246.00	89.99	1.00	11,890.60	5,775.14 N	1,015.21 W	510,289.54	725,506.09	1.23	5,848.25	124.10	
18,248.00	89.97	1.02	11,890.60	5,777.13 N	1,015.17 W	510,291.53	725,506.13	1.23	5,850.24	124.10	
18,250.00	89.96	1.04	11,890.61	5,779.13 N	1,015.14 W	510,293.53	725,506.16	1.23	5,852.22	124.10	

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Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
18,252.00	89.95	1.06	11,890.61	5,781.13 N	1,015.10 W	510,295.53	725,506.20	1.23	5,854.21	124.10	
18,254.00	89.93	1.08	11,890.61	5,783.13 N	1,015.06 W	510,297.53	725,506.24	1.23	5,856.20	124.10	
18,256.00	89.92	1.10	11,890.61	5,785.13 N	1,015.03 W	510,299.53	725,506.27	1.23	5,858.18	124.10	
18,258.00	89.91	1.12	11,890.62	5,787.13 N	1,014.99 W	510,301.53	725,506.31	1.23	5,860.17	124.10	
18,260.00	89.89	1.14	11,890.62	5,789.13 N	1,014.95 W	510,303.53	725,506.35	1.23	5,862.15	124.10	
18,262.00	89.88	1.16	11,890.62	5,791.13 N	1,014.91 W	510,305.53	725,506.39	1.23	5,864.14	124.10	
18,264.00	89.86	1.18	11,890.63	5,793.13 N	1,014.87 W	510,307.53	725,506.43	1.23	5,866.12	124.10	
18,266.00	89.85	1.20	11,890.63	5,795.13 N	1,014.83 W	510,309.53	725,506.47	1.23	5,868.11	124.10	
18,268.00	89.84	1.22	11,890.64	5,797.13 N	1,014.78 W	510,311.53	725,506.52	1.23	5,870.09	124.10	
18,270.00	89.82	1.24	11,890.64	5,799.13 N	1,014.74 W	510,313.53	725,506.56	1.23	5,872.08	124.10	
18,272.00	89.81	1.27	11,890.65	5,801.13 N	1,014.70 W	510,315.53	725,506.60	1.23	5,874.06	124.10	
18,274.00	89.80	1.29	11,890.66	5,803.13 N	1,014.65 W	510,317.53	725,506.65	1.23	5,876.05	124.10	
18,276.00	89.78	1.31	11,890.66	5,805.13 N	1,014.61 W	510,319.53	725,506.69	1.23	5,878.03	124.10	
18,278.00	89.77	1.33	11,890.67	5,807.13 N	1,014.56 W	510,321.53	725,506.74	1.23	5,880.02	124.10	
18,280.00	89.75	1.35	11,890.68	5,809.13 N	1,014.51 W	510,323.53	725,506.79	1.23	5,882.00	124.10	
18,282.00	89.74	1.37	11,890.69	5,811.13 N	1,014.47 W	510,325.53	725,506.83	1.23	5,883.98	124.10	
18,284.00	89.73	1.39	11,890.70	5,813.13 N	1,014.42 W	510,327.53	725,506.88	1.23	5,885.97	124.10	
18,286.00	89.71	1.41	11,890.71	5,815.13 N	1,014.37 W	510,329.53	725,506.93	1.23	5,887.95	124.10	
18,288.00	89.70	1.43	11,890.72	5,817.13 N	1,014.32 W	510,331.53	725,506.98	1.23	5,889.94	124.10	
18,290.00	89.68	1.45	11,890.73	5,819.12 N	1,014.27 W	510,333.52	725,507.03	1.23	5,891.92	124.10	
18,292.00	89.67	1.47	11,890.74	5,821.12 N	1,014.22 W	510,335.52	725,507.08	1.23	5,893.91	124.10	
18,294.00	89.66	1.49	11,890.75	5,823.12 N	1,014.17 W	510,337.52	725,507.13	1.23	5,895.89	124.10	
18,296.00	89.66	1.49	11,890.76	5,825.12 N	1,014.11 W	510,339.52	725,507.19	0.13	5,897.87	-105.60	
18,298.00	89.67	1.46	11,890.78	5,827.12 N	1,014.06 W	510,341.52	725,507.24	1.42	5,899.86	-64.01	
18,300.00	89.68	1.44	11,890.79	5,829.12 N	1,014.01 W	510,343.52	725,507.29	1.42	5,901.84	-64.01	
18,302.00	89.69	1.41	11,890.80	5,831.12 N	1,013.96 W	510,345.52	725,507.34	1.42	5,903.82	-64.01	
18,304.00	89.71	1.39	11,890.81	5,833.12 N	1,013.91 W	510,347.52	725,507.39	1.42	5,905.81	-64.01	
18,306.00	89.72	1.36	11,890.82	5,835.12 N	1,013.87 W	510,349.52	725,507.43	1.42	5,907.79	-64.01	
18,308.00	89.73	1.33	11,890.83	5,837.12 N	1,013.82 W	510,351.52	725,507.48	1.42	5,909.78	-64.01	
18,310.00	89.74	1.31	11,890.84	5,839.12 N	1,013.77 W	510,353.52	725,507.53	1.42	5,911.76	-64.01	
18,312.00	89.76	1.28	11,890.85	5,841.12 N	1,013.73 W	510,355.52	725,507.57	1.42	5,913.75	-64.01	
18,314.00	89.77	1.26	11,890.85	5,843.12 N	1,013.68 W	510,357.52	725,507.62	1.42	5,915.73	-64.01	
18,316.00	89.78	1.23	11,890.86	5,845.12 N	1,013.64 W	510,359.52	725,507.66	1.42	5,917.72	-64.01	
18,318.00	89.79	1.21	11,890.87	5,847.12 N	1,013.60 W	510,361.52	725,507.70	1.42	5,919.70	-64.01	
18,320.00	89.81	1.18	11,890.88	5,849.12 N	1,013.56 W	510,363.52	725,507.74	1.42	5,921.69	-64.01	
18,322.00	89.82	1.16	11,890.88	5,851.12 N	1,013.52 W	510,365.52	725,507.78	1.42	5,923.67	-64.01	

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Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
18,324.00	89.83	1.13	11,890.89	5,853.12 N	1,013.48 W	510,367.52	725,507.82	1.42	5,925.66	-64.01	
18,326.00	89.84	1.11	11,890.90	5,855.11 N	1,013.44 W	510,369.51	725,507.86	1.42	5,927.64	-64.01	
18,328.00	89.85	1.08	11,890.90	5,857.11 N	1,013.40 W	510,371.51	725,507.90	1.42	5,929.63	-64.01	
18,330.00	89.87	1.05	11,890.91	5,859.11 N	1,013.36 W	510,373.51	725,507.94	1.42	5,931.61	-64.01	
18,332.00	89.88	1.03	11,890.91	5,861.11 N	1,013.32 W	510,375.51	725,507.98	1.42	5,933.60	-64.01	
18,334.00	89.89	1.00	11,890.91	5,863.11 N	1,013.29 W	510,377.51	725,508.01	1.42	5,935.58	-64.01	
18,336.00	89.90	0.98	11,890.92	5,865.11 N	1,013.25 W	510,379.51	725,508.05	1.42	5,937.57	-64.01	
18,338.00	89.92	0.95	11,890.92	5,867.11 N	1,013.22 W	510,381.51	725,508.08	1.42	5,939.56	-64.01	
18,340.00	89.93	0.93	11,890.92	5,869.11 N	1,013.19 W	510,383.51	725,508.11	1.42	5,941.54	-64.01	
18,342.00	89.94	0.90	11,890.93	5,871.11 N	1,013.16 W	510,385.51	725,508.14	1.42	5,943.53	-64.01	
18,344.00	89.95	0.88	11,890.93	5,873.11 N	1,013.13 W	510,387.51	725,508.17	1.42	5,945.52	-64.01	
18,346.00	89.97	0.85	11,890.93	5,875.11 N	1,013.09 W	510,389.51	725,508.21	1.42	5,947.50	-64.01	
18,348.00	89.98	0.82	11,890.93	5,877.11 N	1,013.07 W	510,391.51	725,508.23	1.42	5,949.49	-64.01	
18,350.00	89.99	0.80	11,890.93	5,879.11 N	1,013.04 W	510,393.51	725,508.26	1.42	5,951.47	-64.01	
18,352.00	90.00	0.77	11,890.93	5,881.11 N	1,013.01 W	510,395.51	725,508.29	1.42	5,953.46	-64.01	
18,354.00	90.02	0.75	11,890.93	5,883.11 N	1,012.98 W	510,397.51	725,508.32	1.42	5,955.45	-64.01	
18,356.00	90.03	0.72	11,890.93	5,885.11 N	1,012.96 W	510,399.51	725,508.34	1.42	5,957.44	-64.01	
18,358.00	90.04	0.70	11,890.93	5,887.11 N	1,012.93 W	510,401.51	725,508.37	1.42	5,959.42	-64.01	
18,360.00	90.05	0.67	11,890.93	5,889.11 N	1,012.91 W	510,403.51	725,508.39	1.42	5,961.41	-64.01	
18,362.00	90.07	0.65	11,890.92	5,891.11 N	1,012.89 W	510,405.51	725,508.41	1.42	5,963.40	-64.01	
18,364.00	90.08	0.62	11,890.92	5,893.11 N	1,012.86 W	510,407.51	725,508.44	1.42	5,965.38	-64.01	
18,366.00	90.09	0.60	11,890.92	5,895.11 N	1,012.84 W	510,409.51	725,508.46	1.42	5,967.37	-64.01	
18,368.00	90.10	0.57	11,890.92	5,897.11 N	1,012.82 W	510,411.51	725,508.48	1.42	5,969.36	-64.01	
18,370.00	90.12	0.54	11,890.91	5,899.11 N	1,012.80 W	510,413.51	725,508.50	1.42	5,971.35	-64.01	
18,372.00	90.13	0.52	11,890.91	5,901.11 N	1,012.78 W	510,415.51	725,508.52	1.42	5,973.33	-64.01	
18,374.00	90.14	0.49	11,890.90	5,903.11 N	1,012.77 W	510,417.51	725,508.53	1.42	5,975.32	-64.01	
18,376.00	90.15	0.47	11,890.90	5,905.11 N	1,012.75 W	510,419.51	725,508.55	1.42	5,977.31	-64.01	
18,378.00	90.17	0.44	11,890.89	5,907.11 N	1,012.73 W	510,421.51	725,508.57	1.42	5,979.30	-64.01	
18,380.00	90.18	0.42	11,890.89	5,909.11 N	1,012.72 W	510,423.51	725,508.58	1.42	5,981.29	-64.01	
18,382.00	90.19	0.39	11,890.88	5,911.11 N	1,012.70 W	510,425.51	725,508.60	1.42	5,983.27	-64.01	
18,384.00	90.20	0.37	11,890.87	5,913.11 N	1,012.69 W	510,427.51	725,508.61	1.42	5,985.26	-64.01	
18,386.00	90.22	0.34	11,890.87	5,915.11 N	1,012.68 W	510,429.51	725,508.62	1.42	5,987.25	-64.01	
18,388.00	90.23	0.32	11,890.86	5,917.11 N	1,012.67 W	510,431.51	725,508.63	1.42	5,989.24	-64.01	
18,390.00	90.24	0.29	11,890.85	5,919.11 N	1,012.66 W	510,433.51	725,508.64	1.42	5,991.23	-64.01	
18,392.00	90.25	0.34	11,890.84	5,921.11 N	1,012.65 W	510,435.51	725,508.65	2.76	5,993.22	78.55	
18,394.00	90.26	0.40	11,890.83	5,923.11 N	1,012.63 W	510,437.51	725,508.67	2.76	5,995.21	78.55	
18,396.00	90.27	0.45	11,890.82	5,925.11 N	1,012.62 W	510,439.51	725,508.68	2.76	5,997.19	78.55	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
18,398.00	90.28	0.51	11,890.81	5,927.11 N	1,012.60 W	510,441.51	725,508.70	2.76	5,999.18	78.55	
18,400.00	90.29	0.56	11,890.80	5,929.11 N	1,012.58 W	510,443.51	725,508.72	2.76	6,001.17	78.55	
18,402.00	90.31	0.61	11,890.79	5,931.11 N	1,012.56 W	510,445.51	725,508.74	2.76	6,003.16	78.55	
18,404.00	90.32	0.67	11,890.78	5,933.11 N	1,012.54 W	510,447.51	725,508.76	2.76	6,005.14	78.55	
18,406.00	90.33	0.72	11,890.77	5,935.11 N	1,012.52 W	510,449.51	725,508.78	2.76	6,007.13	78.55	
18,408.00	90.34	0.78	11,890.76	5,937.11 N	1,012.49 W	510,451.51	725,508.81	2.76	6,009.12	78.55	
18,410.00	90.35	0.83	11,890.75	5,939.11 N	1,012.46 W	510,453.51	725,508.84	2.76	6,011.10	78.55	
18,412.00	90.36	0.89	11,890.73	5,941.11 N	1,012.43 W	510,455.51	725,508.87	2.76	6,013.09	78.55	
18,414.00	90.37	0.94	11,890.72	5,943.11 N	1,012.40 W	510,457.51	725,508.90	2.76	6,015.08	78.55	
18,416.00	90.38	0.99	11,890.71	5,945.11 N	1,012.37 W	510,459.51	725,508.93	2.76	6,017.06	78.56	
18,418.00	90.39	1.05	11,890.69	5,947.11 N	1,012.33 W	510,461.51	725,508.97	2.76	6,019.05	78.56	
18,420.00	90.40	1.10	11,890.68	5,949.11 N	1,012.29 W	510,463.51	725,509.01	2.76	6,021.03	78.56	
18,422.00	90.42	1.16	11,890.67	5,951.11 N	1,012.25 W	510,465.51	725,509.05	2.76	6,023.02	78.56	
18,424.00	90.43	1.21	11,890.65	5,953.11 N	1,012.21 W	510,467.51	725,509.09	2.76	6,025.00	78.56	
18,426.00	90.44	1.26	11,890.64	5,955.10 N	1,012.17 W	510,469.50	725,509.13	2.76	6,026.99	78.56	
18,428.00	90.45	1.32	11,890.62	5,957.10 N	1,012.12 W	510,471.50	725,509.18	2.76	6,028.97	78.56	
18,430.00	90.46	1.37	11,890.61	5,959.10 N	1,012.08 W	510,473.50	725,509.22	2.76	6,030.96	78.56	
18,432.00	90.47	1.43	11,890.59	5,961.10 N	1,012.03 W	510,475.50	725,509.27	2.76	6,032.94	78.56	
18,434.00	90.48	1.48	11,890.57	5,963.10 N	1,011.98 W	510,477.50	725,509.32	2.76	6,034.93	78.56	
18,436.00	90.49	1.53	11,890.56	5,965.10 N	1,011.92 W	510,479.50	725,509.38	2.76	6,036.91	78.56	
18,438.00	90.50	1.59	11,890.54	5,967.10 N	1,011.87 W	510,481.50	725,509.43	2.76	6,038.89	78.56	
18,440.00	90.51	1.64	11,890.52	5,969.10 N	1,011.81 W	510,483.50	725,509.49	2.76	6,040.88	78.56	
18,442.00	90.52	1.70	11,890.50	5,971.10 N	1,011.76 W	510,485.50	725,509.54	2.76	6,042.86	78.56	
18,444.00	90.54	1.75	11,890.48	5,973.10 N	1,011.70 W	510,487.50	725,509.60	2.76	6,044.84	78.56	
18,446.00	90.55	1.80	11,890.47	5,975.10 N	1,011.63 W	510,489.50	725,509.67	2.76	6,046.82	78.56	
18,448.00	90.56	1.86	11,890.45	5,977.10 N	1,011.57 W	510,491.50	725,509.73	2.76	6,048.81	78.56	
18,450.00	90.57	1.91	11,890.43	5,979.09 N	1,011.50 W	510,493.49	725,509.80	2.76	6,050.79	78.56	
18,452.00	90.58	1.97	11,890.41	5,981.09 N	1,011.44 W	510,495.49	725,509.86	2.76	6,052.77	78.56	
18,454.00	90.59	2.02	11,890.39	5,983.09 N	1,011.37 W	510,497.49	725,509.93	2.76	6,054.75	78.56	
18,456.00	90.60	2.08	11,890.36	5,985.09 N	1,011.29 W	510,499.49	725,510.01	2.76	6,056.73	78.56	
18,458.00	90.61	2.13	11,890.34	5,987.09 N	1,011.22 W	510,501.49	725,510.08	2.76	6,058.71	78.56	
18,460.00	90.62	2.18	11,890.32	5,989.09 N	1,011.15 W	510,503.49	725,510.15	2.76	6,060.69	78.57	
18,462.00	90.63	2.24	11,890.30	5,991.09 N	1,011.07 W	510,505.49	725,510.23	2.76	6,062.67	78.57	
18,464.00	90.65	2.29	11,890.28	5,993.08 N	1,010.99 W	510,507.48	725,510.31	2.76	6,064.65	78.57	
18,466.00	90.66	2.35	11,890.26	5,995.08 N	1,010.91 W	510,509.48	725,510.39	2.76	6,066.63	78.57	
18,468.00	90.67	2.40	11,890.23	5,997.08 N	1,010.83 W	510,511.48	725,510.47	2.76	6,068.61	78.57	
18,470.00	90.68	2.45	11,890.21	5,999.08 N	1,010.74 W	510,513.48	725,510.56	2.76	6,070.59	78.57	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
18,472.00	90.69	2.51	11,890.18	6,001.08 N	1,010.66 W	510,515.48	725,510.64	2.76	6,072.57	78.57	
18,474.00	90.70	2.56	11,890.16	6,003.07 N	1,010.57 W	510,517.47	725,510.73	2.76	6,074.55	78.57	
18,476.00	90.71	2.62	11,890.14	6,005.07 N	1,010.48 W	510,519.47	725,510.82	2.76	6,076.53	78.57	
18,478.00	90.72	2.67	11,890.11	6,007.07 N	1,010.38 W	510,521.47	725,510.92	2.76	6,078.51	78.57	
18,480.00	90.73	2.72	11,890.09	6,009.07 N	1,010.29 W	510,523.47	725,511.01	2.76	6,080.48	78.57	
18,482.00	90.74	2.78	11,890.06	6,011.07 N	1,010.19 W	510,525.47	725,511.11	2.76	6,082.46	78.57	
18,484.00	90.75	2.83	11,890.03	6,013.06 N	1,010.10 W	510,527.46	725,511.20	2.76	6,084.44	78.57	
18,486.00	90.75	2.85	11,890.01	6,015.06 N	1,010.00 W	510,529.46	725,511.30	0.85	6,086.42	115.43	
18,488.00	90.72	2.82	11,889.98	6,017.06 N	1,009.90 W	510,531.46	725,511.40	1.73	6,088.39	-137.49	
18,490.00	90.70	2.80	11,889.96	6,019.06 N	1,009.80 W	510,533.46	725,511.50	1.73	6,090.37	-137.49	
18,492.00	90.67	2.78	11,889.93	6,021.05 N	1,009.70 W	510,535.45	725,511.60	1.73	6,092.35	-137.49	
18,494.00	90.65	2.75	11,889.91	6,023.05 N	1,009.61 W	510,537.45	725,511.69	1.73	6,094.33	-137.49	
18,496.00	90.62	2.73	11,889.89	6,025.05 N	1,009.51 W	510,539.45	725,511.79	1.73	6,096.30	-137.49	
18,498.00	90.59	2.71	11,889.87	6,027.05 N	1,009.41 W	510,541.45	725,511.89	1.73	6,098.28	-137.49	
18,500.00	90.57	2.68	11,889.85	6,029.04 N	1,009.32 W	510,543.44	725,511.98	1.73	6,100.26	-137.49	
18,502.00	90.54	2.66	11,889.83	6,031.04 N	1,009.23 W	510,545.44	725,512.07	1.73	6,102.24	-137.49	
18,504.00	90.52	2.64	11,889.81	6,033.04 N	1,009.14 W	510,547.44	725,512.16	1.73	6,104.22	-137.49	
18,506.00	90.49	2.61	11,889.79	6,035.04 N	1,009.04 W	510,549.44	725,512.26	1.73	6,106.19	-137.49	
18,508.00	90.47	2.59	11,889.77	6,037.03 N	1,008.95 W	510,551.43	725,512.35	1.73	6,108.17	-137.49	
18,510.00	90.44	2.57	11,889.76	6,039.03 N	1,008.86 W	510,553.43	725,512.44	1.73	6,110.15	-137.49	
18,512.00	90.42	2.54	11,889.74	6,041.03 N	1,008.77 W	510,555.43	725,512.53	1.73	6,112.13	-137.49	
18,514.00	90.39	2.52	11,889.73	6,043.03 N	1,008.69 W	510,557.43	725,512.61	1.73	6,114.11	-137.49	
18,516.00	90.36	2.50	11,889.72	6,045.03 N	1,008.60 W	510,559.43	725,512.70	1.73	6,116.09	-137.49	
18,518.00	90.34	2.47	11,889.70	6,047.02 N	1,008.51 W	510,561.42	725,512.79	1.73	6,118.07	-137.49	
18,520.00	90.31	2.45	11,889.69	6,049.02 N	1,008.43 W	510,563.42	725,512.87	1.73	6,120.05	-137.49	
18,522.00	90.29	2.43	11,889.68	6,051.02 N	1,008.34 W	510,565.42	725,512.96	1.73	6,122.02	-137.49	
18,524.00	90.26	2.40	11,889.67	6,053.02 N	1,008.26 W	510,567.42	725,513.04	1.73	6,124.00	-137.49	
18,526.00	90.24	2.38	11,889.66	6,055.02 N	1,008.17 W	510,569.42	725,513.13	1.73	6,125.98	-137.49	
18,528.00	90.21	2.36	11,889.66	6,057.02 N	1,008.09 W	510,571.42	725,513.21	1.73	6,127.96	-137.49	
18,530.00	90.19	2.33	11,889.65	6,059.01 N	1,008.01 W	510,573.41	725,513.29	1.73	6,129.94	-137.49	
18,532.00	90.16	2.31	11,889.64	6,061.01 N	1,007.93 W	510,575.41	725,513.37	1.73	6,131.92	-137.49	
18,534.00	90.13	2.29	11,889.64	6,063.01 N	1,007.85 W	510,577.41	725,513.45	1.73	6,133.90	-137.49	
18,536.00	90.11	2.26	11,889.63	6,065.01 N	1,007.77 W	510,579.41	725,513.53	1.73	6,135.88	-137.49	
18,538.00	90.08	2.24	11,889.63	6,067.01 N	1,007.69 W	510,581.41	725,513.61	1.73	6,137.86	-137.49	
18,540.00	90.06	2.22	11,889.63	6,069.01 N	1,007.61 W	510,583.41	725,513.69	1.73	6,139.84	-137.49	
18,542.00	90.03	2.19	11,889.63	6,071.00 N	1,007.53 W	510,585.40	725,513.77	1.73	6,141.82	-137.49	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
18,544.00	90.01	2.17	11,889.63	6,073.00 N	1,007.46 W	510,587.40	725,513.84	1.73	6,143.80	-137.49	
18,546.00	89.98	2.15	11,889.63	6,075.00 N	1,007.38 W	510,589.40	725,513.92	1.73	6,145.78	-137.49	
18,548.00	89.96	2.12	11,889.63	6,077.00 N	1,007.31 W	510,591.40	725,513.99	1.73	6,147.77	-137.49	
18,550.00	89.93	2.10	11,889.63	6,079.00 N	1,007.23 W	510,593.40	725,514.07	1.73	6,149.75	-137.49	
18,552.00	89.90	2.08	11,889.63	6,081.00 N	1,007.16 W	510,595.40	725,514.14	1.73	6,151.73	-137.49	
18,554.00	89.88	2.05	11,889.64	6,083.00 N	1,007.09 W	510,597.40	725,514.21	1.73	6,153.71	-137.49	
18,556.00	89.85	2.03	11,889.64	6,084.99 N	1,007.02 W	510,599.39	725,514.28	1.73	6,155.69	-137.49	
18,558.00	89.83	2.01	11,889.65	6,086.99 N	1,006.95 W	510,601.39	725,514.35	1.73	6,157.67	-137.49	
18,560.00	89.80	1.98	11,889.65	6,088.99 N	1,006.88 W	510,603.39	725,514.42	1.73	6,159.65	-137.49	
18,562.00	89.78	1.96	11,889.66	6,090.99 N	1,006.81 W	510,605.39	725,514.49	1.73	6,161.63	-137.49	
18,564.00	89.75	1.94	11,889.67	6,092.99 N	1,006.74 W	510,607.39	725,514.56	1.73	6,163.62	-137.49	
18,566.00	89.73	1.91	11,889.68	6,094.99 N	1,006.67 W	510,609.39	725,514.63	1.73	6,165.60	-137.49	
18,568.00	89.70	1.89	11,889.69	6,096.99 N	1,006.61 W	510,611.39	725,514.69	1.73	6,167.58	-137.49	
18,570.00	89.67	1.87	11,889.70	6,098.99 N	1,006.54 W	510,613.39	725,514.76	1.73	6,169.56	-137.49	
18,572.00	89.65	1.84	11,889.71	6,100.99 N	1,006.48 W	510,615.39	725,514.82	1.73	6,171.54	-137.49	
18,574.00	89.62	1.82	11,889.72	6,102.98 N	1,006.41 W	510,617.38	725,514.89	1.73	6,173.53	-137.49	
18,576.00	89.60	1.80	11,889.74	6,104.98 N	1,006.35 W	510,619.38	725,514.95	1.73	6,175.51	-137.49	
18,578.00	89.57	1.77	11,889.75	6,106.98 N	1,006.29 W	510,621.38	725,515.01	1.73	6,177.49	-137.49	
18,580.00	89.57	1.74	11,889.77	6,108.98 N	1,006.23 W	510,623.38	725,515.07	1.39	6,179.47	-102.34	
18,582.00	89.58	1.71	11,889.78	6,110.98 N	1,006.17 W	510,625.38	725,515.13	1.68	6,181.46	-66.00	
18,584.00	89.59	1.68	11,889.79	6,112.98 N	1,006.11 W	510,627.38	725,515.19	1.68	6,183.44	-66.00	
18,586.00	89.61	1.65	11,889.81	6,114.98 N	1,006.05 W	510,629.38	725,515.25	1.68	6,185.42	-66.00	
18,588.00	89.62	1.62	11,889.82	6,116.98 N	1,005.99 W	510,631.38	725,515.31	1.68	6,187.40	-66.00	
18,590.00	89.64	1.59	11,889.84	6,118.98 N	1,005.94 W	510,633.38	725,515.36	1.68	6,189.39	-66.00	
18,592.00	89.65	1.56	11,889.85	6,120.98 N	1,005.88 W	510,635.38	725,515.42	1.68	6,191.37	-66.00	
18,594.00	89.66	1.53	11,889.86	6,122.98 N	1,005.83 W	510,637.38	725,515.47	1.68	6,193.35	-66.00	
18,596.00	89.68	1.50	11,889.87	6,124.97 N	1,005.77 W	510,639.37	725,515.53	1.68	6,195.34	-66.00	
18,598.00	89.69	1.47	11,889.88	6,126.97 N	1,005.72 W	510,641.37	725,515.58	1.68	6,197.32	-66.00	
18,600.00	89.70	1.44	11,889.89	6,128.97 N	1,005.67 W	510,643.37	725,515.63	1.68	6,199.31	-66.00	
18,602.00	89.72	1.41	11,889.90	6,130.97 N	1,005.62 W	510,645.37	725,515.68	1.68	6,201.29	-66.00	
18,604.00	89.73	1.38	11,889.91	6,132.97 N	1,005.57 W	510,647.37	725,515.73	1.68	6,203.27	-66.00	
18,606.00	89.74	1.35	11,889.92	6,134.97 N	1,005.53 W	510,649.37	725,515.77	1.68	6,205.26	-66.00	
18,608.00	89.76	1.31	11,889.93	6,136.97 N	1,005.48 W	510,651.37	725,515.82	1.68	6,207.24	-66.00	
18,610.00	89.77	1.28	11,889.94	6,138.97 N	1,005.43 W	510,653.37	725,515.87	1.68	6,209.23	-66.00	
18,612.00	89.79	1.25	11,889.95	6,140.97 N	1,005.39 W	510,655.37	725,515.91	1.68	6,211.21	-66.00	
18,614.00	89.80	1.22	11,889.95	6,142.97 N	1,005.35 W	510,657.37	725,515.95	1.68	6,213.20	-66.00	
18,616.00	89.81	1.19	11,889.96	6,144.97 N	1,005.30 W	510,659.37	725,516.00	1.68	6,215.18	-66.00	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates (usft)		Map Coordinates (usft)		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing	Easting	Northing	Easting				
18,618.00	89.83	1.16	11,889.97	6,146.97 N	1,005.26 W	510,661.37	725,516.04	1.68	6,217.17	-66.00	
18,620.00	89.84	1.13	11,889.97	6,148.97 N	1,005.22 W	510,663.37	725,516.08	1.68	6,219.15	-66.00	
18,622.00	89.85	1.10	11,889.98	6,150.97 N	1,005.18 W	510,665.37	725,516.12	1.68	6,221.14	-66.00	
18,624.00	89.87	1.07	11,889.98	6,152.97 N	1,005.15 W	510,667.37	725,516.15	1.68	6,223.12	-66.00	
18,626.00	89.88	1.04	11,889.99	6,154.97 N	1,005.11 W	510,669.37	725,516.19	1.68	6,225.11	-66.00	
18,628.00	89.90	1.01	11,889.99	6,156.97 N	1,005.07 W	510,671.37	725,516.23	1.68	6,227.10	-66.00	
18,630.00	89.91	0.98	11,889.99	6,158.97 N	1,005.04 W	510,673.37	725,516.26	1.68	6,229.08	-66.00	
18,632.00	89.92	0.95	11,890.00	6,160.97 N	1,005.01 W	510,675.37	725,516.29	1.68	6,231.07	-66.00	
18,634.00	89.94	0.91	11,890.00	6,162.97 N	1,004.97 W	510,677.37	725,516.33	1.68	6,233.05	-66.00	
18,636.00	89.95	0.88	11,890.00	6,164.97 N	1,004.94 W	510,679.37	725,516.36	1.68	6,235.04	-66.00	
18,638.00	89.96	0.85	11,890.00	6,166.97 N	1,004.91 W	510,681.37	725,516.39	1.68	6,237.03	-66.00	
18,640.00	89.98	0.82	11,890.00	6,168.96 N	1,004.88 W	510,683.36	725,516.42	1.68	6,239.01	-66.00	
18,642.00	89.99	0.79	11,890.00	6,170.96 N	1,004.85 W	510,685.36	725,516.45	1.68	6,241.00	-66.00	
18,644.00	90.00	0.76	11,890.00	6,172.96 N	1,004.83 W	510,687.36	725,516.47	1.68	6,242.99	-66.00	
18,646.00	90.02	0.73	11,890.00	6,174.96 N	1,004.80 W	510,689.36	725,516.50	1.68	6,244.97	-66.00	
18,648.00	90.03	0.70	11,890.00	6,176.96 N	1,004.78 W	510,691.36	725,516.52	1.68	6,246.96	-66.00	
18,650.00	90.05	0.67	11,890.00	6,178.96 N	1,004.75 W	510,693.36	725,516.55	1.68	6,248.95	-66.00	
18,652.00	90.06	0.64	11,890.00	6,180.96 N	1,004.73 W	510,695.36	725,516.57	1.68	6,250.93	-66.00	
18,654.00	90.07	0.61	11,890.00	6,182.96 N	1,004.71 W	510,697.36	725,516.59	1.68	6,252.92	-66.00	
18,656.00	90.09	0.58	11,890.00	6,184.96 N	1,004.69 W	510,699.36	725,516.61	1.68	6,254.91	-66.00	
18,658.00	90.10	0.55	11,889.99	6,186.96 N	1,004.67 W	510,701.36	725,516.63	1.68	6,256.90	-66.00	
18,660.00	90.11	0.52	11,889.99	6,188.96 N	1,004.65 W	510,703.36	725,516.65	1.68	6,258.88	-66.00	
18,662.00	90.13	0.48	11,889.98	6,190.96 N	1,004.63 W	510,705.36	725,516.67	1.68	6,260.87	-66.00	
18,664.00	90.14	0.45	11,889.98	6,192.96 N	1,004.62 W	510,707.36	725,516.68	1.68	6,262.86	-66.00	
18,666.00	90.16	0.42	11,889.97	6,194.96 N	1,004.60 W	510,709.36	725,516.70	1.68	6,264.85	-66.00	
18,668.00	90.17	0.39	11,889.97	6,196.96 N	1,004.59 W	510,711.36	725,516.71	1.68	6,266.84	-66.00	
18,670.00	90.18	0.36	11,889.96	6,198.96 N	1,004.57 W	510,713.36	725,516.73	1.68	6,268.83	-66.00	
18,672.00	90.20	0.33	11,889.96	6,200.96 N	1,004.56 W	510,715.36	725,516.74	1.68	6,270.81	-66.00	
18,674.00	90.21	0.30	11,889.95	6,202.96 N	1,004.55 W	510,717.36	725,516.75	1.68	6,272.80	-66.00	
18,676.00	90.23	0.34	11,889.94	6,204.96 N	1,004.54 W	510,719.36	725,516.76	2.37	6,274.79	60.12	
18,678.00	90.26	0.38	11,889.93	6,206.96 N	1,004.53 W	510,721.36	725,516.77	2.37	6,276.78	60.12	
18,680.00	90.28	0.42	11,889.92	6,208.96 N	1,004.51 W	510,723.36	725,516.79	2.37	6,278.77	60.12	
18,682.00	90.30	0.46	11,889.91	6,210.96 N	1,004.50 W	510,725.36	725,516.80	2.37	6,280.76	60.12	
18,684.00	90.33	0.51	11,889.90	6,212.96 N	1,004.48 W	510,727.36	725,516.82	2.37	6,282.74	60.12	
18,686.00	90.35	0.55	11,889.89	6,214.96 N	1,004.46 W	510,729.36	725,516.84	2.37	6,284.73	60.12	
18,688.00	90.38	0.59	11,889.88	6,216.96 N	1,004.44 W	510,731.36	725,516.86	2.37	6,286.72	60.12	
18,690.00	90.40	0.63	11,889.86	6,218.96 N	1,004.42 W	510,733.36	725,516.88	2.37	6,288.71	60.12	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
18,692.00	90.42	0.67	11,889.85	6,220.96 N	1,004.40 W	510,735.36	725,516.90	2.37	6,290.69	60.12	
18,694.00	90.45	0.71	11,889.83	6,222.96 N	1,004.37 W	510,737.36	725,516.93	2.37	6,292.68	60.12	
18,696.00	90.47	0.75	11,889.82	6,224.96 N	1,004.35 W	510,739.36	725,516.95	2.37	6,294.67	60.12	
18,698.00	90.49	0.79	11,889.80	6,226.96 N	1,004.32 W	510,741.36	725,516.98	2.37	6,296.65	60.12	
18,700.00	90.52	0.83	11,889.78	6,228.96 N	1,004.29 W	510,743.36	725,517.01	2.37	6,298.64	60.12	
18,702.00	90.54	0.87	11,889.77	6,230.96 N	1,004.26 W	510,745.36	725,517.04	2.37	6,300.63	60.12	
18,704.00	90.56	0.92	11,889.75	6,232.96 N	1,004.23 W	510,747.36	725,517.07	2.37	6,302.61	60.12	
18,706.00	90.59	0.96	11,889.73	6,234.96 N	1,004.20 W	510,749.36	725,517.10	2.37	6,304.60	60.12	
18,708.00	90.61	1.00	11,889.71	6,236.96 N	1,004.17 W	510,751.36	725,517.13	2.37	6,306.59	60.12	
18,710.00	90.63	1.04	11,889.68	6,238.96 N	1,004.13 W	510,753.36	725,517.17	2.37	6,308.57	60.12	
18,712.00	90.66	1.08	11,889.66	6,240.96 N	1,004.09 W	510,755.36	725,517.21	2.37	6,310.56	60.12	
18,714.00	90.68	1.12	11,889.64	6,242.96 N	1,004.05 W	510,757.36	725,517.25	2.37	6,312.54	60.12	
18,716.00	90.71	1.16	11,889.61	6,244.96 N	1,004.01 W	510,759.36	725,517.29	2.37	6,314.53	60.12	
18,718.00	90.73	1.20	11,889.59	6,246.96 N	1,003.97 W	510,761.36	725,517.33	2.37	6,316.51	60.12	
18,720.00	90.75	1.24	11,889.56	6,248.96 N	1,003.93 W	510,763.36	725,517.37	2.37	6,318.50	60.12	
18,722.00	90.78	1.29	11,889.54	6,250.96 N	1,003.89 W	510,765.36	725,517.41	2.37	6,320.48	60.12	
18,724.00	90.80	1.33	11,889.51	6,252.96 N	1,003.84 W	510,767.36	725,517.46	2.37	6,322.47	60.12	
18,726.00	90.82	1.37	11,889.48	6,254.95 N	1,003.79 W	510,769.35	725,517.51	2.37	6,324.45	60.13	
18,728.00	90.85	1.41	11,889.45	6,256.95 N	1,003.75 W	510,771.35	725,517.55	2.37	6,326.43	60.13	
18,730.00	90.87	1.45	11,889.42	6,258.95 N	1,003.70 W	510,773.35	725,517.60	2.37	6,328.42	60.13	
18,732.00	90.89	1.49	11,889.39	6,260.95 N	1,003.64 W	510,775.35	725,517.66	2.37	6,330.40	60.13	
18,734.00	90.92	1.53	11,889.36	6,262.95 N	1,003.59 W	510,777.35	725,517.71	2.37	6,332.38	60.13	
18,736.00	90.94	1.57	11,889.33	6,264.95 N	1,003.54 W	510,779.35	725,517.76	2.37	6,334.37	60.13	
18,738.00	90.96	1.61	11,889.29	6,266.95 N	1,003.48 W	510,781.35	725,517.82	2.37	6,336.35	60.13	
18,740.00	90.99	1.65	11,889.26	6,268.95 N	1,003.42 W	510,783.35	725,517.88	2.37	6,338.33	60.13	
18,742.00	91.01	1.70	11,889.22	6,270.95 N	1,003.37 W	510,785.35	725,517.93	2.37	6,340.32	60.13	
18,744.00	91.04	1.74	11,889.19	6,272.95 N	1,003.31 W	510,787.35	725,517.99	2.37	6,342.30	60.13	
18,746.00	91.06	1.78	11,889.15	6,274.94 N	1,003.24 W	510,789.34	725,518.06	2.37	6,344.28	60.13	
18,748.00	91.08	1.82	11,889.11	6,276.94 N	1,003.18 W	510,791.34	725,518.12	2.37	6,346.26	60.13	
18,750.00	91.11	1.86	11,889.08	6,278.94 N	1,003.12 W	510,793.34	725,518.18	2.37	6,348.24	60.13	
18,752.00	91.13	1.90	11,889.04	6,280.94 N	1,003.05 W	510,795.34	725,518.25	2.37	6,350.23	60.13	
18,754.00	91.15	1.94	11,889.00	6,282.94 N	1,002.99 W	510,797.34	725,518.31	2.37	6,352.21	60.13	
18,756.00	91.18	1.98	11,888.96	6,284.94 N	1,002.92 W	510,799.34	725,518.38	2.37	6,354.19	60.14	
18,758.00	91.20	2.02	11,888.91	6,286.94 N	1,002.85 W	510,801.34	725,518.45	2.37	6,356.17	60.14	
18,760.00	91.22	2.07	11,888.87	6,288.93 N	1,002.78 W	510,803.33	725,518.52	2.37	6,358.15	60.14	
18,762.00	91.25	2.11	11,888.83	6,290.93 N	1,002.70 W	510,805.33	725,518.60	2.37	6,360.13	60.14	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
18,764.00	91.27	2.15	11,888.79	6,292.93 N	1,002.63 W	510,807.33	725,518.67	2.37	6,362.11	60.14	
18,766.00	91.29	2.19	11,888.74	6,294.93 N	1,002.55 W	510,809.33	725,518.75	2.37	6,364.09	60.14	
18,768.00	91.32	2.23	11,888.69	6,296.93 N	1,002.48 W	510,811.33	725,518.82	2.37	6,366.07	60.14	
18,770.00	91.32	2.24	11,888.65	6,298.92 N	1,002.40 W	510,813.32	725,518.90	0.47	6,368.05	89.10	
18,772.00	91.30	2.22	11,888.60	6,300.92 N	1,002.32 W	510,815.32	725,518.98	1.62	6,370.03	-136.05	
18,774.00	91.27	2.19	11,888.56	6,302.92 N	1,002.24 W	510,817.32	725,519.06	1.62	6,372.01	-136.05	
18,776.00	91.25	2.17	11,888.51	6,304.92 N	1,002.17 W	510,819.32	725,519.13	1.62	6,373.99	-136.05	
18,778.00	91.23	2.15	11,888.47	6,306.92 N	1,002.09 W	510,821.32	725,519.21	1.62	6,375.97	-136.05	
18,780.00	91.20	2.13	11,888.43	6,308.91 N	1,002.02 W	510,823.31	725,519.28	1.62	6,377.95	-136.05	
18,782.00	91.18	2.10	11,888.39	6,310.91 N	1,001.94 W	510,825.31	725,519.36	1.62	6,379.93	-136.05	
18,784.00	91.16	2.08	11,888.35	6,312.91 N	1,001.87 W	510,827.31	725,519.43	1.62	6,381.91	-136.06	
18,786.00	91.13	2.06	11,888.31	6,314.91 N	1,001.80 W	510,829.31	725,519.50	1.62	6,383.89	-136.06	
18,788.00	91.11	2.04	11,888.27	6,316.91 N	1,001.73 W	510,831.31	725,519.57	1.62	6,385.87	-136.06	
18,790.00	91.09	2.01	11,888.23	6,318.91 N	1,001.66 W	510,833.31	725,519.64	1.62	6,387.86	-136.06	
18,792.00	91.06	1.99	11,888.19	6,320.90 N	1,001.59 W	510,835.30	725,519.71	1.62	6,389.84	-136.06	
18,794.00	91.04	1.97	11,888.16	6,322.90 N	1,001.52 W	510,837.30	725,519.78	1.62	6,391.82	-136.06	
18,796.00	91.02	1.95	11,888.12	6,324.90 N	1,001.45 W	510,839.30	725,519.85	1.62	6,393.80	-136.06	
18,798.00	90.99	1.92	11,888.08	6,326.90 N	1,001.38 W	510,841.30	725,519.92	1.62	6,395.78	-136.06	
18,800.00	90.97	1.90	11,888.05	6,328.90 N	1,001.31 W	510,843.30	725,519.99	1.62	6,397.76	-136.06	
18,802.00	90.95	1.88	11,888.02	6,330.90 N	1,001.25 W	510,845.30	725,520.05	1.62	6,399.74	-136.06	
18,804.00	90.92	1.86	11,887.98	6,332.90 N	1,001.18 W	510,847.30	725,520.12	1.62	6,401.73	-136.06	
18,806.00	90.90	1.83	11,887.95	6,334.89 N	1,001.12 W	510,849.29	725,520.18	1.62	6,403.71	-136.06	
18,808.00	90.88	1.81	11,887.92	6,336.89 N	1,001.05 W	510,851.29	725,520.25	1.62	6,405.69	-136.06	
18,810.00	90.85	1.79	11,887.89	6,338.89 N	1,000.99 W	510,853.29	725,520.31	1.62	6,407.67	-136.06	
18,812.00	90.83	1.77	11,887.86	6,340.89 N	1,000.93 W	510,855.29	725,520.37	1.62	6,409.65	-136.06	
18,814.00	90.81	1.75	11,887.83	6,342.89 N	1,000.87 W	510,857.29	725,520.43	1.62	6,411.64	-136.06	
18,816.00	90.78	1.72	11,887.81	6,344.89 N	1,000.81 W	510,859.29	725,520.49	1.62	6,413.62	-136.06	
18,818.00	90.76	1.70	11,887.78	6,346.89 N	1,000.75 W	510,861.29	725,520.55	1.62	6,415.60	-136.06	
18,820.00	90.74	1.68	11,887.75	6,348.89 N	1,000.69 W	510,863.29	725,520.61	1.62	6,417.58	-136.06	
18,822.00	90.71	1.66	11,887.73	6,350.89 N	1,000.63 W	510,865.29	725,520.67	1.62	6,419.57	-136.06	
18,824.00	90.69	1.63	11,887.70	6,352.88 N	1,000.57 W	510,867.28	725,520.73	1.62	6,421.55	-136.06	
18,826.00	90.67	1.61	11,887.68	6,354.88 N	1,000.52 W	510,869.28	725,520.78	1.62	6,423.53	-136.06	
18,828.00	90.64	1.59	11,887.66	6,356.88 N	1,000.46 W	510,871.28	725,520.84	1.62	6,425.52	-136.06	
18,830.00	90.62	1.57	11,887.63	6,358.88 N	1,000.41 W	510,873.28	725,520.89	1.62	6,427.50	-136.06	
18,832.00	90.60	1.54	11,887.61	6,360.88 N	1,000.35 W	510,875.28	725,520.95	1.62	6,429.48	-136.06	
18,834.00	90.57	1.52	11,887.59	6,362.88 N	1,000.30 W	510,877.28	725,521.00	1.62	6,431.47	-136.06	
18,836.00	90.55	1.50	11,887.57	6,364.88 N	1,000.25 W	510,879.28	725,521.05	1.62	6,433.45	-136.06	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates (usft)		Map Coordinates (usft)		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing	Easting	Northing	Easting				
18,838.00	90.53	1.48	11,887.55	6,366.88 N	1,000.19 W	510,881.28	725,521.11	1.62	6,435.43	-136.06	
18,840.00	90.50	1.45	11,887.54	6,368.88 N	1,000.14 W	510,883.28	725,521.16	1.62	6,437.42	-136.06	
18,842.00	90.48	1.43	11,887.52	6,370.88 N	1,000.09 W	510,885.28	725,521.21	1.62	6,439.40	-136.06	
18,844.00	90.46	1.41	11,887.50	6,372.88 N	1,000.04 W	510,887.28	725,521.26	1.62	6,441.39	-136.06	
18,846.00	90.43	1.39	11,887.49	6,374.88 N	999.99 W	510,889.28	725,521.31	1.62	6,443.37	-136.06	
18,848.00	90.41	1.36	11,887.47	6,376.87 N	999.95 W	510,891.27	725,521.35	1.62	6,445.35	-136.07	
18,850.00	90.39	1.34	11,887.46	6,378.87 N	999.90 W	510,893.27	725,521.40	1.62	6,447.34	-136.07	
18,852.00	90.36	1.32	11,887.44	6,380.87 N	999.85 W	510,895.27	725,521.45	1.62	6,449.32	-136.07	
18,854.00	90.34	1.30	11,887.43	6,382.87 N	999.81 W	510,897.27	725,521.49	1.62	6,451.31	-136.07	
18,856.00	90.32	1.27	11,887.42	6,384.87 N	999.76 W	510,899.27	725,521.54	1.62	6,453.29	-136.07	
18,858.00	90.29	1.25	11,887.41	6,386.87 N	999.72 W	510,901.27	725,521.58	1.62	6,455.28	-136.07	
18,860.00	90.27	1.23	11,887.40	6,388.87 N	999.67 W	510,903.27	725,521.63	1.62	6,457.26	-136.07	
18,862.00	90.25	1.21	11,887.39	6,390.87 N	999.63 W	510,905.27	725,521.67	1.62	6,459.25	-136.07	
18,864.00	90.22	1.18	11,887.38	6,392.87 N	999.59 W	510,907.27	725,521.71	1.62	6,461.23	-136.07	
18,866.00	90.20	1.16	11,887.38	6,394.87 N	999.55 W	510,909.27	725,521.75	1.62	6,463.22	-136.07	
18,868.00	90.18	1.14	11,887.37	6,396.87 N	999.51 W	510,911.27	725,521.79	1.62	6,465.20	-136.07	
18,870.00	90.15	1.12	11,887.36	6,398.87 N	999.47 W	510,913.27	725,521.83	1.62	6,467.19	-136.07	
18,872.00	90.13	1.09	11,887.36	6,400.87 N	999.43 W	510,915.27	725,521.87	1.62	6,469.17	-136.07	
18,874.00	90.11	1.07	11,887.35	6,402.87 N	999.39 W	510,917.27	725,521.91	1.62	6,471.16	-136.07	
18,876.00	90.08	1.05	11,887.35	6,404.87 N	999.36 W	510,919.27	725,521.94	1.62	6,473.14	-136.07	
18,878.00	90.06	1.03	11,887.35	6,406.87 N	999.32 W	510,921.27	725,521.98	1.62	6,475.13	-136.07	
18,880.00	90.04	1.00	11,887.35	6,408.87 N	999.28 W	510,923.27	725,522.02	1.62	6,477.12	-136.07	
18,882.00	90.01	0.98	11,887.35	6,410.87 N	999.25 W	510,925.27	725,522.05	1.62	6,479.10	-136.07	
18,884.00	89.99	0.96	11,887.35	6,412.87 N	999.22 W	510,927.27	725,522.08	1.62	6,481.09	-136.07	
18,886.00	89.97	0.94	11,887.35	6,414.87 N	999.18 W	510,929.27	725,522.12	1.62	6,483.07	-136.07	
18,888.00	89.94	0.92	11,887.35	6,416.87 N	999.15 W	510,931.27	725,522.15	1.62	6,485.06	-136.07	
18,890.00	89.92	0.89	11,887.35	6,418.87 N	999.12 W	510,933.27	725,522.18	1.62	6,487.05	-136.07	
18,892.00	89.90	0.87	11,887.35	6,420.87 N	999.09 W	510,935.27	725,522.21	1.62	6,489.03	-136.07	
18,894.00	89.87	0.85	11,887.36	6,422.87 N	999.06 W	510,937.27	725,522.24	1.62	6,491.02	-136.07	
18,896.00	89.85	0.83	11,887.36	6,424.87 N	999.03 W	510,939.27	725,522.27	1.62	6,493.00	-136.07	
18,898.00	89.83	0.80	11,887.37	6,426.87 N	999.00 W	510,941.27	725,522.30	1.62	6,494.99	-136.07	
18,900.00	89.81	0.78	11,887.37	6,428.87 N	998.97 W	510,943.27	725,522.33	1.62	6,496.98	-136.07	
18,902.00	89.78	0.76	11,887.38	6,430.86 N	998.95 W	510,945.26	725,522.35	1.62	6,498.97	-136.07	
18,904.00	89.76	0.74	11,887.39	6,432.86 N	998.92 W	510,947.26	725,522.38	1.62	6,500.95	-136.07	
18,906.00	89.74	0.71	11,887.40	6,434.86 N	998.90 W	510,949.26	725,522.40	1.62	6,502.94	-136.07	
18,908.00	89.71	0.69	11,887.41	6,436.86 N	998.87 W	510,951.26	725,522.43	1.62	6,504.93	-136.07	
18,910.00	89.69	0.67	11,887.42	6,438.86 N	998.85 W	510,953.26	725,522.45	1.62	6,506.91	-136.07	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
18,912.00	89.67	0.65	11,887.43	6,440.86 N	998.82 W	510,955.26	725,522.48	1.62	6,508.90	-136.07	
18,914.00	89.64	0.62	11,887.44	6,442.86 N	998.80 W	510,957.26	725,522.50	1.62	6,510.89	-136.07	
18,916.00	89.62	0.60	11,887.45	6,444.86 N	998.78 W	510,959.26	725,522.52	1.62	6,512.88	-136.07	
18,918.00	89.60	0.58	11,887.47	6,446.86 N	998.76 W	510,961.26	725,522.54	1.62	6,514.86	-136.07	
18,920.00	89.57	0.56	11,887.48	6,448.86 N	998.74 W	510,963.26	725,522.56	1.62	6,516.85	-136.07	
18,922.00	89.55	0.53	11,887.50	6,450.86 N	998.72 W	510,965.26	725,522.58	1.62	6,518.84	-136.07	
18,924.00	89.53	0.51	11,887.51	6,452.86 N	998.70 W	510,967.26	725,522.60	1.62	6,520.83	-136.07	
18,926.00	89.50	0.49	11,887.53	6,454.86 N	998.69 W	510,969.26	725,522.61	1.62	6,522.81	-136.06	
18,928.00	89.48	0.47	11,887.55	6,456.86 N	998.67 W	510,971.26	725,522.63	1.62	6,524.80	-136.06	
18,930.00	89.46	0.44	11,887.57	6,458.86 N	998.65 W	510,973.26	725,522.65	1.62	6,526.79	-136.06	
18,932.00	89.43	0.42	11,887.59	6,460.86 N	998.64 W	510,975.26	725,522.66	1.62	6,528.78	-136.06	
18,934.00	89.41	0.40	11,887.61	6,462.86 N	998.62 W	510,977.26	725,522.68	1.62	6,530.77	-136.06	
18,936.00	89.39	0.38	11,887.63	6,464.86 N	998.61 W	510,979.26	725,522.69	1.62	6,532.75	-136.06	
18,938.00	89.36	0.35	11,887.65	6,466.86 N	998.60 W	510,981.26	725,522.70	1.62	6,534.74	-136.06	
18,940.00	89.34	0.33	11,887.67	6,468.86 N	998.58 W	510,983.26	725,522.72	1.62	6,536.73	-136.06	
18,942.00	89.32	0.31	11,887.70	6,470.86 N	998.57 W	510,985.26	725,522.73	1.62	6,538.72	-136.06	
18,944.00	89.29	0.29	11,887.72	6,472.86 N	998.56 W	510,987.26	725,522.74	1.62	6,540.71	-136.06	
18,946.00	89.27	0.26	11,887.75	6,474.86 N	998.55 W	510,989.26	725,522.75	1.62	6,542.70	-136.06	
18,948.00	89.25	0.24	11,887.77	6,476.86 N	998.54 W	510,991.26	725,522.76	1.62	6,544.68	-136.06	
18,950.00	89.22	0.22	11,887.80	6,478.86 N	998.54 W	510,993.26	725,522.76	1.62	6,546.67	-136.06	
18,952.00	89.20	0.20	11,887.83	6,480.86 N	998.53 W	510,995.26	725,522.77	1.62	6,548.66	-136.06	
18,954.00	89.18	0.17	11,887.85	6,482.86 N	998.52 W	510,997.26	725,522.78	1.62	6,550.65	-136.06	
18,956.00	89.15	0.15	11,887.88	6,484.86 N	998.52 W	510,999.26	725,522.78	1.62	6,552.64	-136.06	
18,958.00	89.13	0.13	11,887.91	6,486.86 N	998.51 W	511,001.26	725,522.79	1.62	6,554.63	-136.06	
18,960.00	89.14	0.12	11,887.94	6,488.86 N	998.51 W	511,003.26	725,522.79	0.75	6,556.62	-40.96	
18,962.00	89.15	0.11	11,887.97	6,490.86 N	998.50 W	511,005.26	725,522.80	0.75	6,558.61	-40.96	
18,964.00	89.16	0.10	11,888.00	6,492.86 N	998.50 W	511,007.26	725,522.80	0.75	6,560.60	-40.96	
18,966.00	89.18	0.09	11,888.03	6,494.86 N	998.50 W	511,009.26	725,522.80	0.75	6,562.58	-40.96	
18,968.00	89.19	0.08	11,888.06	6,496.86 N	998.49 W	511,011.26	725,522.81	0.75	6,564.57	-40.96	
18,970.00	89.20	0.07	11,888.09	6,498.86 N	998.49 W	511,013.26	725,522.81	0.75	6,566.56	-40.96	
18,972.00	89.21	0.06	11,888.12	6,500.86 N	998.49 W	511,015.26	725,522.81	0.75	6,568.55	-40.96	
18,974.00	89.22	0.05	11,888.14	6,502.86 N	998.49 W	511,017.26	725,522.81	0.75	6,570.54	-40.96	
18,976.00	89.23	0.04	11,888.17	6,504.86 N	998.49 W	511,019.26	725,522.81	0.75	6,572.53	-40.96	
18,978.00	89.24	0.03	11,888.20	6,506.86 N	998.48 W	511,021.26	725,522.82	0.75	6,574.52	-40.96	
18,980.00	89.25	0.02	11,888.22	6,508.86 N	998.48 W	511,023.26	725,522.82	0.75	6,576.51	-40.96	
18,982.00	89.27	0.01	11,888.25	6,510.86 N	998.48 W	511,025.26	725,522.82	0.75	6,578.50	-40.96	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
18,984.00	89.28	0.00	11,888.27	6,512.86 N	998.48 W	511,027.26	725,522.82	0.75	6,580.49	-40.95	
18,986.00	89.29	359.99	11,888.30	6,514.86 N	998.48 W	511,029.26	725,522.82	0.75	6,582.48	-40.95	
18,988.00	89.30	359.98	11,888.32	6,516.86 N	998.48 W	511,031.26	725,522.82	0.75	6,584.47	-40.95	
18,990.00	89.31	359.97	11,888.35	6,518.86 N	998.48 W	511,033.26	725,522.82	0.75	6,586.46	-40.95	
18,992.00	89.32	359.96	11,888.37	6,520.86 N	998.48 W	511,035.26	725,522.82	0.75	6,588.45	-40.95	
18,994.00	89.33	359.95	11,888.40	6,522.86 N	998.49 W	511,037.26	725,522.81	0.75	6,590.44	-40.95	
18,996.00	89.34	359.94	11,888.42	6,524.86 N	998.49 W	511,039.26	725,522.81	0.75	6,592.43	-40.95	
18,998.00	89.36	359.93	11,888.44	6,526.86 N	998.49 W	511,041.26	725,522.81	0.75	6,594.42	-40.95	
19,000.00	89.37	359.92	11,888.46	6,528.86 N	998.49 W	511,043.26	725,522.81	0.75	6,596.41	-40.95	
19,002.00	89.38	359.91	11,888.49	6,530.86 N	998.50 W	511,045.26	725,522.80	0.75	6,598.40	-40.95	
19,004.00	89.39	359.90	11,888.51	6,532.86 N	998.50 W	511,047.26	725,522.80	0.75	6,600.39	-40.95	
19,006.00	89.40	359.90	11,888.53	6,534.86 N	998.50 W	511,049.26	725,522.80	0.75	6,602.38	-40.95	
19,008.00	89.41	359.89	11,888.55	6,536.86 N	998.51 W	511,051.26	725,522.79	0.75	6,604.37	-40.95	
19,010.00	89.42	359.88	11,888.57	6,538.86 N	998.51 W	511,053.26	725,522.79	0.75	6,606.36	-40.95	
19,012.00	89.43	359.87	11,888.59	6,540.86 N	998.51 W	511,055.26	725,522.79	0.75	6,608.35	-40.95	
19,014.00	89.45	359.86	11,888.61	6,542.86 N	998.52 W	511,057.26	725,522.78	0.75	6,610.34	-40.95	
19,016.00	89.46	359.85	11,888.63	6,544.86 N	998.52 W	511,059.26	725,522.78	0.75	6,612.33	-40.95	
19,018.00	89.47	359.84	11,888.65	6,546.86 N	998.53 W	511,061.26	725,522.77	0.75	6,614.32	-40.95	
19,020.00	89.48	359.83	11,888.67	6,548.86 N	998.54 W	511,063.26	725,522.76	0.75	6,616.31	-40.95	
19,022.00	89.49	359.82	11,888.68	6,550.86 N	998.54 W	511,065.26	725,522.76	0.75	6,618.30	-40.95	
19,024.00	89.50	359.81	11,888.70	6,552.86 N	998.55 W	511,067.26	725,522.75	0.75	6,620.29	-40.95	
19,026.00	89.51	359.80	11,888.72	6,554.86 N	998.56 W	511,069.26	725,522.74	0.75	6,622.28	-40.95	
19,028.00	89.52	359.79	11,888.73	6,556.86 N	998.56 W	511,071.26	725,522.74	0.75	6,624.27	-40.95	
19,030.00	89.54	359.78	11,888.75	6,558.86 N	998.57 W	511,073.26	725,522.73	0.75	6,626.26	-40.95	
19,032.00	89.55	359.77	11,888.77	6,560.85 N	998.58 W	511,075.25	725,522.72	0.75	6,628.25	-40.95	
19,034.00	89.56	359.76	11,888.78	6,562.85 N	998.59 W	511,077.25	725,522.71	0.75	6,630.24	-40.95	
19,036.00	89.57	359.75	11,888.80	6,564.85 N	998.60 W	511,079.25	725,522.70	0.75	6,632.23	-40.95	
19,038.00	89.58	359.74	11,888.81	6,566.85 N	998.60 W	511,081.25	725,522.70	0.75	6,634.22	-40.95	
19,040.00	89.59	359.73	11,888.83	6,568.85 N	998.61 W	511,083.25	725,522.69	0.75	6,636.21	-40.95	
19,042.00	89.60	359.72	11,888.84	6,570.85 N	998.62 W	511,085.25	725,522.68	0.75	6,638.20	-40.95	
19,044.00	89.61	359.71	11,888.86	6,572.85 N	998.63 W	511,087.25	725,522.67	0.75	6,640.19	-40.95	
19,046.00	89.63	359.70	11,888.87	6,574.85 N	998.64 W	511,089.25	725,522.66	0.75	6,642.18	-40.95	
19,048.00	89.64	359.69	11,888.88	6,576.85 N	998.65 W	511,091.25	725,522.65	0.75	6,644.17	-40.95	
19,050.00	89.65	359.68	11,888.89	6,578.85 N	998.67 W	511,093.25	725,522.63	0.75	6,646.17	-40.95	
19,052.00	89.66	359.67	11,888.91	6,580.85 N	998.68 W	511,095.25	725,522.62	0.75	6,648.16	-40.95	
19,054.00	89.69	359.69	11,888.92	6,582.85 N	998.69 W	511,097.25	725,522.61	1.83	6,650.15	28.92	
19,056.00	89.72	359.71	11,888.93	6,584.85 N	998.70 W	511,099.25	725,522.60	1.83	6,652.14	28.92	



Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
19,058.00	89.76	359.72	11,888.94	6,586.85 N	998.71 W	511,101.25	725,522.59	1.83	6,654.13	28.92	
19,060.00	89.79	359.74	11,888.94	6,588.85 N	998.72 W	511,103.25	725,522.58	1.83	6,656.12	28.92	
19,062.00	89.82	359.76	11,888.95	6,590.85 N	998.73 W	511,105.25	725,522.57	1.83	6,658.11	28.92	
19,064.00	89.85	359.78	11,888.96	6,592.85 N	998.73 W	511,107.25	725,522.57	1.83	6,660.10	28.92	
19,066.00	89.88	359.79	11,888.96	6,594.85 N	998.74 W	511,109.25	725,522.56	1.83	6,662.09	28.92	
19,068.00	89.92	359.81	11,888.96	6,596.85 N	998.75 W	511,111.25	725,522.55	1.83	6,664.08	28.92	
19,070.00	89.95	359.83	11,888.97	6,598.85 N	998.76 W	511,113.25	725,522.54	1.83	6,666.07	28.92	
19,072.00	89.98	359.85	11,888.97	6,600.85 N	998.76 W	511,115.25	725,522.54	1.83	6,668.06	28.92	
19,074.00	90.01	359.86	11,888.97	6,602.85 N	998.77 W	511,117.25	725,522.53	1.83	6,670.05	28.92	
19,076.00	90.04	359.88	11,888.97	6,604.85 N	998.77 W	511,119.25	725,522.53	1.83	6,672.04	28.92	
19,078.00	90.08	359.90	11,888.97	6,606.85 N	998.77 W	511,121.25	725,522.53	1.83	6,674.03	28.92	
19,080.00	90.11	359.92	11,888.96	6,608.85 N	998.78 W	511,123.25	725,522.52	1.83	6,676.02	28.92	
19,082.00	90.14	359.94	11,888.96	6,610.85 N	998.78 W	511,125.25	725,522.52	1.83	6,678.01	28.92	
19,084.00	90.17	359.95	11,888.95	6,612.85 N	998.78 W	511,127.25	725,522.52	1.83	6,680.00	28.92	
19,086.00	90.20	359.97	11,888.95	6,614.85 N	998.78 W	511,129.25	725,522.52	1.83	6,681.99	28.92	
19,088.00	90.24	359.99	11,888.94	6,616.85 N	998.78 W	511,131.25	725,522.52	1.83	6,683.98	28.92	
19,090.00	90.27	0.01	11,888.93	6,618.85 N	998.78 W	511,133.25	725,522.52	1.83	6,685.97	28.92	
19,092.00	90.30	0.02	11,888.92	6,620.85 N	998.78 W	511,135.25	725,522.52	1.83	6,687.96	28.92	
19,094.00	90.33	0.04	11,888.91	6,622.85 N	998.78 W	511,137.25	725,522.52	1.83	6,689.95	28.92	
19,096.00	90.36	0.06	11,888.90	6,624.85 N	998.78 W	511,139.25	725,522.52	1.83	6,691.94	28.92	
19,098.00	90.40	0.08	11,888.88	6,626.85 N	998.78 W	511,141.25	725,522.52	1.83	6,693.93	28.92	
19,100.00	90.43	0.09	11,888.87	6,628.85 N	998.78 W	511,143.25	725,522.52	1.83	6,695.92	28.92	
19,102.00	90.46	0.11	11,888.85	6,630.85 N	998.77 W	511,145.25	725,522.53	1.83	6,697.91	28.92	
19,104.00	90.49	0.13	11,888.84	6,632.85 N	998.77 W	511,147.25	725,522.53	1.83	6,699.90	28.92	
19,106.00	90.52	0.15	11,888.82	6,634.85 N	998.76 W	511,149.25	725,522.54	1.83	6,701.89	28.92	
19,108.00	90.56	0.17	11,888.80	6,636.85 N	998.76 W	511,151.25	725,522.54	1.83	6,703.88	28.92	
19,110.00	90.59	0.18	11,888.78	6,638.85 N	998.75 W	511,153.25	725,522.55	1.83	6,705.86	28.92	
19,112.00	90.62	0.20	11,888.76	6,640.85 N	998.74 W	511,155.25	725,522.56	1.83	6,707.85	28.92	
19,114.00	90.65	0.22	11,888.74	6,642.85 N	998.74 W	511,157.25	725,522.56	1.83	6,709.84	28.93	
19,116.00	90.68	0.24	11,888.71	6,644.85 N	998.73 W	511,159.25	725,522.57	1.83	6,711.83	28.93	
19,118.00	90.72	0.25	11,888.69	6,646.85 N	998.72 W	511,161.25	725,522.58	1.83	6,713.82	28.93	
19,120.00	90.75	0.27	11,888.66	6,648.85 N	998.71 W	511,163.25	725,522.59	1.83	6,715.81	28.93	
19,122.00	90.78	0.29	11,888.64	6,650.85 N	998.70 W	511,165.25	725,522.60	1.83	6,717.80	28.93	
19,124.00	90.81	0.31	11,888.61	6,652.85 N	998.69 W	511,167.25	725,522.61	1.83	6,719.79	28.93	
19,126.00	90.84	0.32	11,888.58	6,654.85 N	998.68 W	511,169.25	725,522.62	1.83	6,721.77	28.93	
19,128.00	90.88	0.34	11,888.55	6,656.85 N	998.67 W	511,171.25	725,522.63	1.83	6,723.76	28.93	
19,130.00	90.91	0.36	11,888.52	6,658.85 N	998.66 W	511,173.25	725,522.64	1.83	6,725.75	28.93	



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Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
19,132.00	90.94	0.38	11,888.49	6,660.85 N	998.64 W	511,175.25	725,522.66	1.83	6,727.74	28.93	
19,134.00	90.97	0.40	11,888.45	6,662.85 N	998.63 W	511,177.25	725,522.67	1.83	6,729.73	28.93	
19,136.00	91.00	0.41	11,888.42	6,664.85 N	998.62 W	511,179.25	725,522.68	1.83	6,731.71	28.93	
19,138.00	91.04	0.43	11,888.38	6,666.85 N	998.60 W	511,181.25	725,522.70	1.83	6,733.70	28.93	
19,140.00	91.07	0.45	11,888.35	6,668.85 N	998.59 W	511,183.25	725,522.71	1.83	6,735.69	28.93	
19,142.00	91.10	0.47	11,888.31	6,670.85 N	998.57 W	511,185.25	725,522.73	1.83	6,737.68	28.93	
19,144.00	91.13	0.48	11,888.27	6,672.85 N	998.55 W	511,187.25	725,522.75	1.83	6,739.67	28.93	
19,146.00	91.16	0.50	11,888.23	6,674.85 N	998.54 W	511,189.25	725,522.76	1.83	6,741.65	28.93	
19,148.00	91.17	0.52	11,888.19	6,676.85 N	998.52 W	511,191.25	725,522.78	0.77	6,743.64	69.58	
19,150.00	91.15	0.53	11,888.15	6,678.85 N	998.50 W	511,193.25	725,522.80	1.20	6,745.63	152.31	
19,152.00	91.13	0.54	11,888.11	6,680.85 N	998.48 W	511,195.25	725,522.82	1.20	6,747.61	152.31	
19,154.00	91.11	0.55	11,888.07	6,682.85 N	998.46 W	511,197.25	725,522.84	1.20	6,749.60	152.31	
19,156.00	91.08	0.56	11,888.03	6,684.85 N	998.44 W	511,199.25	725,522.86	1.20	6,751.59	152.31	
19,158.00	91.06	0.57	11,887.99	6,686.85 N	998.42 W	511,201.25	725,522.88	1.20	6,753.58	152.31	
19,160.00	91.04	0.58	11,887.96	6,688.84 N	998.40 W	511,203.24	725,522.90	1.20	6,755.56	152.31	
19,162.00	91.02	0.59	11,887.92	6,690.84 N	998.38 W	511,205.24	725,522.92	1.20	6,757.55	152.31	
19,164.00	91.00	0.60	11,887.89	6,692.84 N	998.36 W	511,207.24	725,522.94	1.20	6,759.54	152.31	
19,166.00	90.98	0.62	11,887.85	6,694.84 N	998.34 W	511,209.24	725,522.96	1.20	6,761.53	152.31	
19,168.00	90.96	0.63	11,887.82	6,696.84 N	998.32 W	511,211.24	725,522.98	1.20	6,763.51	152.31	
19,170.00	90.94	0.64	11,887.78	6,698.84 N	998.30 W	511,213.24	725,523.00	1.20	6,765.50	152.31	
19,172.00	90.91	0.65	11,887.75	6,700.84 N	998.27 W	511,215.24	725,523.03	1.20	6,767.49	152.31	
19,174.00	90.89	0.66	11,887.72	6,702.84 N	998.25 W	511,217.24	725,523.05	1.20	6,769.47	152.31	
19,176.00	90.87	0.67	11,887.69	6,704.84 N	998.23 W	511,219.24	725,523.07	1.20	6,771.46	152.31	
19,178.00	90.85	0.68	11,887.66	6,706.84 N	998.20 W	511,221.24	725,523.10	1.20	6,773.45	152.31	
19,180.00	90.83	0.69	11,887.63	6,708.84 N	998.18 W	511,223.24	725,523.12	1.20	6,775.43	152.31	
19,182.00	90.81	0.71	11,887.60	6,710.84 N	998.16 W	511,225.24	725,523.14	1.20	6,777.42	152.31	
19,184.00	90.79	0.72	11,887.57	6,712.84 N	998.13 W	511,227.24	725,523.17	1.20	6,779.41	152.31	
19,186.00	90.77	0.73	11,887.55	6,714.84 N	998.11 W	511,229.24	725,523.19	1.20	6,781.40	152.31	
19,188.00	90.74	0.74	11,887.52	6,716.84 N	998.08 W	511,231.24	725,523.22	1.20	6,783.38	152.31	
19,190.00	90.72	0.75	11,887.50	6,718.84 N	998.05 W	511,233.24	725,523.25	1.20	6,785.37	152.31	
19,192.00	90.70	0.76	11,887.47	6,720.84 N	998.03 W	511,235.24	725,523.27	1.20	6,787.36	152.31	
19,194.00	90.68	0.77	11,887.45	6,722.84 N	998.00 W	511,237.24	725,523.30	1.20	6,789.34	152.31	
19,196.00	90.66	0.78	11,887.42	6,724.84 N	997.97 W	511,239.24	725,523.33	1.20	6,791.33	152.31	
19,198.00	90.64	0.79	11,887.40	6,726.84 N	997.95 W	511,241.24	725,523.35	1.20	6,793.32	152.31	
19,200.00	90.62	0.81	11,887.38	6,728.84 N	997.92 W	511,243.24	725,523.38	1.20	6,795.30	152.31	
19,202.00	90.60	0.82	11,887.36	6,730.84 N	997.89 W	511,245.24	725,523.41	1.20	6,797.29	152.31	

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Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
19,204.00	90.57	0.83	11,887.34	6,732.84 N	997.86 W	511,247.24	725,523.44	1.20	6,799.28	152.31	
19,206.00	90.55	0.84	11,887.32	6,734.84 N	997.83 W	511,249.24	725,523.47	1.20	6,801.26	152.31	
19,208.00	90.53	0.85	11,887.30	6,736.84 N	997.80 W	511,251.24	725,523.50	1.20	6,803.25	152.31	
19,210.00	90.51	0.86	11,887.28	6,738.84 N	997.77 W	511,253.24	725,523.53	1.20	6,805.23	152.31	
19,212.00	90.49	0.87	11,887.26	6,740.84 N	997.74 W	511,255.24	725,523.56	1.20	6,807.22	152.31	
19,214.00	90.47	0.88	11,887.25	6,742.84 N	997.71 W	511,257.24	725,523.59	1.20	6,809.21	152.31	
19,216.00	90.45	0.89	11,887.23	6,744.84 N	997.68 W	511,259.24	725,523.62	1.20	6,811.19	152.32	
19,218.00	90.43	0.91	11,887.21	6,746.83 N	997.65 W	511,261.23	725,523.65	1.20	6,813.18	152.32	
19,220.00	90.40	0.92	11,887.20	6,748.83 N	997.62 W	511,263.23	725,523.68	1.20	6,815.17	152.32	
19,222.00	90.38	0.93	11,887.19	6,750.83 N	997.59 W	511,265.23	725,523.71	1.20	6,817.15	152.32	
19,224.00	90.36	0.94	11,887.17	6,752.83 N	997.55 W	511,267.23	725,523.75	1.20	6,819.14	152.32	
19,226.00	90.34	0.95	11,887.16	6,754.83 N	997.52 W	511,269.23	725,523.78	1.20	6,821.12	152.32	
19,228.00	90.32	0.96	11,887.15	6,756.83 N	997.49 W	511,271.23	725,523.81	1.20	6,823.11	152.32	
19,230.00	90.30	0.97	11,887.14	6,758.83 N	997.45 W	511,273.23	725,523.85	1.20	6,825.10	152.32	
19,232.00	90.28	0.98	11,887.13	6,760.83 N	997.42 W	511,275.23	725,523.88	1.20	6,827.08	152.32	
19,234.00	90.26	1.00	11,887.12	6,762.83 N	997.38 W	511,277.23	725,523.92	1.20	6,829.07	152.32	
19,236.00	90.23	1.01	11,887.11	6,764.83 N	997.35 W	511,279.23	725,523.95	1.20	6,831.05	152.32	
19,238.00	90.21	1.02	11,887.10	6,766.83 N	997.31 W	511,281.23	725,523.99	1.20	6,833.04	152.32	
19,240.00	90.19	1.03	11,887.10	6,768.83 N	997.28 W	511,283.23	725,524.02	1.20	6,835.03	152.32	
19,242.00	90.17	1.04	11,887.09	6,770.83 N	997.24 W	511,285.23	725,524.06	1.20	6,837.01	152.32	
19,244.00	90.15	1.00	11,887.08	6,772.83 N	997.21 W	511,287.23	725,524.09	2.24	6,839.00	-123.69	
19,246.00	90.12	0.97	11,887.08	6,774.83 N	997.17 W	511,289.23	725,524.13	2.24	6,840.98	-123.69	
19,248.00	90.10	0.93	11,887.08	6,776.83 N	997.14 W	511,291.23	725,524.16	2.24	6,842.97	-123.69	
19,250.00	90.07	0.89	11,887.07	6,778.83 N	997.11 W	511,293.23	725,524.19	2.24	6,844.96	-123.69	
19,252.00	90.05	0.85	11,887.07	6,780.83 N	997.08 W	511,295.23	725,524.22	2.24	6,846.94	-123.70	
19,254.00	90.02	0.82	11,887.07	6,782.83 N	997.05 W	511,297.23	725,524.25	2.24	6,848.93	-123.70	
19,256.00	90.00	0.78	11,887.07	6,784.83 N	997.02 W	511,299.23	725,524.28	2.24	6,850.91	-123.70	
19,258.00	89.97	0.74	11,887.07	6,786.83 N	996.99 W	511,301.23	725,524.31	2.24	6,852.90	-123.70	
19,260.00	89.95	0.70	11,887.07	6,788.83 N	996.97 W	511,303.23	725,524.33	2.24	6,854.89	-123.70	
19,262.00	89.92	0.67	11,887.07	6,790.83 N	996.94 W	511,305.23	725,524.36	2.24	6,856.88	-123.70	
19,264.00	89.90	0.63	11,887.08	6,792.83 N	996.92 W	511,307.23	725,524.38	2.24	6,858.86	-123.69	
19,266.00	89.87	0.59	11,887.08	6,794.83 N	996.90 W	511,309.23	725,524.40	2.24	6,860.85	-123.69	
19,268.00	89.85	0.56	11,887.09	6,796.83 N	996.88 W	511,311.23	725,524.42	2.24	6,862.84	-123.69	
19,270.00	89.82	0.52	11,887.09	6,798.83 N	996.86 W	511,313.23	725,524.44	2.24	6,864.83	-123.69	
19,272.00	89.80	0.48	11,887.10	6,800.83 N	996.84 W	511,315.23	725,524.46	2.24	6,866.81	-123.69	
19,274.00	89.77	0.44	11,887.11	6,802.83 N	996.83 W	511,317.23	725,524.47	2.24	6,868.80	-123.69	
19,276.00	89.75	0.41	11,887.11	6,804.83 N	996.81 W	511,319.23	725,524.49	2.24	6,870.79	-123.69	

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				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
19,278.00	89.72	0.37	11,887.12	6,806.83 N	996.80 W	511,321.23	725,524.50	2.24	6,872.78	-123.69	
19,280.00	89.70	0.33	11,887.13	6,808.83 N	996.79 W	511,323.23	725,524.51	2.24	6,874.77	-123.69	
19,282.00	89.67	0.29	11,887.14	6,810.83 N	996.78 W	511,325.23	725,524.52	2.24	6,876.76	-123.69	
19,284.00	89.65	0.26	11,887.16	6,812.83 N	996.77 W	511,327.23	725,524.53	2.24	6,878.74	-123.69	
19,286.00	89.62	0.22	11,887.17	6,814.83 N	996.76 W	511,329.23	725,524.54	2.24	6,880.73	-123.69	
19,288.00	89.60	0.18	11,887.18	6,816.83 N	996.75 W	511,331.23	725,524.55	2.24	6,882.72	-123.69	
19,290.00	89.57	0.15	11,887.20	6,818.83 N	996.75 W	511,333.23	725,524.55	2.24	6,884.71	-123.69	
19,292.00	89.55	0.11	11,887.21	6,820.83 N	996.74 W	511,335.23	725,524.56	2.24	6,886.70	-123.69	
19,294.00	89.52	0.07	11,887.23	6,822.83 N	996.74 W	511,337.23	725,524.56	2.24	6,888.69	-123.69	
19,296.00	89.50	0.03	11,887.25	6,824.83 N	996.74 W	511,339.23	725,524.56	2.24	6,890.68	-123.69	
19,298.00	89.47	360.00	11,887.26	6,826.83 N	996.74 W	511,341.23	725,524.56	2.24	6,892.67	-123.69	
19,300.00	89.45	359.96	11,887.28	6,828.83 N	996.74 W	511,343.23	725,524.56	2.24	6,894.66	-123.69	
19,302.00	89.42	359.92	11,887.30	6,830.83 N	996.74 W	511,345.23	725,524.56	2.24	6,896.65	-123.69	
19,304.00	89.40	359.88	11,887.32	6,832.83 N	996.74 W	511,347.23	725,524.56	2.24	6,898.64	-123.69	
19,306.00	89.38	359.85	11,887.34	6,834.83 N	996.75 W	511,349.23	725,524.55	2.24	6,900.63	-123.69	
19,308.00	89.35	359.81	11,887.37	6,836.83 N	996.75 W	511,351.23	725,524.55	2.24	6,902.62	-123.69	
19,310.00	89.33	359.77	11,887.39	6,838.83 N	996.76 W	511,353.23	725,524.54	2.24	6,904.61	-123.69	
19,312.00	89.30	359.74	11,887.41	6,840.83 N	996.77 W	511,355.23	725,524.53	2.24	6,906.60	-123.69	
19,314.00	89.28	359.70	11,887.44	6,842.83 N	996.78 W	511,357.23	725,524.52	2.24	6,908.59	-123.69	
19,316.00	89.25	359.66	11,887.46	6,844.83 N	996.79 W	511,359.23	725,524.51	2.24	6,910.58	-123.69	
19,318.00	89.23	359.62	11,887.49	6,846.83 N	996.80 W	511,361.23	725,524.50	2.24	6,912.57	-123.69	
19,320.00	89.20	359.59	11,887.52	6,848.83 N	996.82 W	511,363.23	725,524.48	2.24	6,914.56	-123.69	
19,322.00	89.18	359.55	11,887.55	6,850.83 N	996.83 W	511,365.23	725,524.47	2.24	6,916.55	-123.69	
19,324.00	89.15	359.51	11,887.58	6,852.83 N	996.85 W	511,367.23	725,524.45	2.24	6,918.54	-123.69	
19,326.00	89.13	359.47	11,887.61	6,854.82 N	996.86 W	511,369.22	725,524.44	2.24	6,920.53	-123.69	
19,328.00	89.10	359.44	11,887.64	6,856.82 N	996.88 W	511,371.22	725,524.42	2.24	6,922.53	-123.69	
19,330.00	89.08	359.40	11,887.67	6,858.82 N	996.90 W	511,373.22	725,524.40	2.24	6,924.52	-123.68	
19,332.00	89.05	359.36	11,887.70	6,860.82 N	996.93 W	511,375.22	725,524.37	2.24	6,926.51	-123.68	
19,334.00	89.03	359.33	11,887.73	6,862.82 N	996.95 W	511,377.22	725,524.35	2.24	6,928.50	-123.68	
19,336.00	89.00	359.29	11,887.77	6,864.82 N	996.97 W	511,379.22	725,524.33	2.24	6,930.49	-123.68	
19,338.00	89.00	359.27	11,887.80	6,866.82 N	997.00 W	511,381.22	725,524.30	1.22	6,932.48	-107.18	
19,340.00	89.01	359.26	11,887.84	6,868.82 N	997.02 W	511,383.22	725,524.28	0.70	6,934.48	-41.92	
19,342.00	89.02	359.25	11,887.87	6,870.82 N	997.05 W	511,385.22	725,524.25	0.70	6,936.47	-41.92	
19,344.00	89.03	359.24	11,887.91	6,872.82 N	997.08 W	511,387.22	725,524.22	0.70	6,938.46	-41.92	
19,346.00	89.04	359.23	11,887.94	6,874.82 N	997.10 W	511,389.22	725,524.20	0.70	6,940.45	-41.92	
19,348.00	89.05	359.22	11,887.97	6,876.82 N	997.13 W	511,391.22	725,524.17	0.70	6,942.44	-41.92	
19,350.00	89.06	359.21	11,888.01	6,878.82 N	997.16 W	511,393.22	725,524.14	0.70	6,944.44	-41.92	

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Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
19,352.00	89.07	359.20	11,888.04	6,880.82 N	997.19 W	511,395.22	725,524.11	0.70	6,946.43	-41.92	
19,354.00	89.08	359.19	11,888.07	6,882.82 N	997.21 W	511,397.22	725,524.09	0.70	6,948.42	-41.92	
19,356.00	89.09	359.18	11,888.11	6,884.82 N	997.24 W	511,399.22	725,524.06	0.70	6,950.41	-41.92	
19,358.00	89.10	359.17	11,888.14	6,886.82 N	997.27 W	511,401.22	725,524.03	0.70	6,952.40	-41.92	
19,360.00	89.11	359.16	11,888.17	6,888.82 N	997.30 W	511,403.22	725,524.00	0.70	6,954.40	-41.92	
19,362.00	89.12	359.15	11,888.20	6,890.82 N	997.33 W	511,405.22	725,523.97	0.70	6,956.39	-41.92	
19,364.00	89.13	359.14	11,888.23	6,892.82 N	997.36 W	511,407.22	725,523.94	0.70	6,958.38	-41.92	
19,366.00	89.14	359.13	11,888.26	6,894.82 N	997.39 W	511,409.22	725,523.91	0.70	6,960.37	-41.92	
19,368.00	89.15	359.12	11,888.29	6,896.82 N	997.42 W	511,411.22	725,523.88	0.70	6,962.37	-41.92	
19,370.00	89.16	359.12	11,888.32	6,898.82 N	997.45 W	511,413.22	725,523.85	0.70	6,964.36	-41.92	
19,372.00	89.17	359.11	11,888.35	6,900.81 N	997.48 W	511,415.21	725,523.82	0.70	6,966.35	-41.92	
19,374.00	89.18	359.10	11,888.38	6,902.81 N	997.51 W	511,417.21	725,523.79	0.70	6,968.34	-41.92	
19,376.00	89.19	359.09	11,888.40	6,904.81 N	997.54 W	511,419.21	725,523.76	0.70	6,970.34	-41.92	
19,378.00	89.20	359.08	11,888.43	6,906.81 N	997.58 W	511,421.21	725,523.72	0.70	6,972.33	-41.92	
19,380.00	89.21	359.07	11,888.46	6,908.81 N	997.61 W	511,423.21	725,523.69	0.70	6,974.32	-41.92	
19,382.00	89.22	359.06	11,888.49	6,910.81 N	997.64 W	511,425.21	725,523.66	0.70	6,976.31	-41.92	
19,384.00	89.23	359.05	11,888.51	6,912.81 N	997.67 W	511,427.21	725,523.63	0.70	6,978.31	-41.92	
19,386.00	89.25	359.04	11,888.54	6,914.81 N	997.71 W	511,429.21	725,523.59	0.70	6,980.30	-41.92	
19,388.00	89.26	359.03	11,888.57	6,916.81 N	997.74 W	511,431.21	725,523.56	0.70	6,982.29	-41.92	
19,390.00	89.27	359.02	11,888.59	6,918.81 N	997.78 W	511,433.21	725,523.52	0.70	6,984.28	-41.92	
19,392.00	89.28	359.01	11,888.62	6,920.81 N	997.81 W	511,435.21	725,523.49	0.70	6,986.28	-41.92	
19,394.00	89.29	359.00	11,888.64	6,922.81 N	997.84 W	511,437.21	725,523.46	0.70	6,988.27	-41.92	
19,396.00	89.30	358.99	11,888.67	6,924.81 N	997.88 W	511,439.21	725,523.42	0.70	6,990.26	-41.92	
19,398.00	89.31	358.98	11,888.69	6,926.81 N	997.91 W	511,441.21	725,523.39	0.70	6,992.25	-41.92	
19,400.00	89.32	358.98	11,888.72	6,928.81 N	997.95 W	511,443.21	725,523.35	0.70	6,994.25	-41.92	
19,402.00	89.33	358.97	11,888.74	6,930.81 N	997.99 W	511,445.21	725,523.31	0.70	6,996.24	-41.92	
19,404.00	89.34	358.96	11,888.76	6,932.81 N	998.02 W	511,447.21	725,523.28	0.70	6,998.23	-41.92	
19,406.00	89.35	358.95	11,888.79	6,934.81 N	998.06 W	511,449.21	725,523.24	0.70	7,000.23	-41.92	
19,408.00	89.36	358.94	11,888.81	6,936.81 N	998.10 W	511,451.21	725,523.20	0.70	7,002.22	-41.92	
19,410.00	89.37	358.93	11,888.83	6,938.81 N	998.13 W	511,453.21	725,523.17	0.70	7,004.21	-41.92	
19,412.00	89.38	358.92	11,888.85	6,940.81 N	998.17 W	511,455.21	725,523.13	0.70	7,006.21	-41.92	
19,414.00	89.39	358.91	11,888.87	6,942.81 N	998.21 W	511,457.21	725,523.09	0.70	7,008.20	-41.92	
19,416.00	89.40	358.90	11,888.90	6,944.80 N	998.25 W	511,459.20	725,523.05	0.70	7,010.19	-41.92	
19,418.00	89.41	358.89	11,888.92	6,946.80 N	998.29 W	511,461.20	725,523.01	0.70	7,012.19	-41.92	
19,420.00	89.42	358.88	11,888.94	6,948.80 N	998.32 W	511,463.20	725,522.98	0.70	7,014.18	-41.92	
19,422.00	89.43	358.87	11,888.96	6,950.80 N	998.36 W	511,465.20	725,522.94	0.70	7,016.17	-41.92	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
19,424.00	89.44	358.86	11,888.98	6,952.80 N	998.40 W	511,467.20	725,522.90	0.70	7,018.16	-41.92	
19,426.00	89.45	358.85	11,889.00	6,954.80 N	998.44 W	511,469.20	725,522.86	0.70	7,020.16	-41.92	
19,428.00	89.46	358.84	11,889.01	6,956.80 N	998.48 W	511,471.20	725,522.82	0.70	7,022.15	-41.92	
19,430.00	89.47	358.83	11,889.03	6,958.80 N	998.52 W	511,473.20	725,522.78	0.70	7,024.14	-41.92	
19,432.00	89.49	358.83	11,889.05	6,960.80 N	998.56 W	511,475.20	725,522.74	0.66	7,026.14	-8.85	
19,434.00	89.50	358.84	11,889.07	6,962.80 N	998.60 W	511,477.20	725,522.70	0.82	7,028.13	18.90	
19,436.00	89.52	358.84	11,889.09	6,964.80 N	998.65 W	511,479.20	725,522.65	0.82	7,030.12	18.90	
19,438.00	89.53	358.85	11,889.10	6,966.80 N	998.69 W	511,481.20	725,522.61	0.82	7,032.12	18.90	
19,440.00	89.55	358.85	11,889.12	6,968.80 N	998.73 W	511,483.20	725,522.57	0.82	7,034.11	18.90	
19,442.00	89.57	358.86	11,889.13	6,970.80 N	998.77 W	511,485.20	725,522.53	0.82	7,036.10	18.90	
19,444.00	89.58	358.86	11,889.15	6,972.80 N	998.81 W	511,487.20	725,522.49	0.82	7,038.10	18.90	
19,446.00	89.60	358.87	11,889.16	6,974.80 N	998.84 W	511,489.20	725,522.46	0.82	7,040.09	18.90	
19,448.00	89.61	358.88	11,889.18	6,976.80 N	998.88 W	511,491.20	725,522.42	0.82	7,042.08	18.90	
19,450.00	89.63	358.88	11,889.19	6,978.80 N	998.92 W	511,493.20	725,522.38	0.82	7,044.08	18.90	
19,452.00	89.64	358.89	11,889.20	6,980.80 N	998.96 W	511,495.20	725,522.34	0.82	7,046.07	18.90	
19,454.00	89.66	358.89	11,889.21	6,982.80 N	999.00 W	511,497.20	725,522.30	0.82	7,048.06	18.90	
19,456.00	89.67	358.90	11,889.23	6,984.80 N	999.04 W	511,499.20	725,522.26	0.82	7,050.06	18.90	
19,458.00	89.69	358.90	11,889.24	6,986.79 N	999.08 W	511,501.19	725,522.22	0.82	7,052.05	18.90	
19,460.00	89.71	358.91	11,889.25	6,988.79 N	999.12 W	511,503.19	725,522.18	0.82	7,054.04	18.90	
19,462.00	89.72	358.91	11,889.26	6,990.79 N	999.15 W	511,505.19	725,522.15	0.82	7,056.04	18.90	
19,464.00	89.74	358.92	11,889.27	6,992.79 N	999.19 W	511,507.19	725,522.11	0.82	7,058.03	18.90	
19,466.00	89.75	358.92	11,889.28	6,994.79 N	999.23 W	511,509.19	725,522.07	0.82	7,060.02	18.90	
19,468.00	89.77	358.93	11,889.28	6,996.79 N	999.27 W	511,511.19	725,522.03	0.82	7,062.02	18.90	
19,470.00	89.78	358.93	11,889.29	6,998.79 N	999.30 W	511,513.19	725,522.00	0.82	7,064.01	18.90	
19,472.00	89.80	358.94	11,889.30	7,000.79 N	999.34 W	511,515.19	725,521.96	0.82	7,066.00	18.90	
19,474.00	89.81	358.94	11,889.31	7,002.79 N	999.38 W	511,517.19	725,521.92	0.82	7,068.00	18.90	
19,476.00	89.83	358.95	11,889.31	7,004.79 N	999.42 W	511,519.19	725,521.88	0.82	7,069.99	18.90	
19,478.00	89.84	358.96	11,889.32	7,006.79 N	999.45 W	511,521.19	725,521.85	0.82	7,071.98	18.90	
19,480.00	89.86	358.96	11,889.32	7,008.79 N	999.49 W	511,523.19	725,521.81	0.82	7,073.98	18.90	
19,482.00	89.88	358.97	11,889.33	7,010.79 N	999.52 W	511,525.19	725,521.78	0.82	7,075.97	18.90	
19,484.00	89.89	358.97	11,889.33	7,012.79 N	999.56 W	511,527.19	725,521.74	0.82	7,077.96	18.90	
19,486.00	89.91	358.98	11,889.34	7,014.79 N	999.60 W	511,529.19	725,521.70	0.82	7,079.95	18.90	
19,488.00	89.92	358.98	11,889.34	7,016.79 N	999.63 W	511,531.19	725,521.67	0.82	7,081.95	18.90	
19,490.00	89.94	358.99	11,889.34	7,018.79 N	999.67 W	511,533.19	725,521.63	0.82	7,083.94	18.90	
19,492.00	89.95	358.99	11,889.34	7,020.79 N	999.70 W	511,535.19	725,521.60	0.82	7,085.93	18.90	
19,494.00	89.97	359.00	11,889.34	7,022.79 N	999.74 W	511,537.19	725,521.56	0.82	7,087.93	18.90	
19,496.00	89.98	359.00	11,889.35	7,024.79 N	999.77 W	511,539.19	725,521.53	0.82	7,089.92	18.90	



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Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates (usft)		Map Coordinates (usft)		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing	Easting	Northing	Easting				
19,498.00	90.00	359.01	11,889.35	7,026.79 N	999.81 W	511,541.19	725,521.49	0.82	7,091.91	18.90	
19,500.00	90.02	359.01	11,889.35	7,028.79 N	999.84 W	511,543.19	725,521.46	0.82	7,093.90	18.90	
19,502.00	90.03	359.02	11,889.34	7,030.79 N	999.88 W	511,545.19	725,521.42	0.82	7,095.90	18.90	
19,504.00	90.05	359.02	11,889.34	7,032.79 N	999.91 W	511,547.19	725,521.39	0.82	7,097.89	18.90	
19,506.00	90.06	359.03	11,889.34	7,034.79 N	999.94 W	511,549.19	725,521.36	0.82	7,099.88	18.90	
19,508.00	90.08	359.03	11,889.34	7,036.79 N	999.98 W	511,551.19	725,521.32	0.82	7,101.88	18.90	
19,510.00	90.09	359.04	11,889.34	7,038.79 N	1,000.01 W	511,553.19	725,521.29	0.82	7,103.87	18.90	
19,512.00	90.11	359.05	11,889.33	7,040.79 N	1,000.05 W	511,555.19	725,521.25	0.82	7,105.86	18.90	
19,514.00	90.12	359.05	11,889.33	7,042.79 N	1,000.08 W	511,557.19	725,521.22	0.82	7,107.85	18.90	
19,516.00	90.14	359.06	11,889.32	7,044.79 N	1,000.11 W	511,559.19	725,521.19	0.82	7,109.85	18.90	
19,518.00	90.16	359.06	11,889.32	7,046.79 N	1,000.14 W	511,561.19	725,521.16	0.82	7,111.84	18.90	
19,520.00	90.17	359.07	11,889.31	7,048.78 N	1,000.18 W	511,563.18	725,521.12	0.82	7,113.83	18.90	
19,522.00	90.19	359.07	11,889.31	7,050.78 N	1,000.21 W	511,565.18	725,521.09	0.82	7,115.83	18.90	
19,524.00	90.20	359.08	11,889.30	7,052.78 N	1,000.24 W	511,567.18	725,521.06	0.82	7,117.82	18.90	
19,526.00	90.20	359.09	11,889.29	7,054.78 N	1,000.27 W	511,569.18	725,521.03	0.75	7,119.81	81.95	
19,528.00	90.19	359.12	11,889.29	7,056.78 N	1,000.31 W	511,571.18	725,520.99	1.35	7,121.80	114.86	
19,530.00	90.18	359.14	11,889.28	7,058.78 N	1,000.34 W	511,573.18	725,520.96	1.35	7,123.80	114.86	
19,532.00	90.17	359.17	11,889.27	7,060.78 N	1,000.37 W	511,575.18	725,520.93	1.35	7,125.79	114.86	
19,534.00	90.16	359.19	11,889.27	7,062.78 N	1,000.39 W	511,577.18	725,520.91	1.35	7,127.78	114.86	
19,536.00	90.15	359.21	11,889.26	7,064.78 N	1,000.42 W	511,579.18	725,520.88	1.35	7,129.77	114.86	
19,538.00	90.14	359.24	11,889.26	7,066.78 N	1,000.45 W	511,581.18	725,520.85	1.35	7,131.77	114.86	
19,540.00	90.13	359.26	11,889.25	7,068.78 N	1,000.47 W	511,583.18	725,520.83	1.35	7,133.76	114.86	
19,542.00	90.11	359.29	11,889.25	7,070.78 N	1,000.50 W	511,585.18	725,520.80	1.35	7,135.75	114.86	
19,544.00	90.10	359.31	11,889.24	7,072.78 N	1,000.52 W	511,587.18	725,520.78	1.35	7,137.74	114.86	
19,546.00	90.09	359.34	11,889.24	7,074.78 N	1,000.55 W	511,589.18	725,520.75	1.35	7,139.73	114.86	
19,548.00	90.08	359.36	11,889.24	7,076.78 N	1,000.57 W	511,591.18	725,520.73	1.35	7,141.73	114.86	
19,550.00	90.07	359.39	11,889.24	7,078.78 N	1,000.59 W	511,593.18	725,520.71	1.35	7,143.72	114.86	
19,552.00	90.06	359.41	11,889.23	7,080.78 N	1,000.61 W	511,595.18	725,520.69	1.35	7,145.71	114.86	
19,554.00	90.05	359.43	11,889.23	7,082.78 N	1,000.63 W	511,597.18	725,520.67	1.35	7,147.70	114.86	
19,556.00	90.03	359.46	11,889.23	7,084.78 N	1,000.65 W	511,599.18	725,520.65	1.35	7,149.69	114.86	
19,558.00	90.02	359.48	11,889.23	7,086.78 N	1,000.67 W	511,601.18	725,520.63	1.35	7,151.68	114.86	
19,560.00	90.01	359.51	11,889.23	7,088.78 N	1,000.69 W	511,603.18	725,520.61	1.35	7,153.68	114.86	
19,562.00	90.00	359.53	11,889.23	7,090.78 N	1,000.71 W	511,605.18	725,520.59	1.35	7,155.67	114.86	
19,564.00	89.99	359.56	11,889.23	7,092.78 N	1,000.72 W	511,607.18	725,520.58	1.35	7,157.66	114.86	
19,566.00	89.98	359.58	11,889.23	7,094.78 N	1,000.74 W	511,609.18	725,520.56	1.35	7,159.65	114.86	
19,568.00	89.97	359.61	11,889.23	7,096.78 N	1,000.75 W	511,611.18	725,520.55	1.35	7,161.64	114.86	
19,570.00	89.96	359.63	11,889.23	7,098.78 N	1,000.76 W	511,613.18	725,520.54	1.35	7,163.63	114.86	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
19,572.00	89.94	359.65	11,889.23	7,100.78 N	1,000.78 W	511,615.18	725,520.52	1.35	7,165.62	114.86	
19,574.00	89.93	359.68	11,889.23	7,102.78 N	1,000.79 W	511,617.18	725,520.51	1.35	7,167.61	114.86	
19,576.00	89.92	359.70	11,889.24	7,104.78 N	1,000.80 W	511,619.18	725,520.50	1.35	7,169.60	114.86	
19,578.00	89.91	359.73	11,889.24	7,106.78 N	1,000.81 W	511,621.18	725,520.49	1.35	7,171.60	114.86	
19,580.00	89.90	359.75	11,889.24	7,108.78 N	1,000.82 W	511,623.18	725,520.48	1.35	7,173.59	114.86	
19,582.00	89.89	359.78	11,889.25	7,110.78 N	1,000.83 W	511,625.18	725,520.47	1.35	7,175.58	114.86	
19,584.00	89.88	359.80	11,889.25	7,112.78 N	1,000.83 W	511,627.18	725,520.47	1.35	7,177.57	114.86	
19,586.00	89.86	359.83	11,889.26	7,114.78 N	1,000.84 W	511,629.18	725,520.46	1.35	7,179.56	114.86	
19,588.00	89.85	359.85	11,889.26	7,116.78 N	1,000.85 W	511,631.18	725,520.45	1.35	7,181.55	114.86	
19,590.00	89.84	359.87	11,889.27	7,118.78 N	1,000.85 W	511,633.18	725,520.45	1.35	7,183.54	114.86	
19,592.00	89.83	359.90	11,889.27	7,120.78 N	1,000.86 W	511,635.18	725,520.44	1.35	7,185.53	114.86	
19,594.00	89.82	359.92	11,889.28	7,122.78 N	1,000.86 W	511,637.18	725,520.44	1.35	7,187.52	114.86	
19,596.00	89.81	359.95	11,889.28	7,124.78 N	1,000.86 W	511,639.18	725,520.44	1.35	7,189.51	114.86	
19,598.00	89.80	359.97	11,889.29	7,126.78 N	1,000.86 W	511,641.18	725,520.44	1.35	7,191.50	114.86	
19,600.00	89.79	360.00	11,889.30	7,128.78 N	1,000.86 W	511,643.18	725,520.44	1.35	7,193.49	114.86	
19,602.00	89.77	0.02	11,889.31	7,130.78 N	1,000.86 W	511,645.18	725,520.44	1.35	7,195.48	114.86	
19,604.00	89.76	0.05	11,889.31	7,132.78 N	1,000.86 W	511,647.18	725,520.44	1.35	7,197.47	114.86	
19,606.00	89.75	0.07	11,889.32	7,134.78 N	1,000.86 W	511,649.18	725,520.44	1.35	7,199.46	114.86	
19,608.00	89.74	0.09	11,889.33	7,136.78 N	1,000.86 W	511,651.18	725,520.44	1.35	7,201.45	114.86	
19,610.00	89.73	0.12	11,889.34	7,138.78 N	1,000.85 W	511,653.18	725,520.45	1.35	7,203.43	114.86	
19,612.00	89.72	0.14	11,889.35	7,140.78 N	1,000.85 W	511,655.18	725,520.45	1.35	7,205.42	114.86	
19,614.00	89.71	0.17	11,889.36	7,142.78 N	1,000.84 W	511,657.18	725,520.46	1.35	7,207.41	114.86	
19,616.00	89.69	0.19	11,889.37	7,144.78 N	1,000.84 W	511,659.18	725,520.46	1.35	7,209.40	114.86	
19,618.00	89.68	0.22	11,889.38	7,146.78 N	1,000.83 W	511,661.18	725,520.47	1.35	7,211.39	114.86	
19,620.00	89.67	0.24	11,889.39	7,148.78 N	1,000.82 W	511,663.18	725,520.48	1.35	7,213.38	114.86	
19,622.00	89.66	0.27	11,889.41	7,150.78 N	1,000.81 W	511,665.18	725,520.49	1.35	7,215.37	114.86	
19,624.00	89.65	0.29	11,889.42	7,152.78 N	1,000.80 W	511,667.18	725,520.50	1.35	7,217.36	114.86	
19,626.00	89.64	0.31	11,889.43	7,154.78 N	1,000.79 W	511,669.18	725,520.51	1.35	7,219.35	114.86	
19,628.00	89.63	0.34	11,889.44	7,156.78 N	1,000.78 W	511,671.18	725,520.52	1.35	7,221.33	114.86	
19,630.00	89.62	0.36	11,889.46	7,158.78 N	1,000.77 W	511,673.18	725,520.53	1.35	7,223.32	114.86	
19,632.00	89.60	0.39	11,889.47	7,160.78 N	1,000.76 W	511,675.18	725,520.54	1.35	7,225.31	114.86	
19,634.00	89.59	0.41	11,889.48	7,162.78 N	1,000.74 W	511,677.18	725,520.56	1.35	7,227.30	114.86	
19,636.00	89.58	0.44	11,889.50	7,164.78 N	1,000.73 W	511,679.18	725,520.57	1.35	7,229.29	114.86	
19,638.00	89.57	0.46	11,889.51	7,166.78 N	1,000.71 W	511,681.18	725,520.59	1.35	7,231.28	114.85	
19,640.00	89.56	0.49	11,889.53	7,168.78 N	1,000.69 W	511,683.18	725,520.61	1.35	7,233.26	114.85	
19,642.00	89.55	0.51	11,889.54	7,170.78 N	1,000.68 W	511,685.18	725,520.62	1.35	7,235.25	114.85	



Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
19,644.00	89.54	0.53	11,889.56	7,172.78 N	1,000.66 W	511,687.18	725,520.64	1.35	7,237.24	114.85	
19,646.00	89.52	0.56	11,889.58	7,174.78 N	1,000.64 W	511,689.18	725,520.66	1.35	7,239.23	114.85	
19,648.00	89.51	0.58	11,889.59	7,176.78 N	1,000.62 W	511,691.18	725,520.68	1.35	7,241.21	114.85	
19,650.00	89.50	0.61	11,889.61	7,178.78 N	1,000.60 W	511,693.18	725,520.70	1.35	7,243.20	114.85	
19,652.00	89.49	0.63	11,889.63	7,180.78 N	1,000.58 W	511,695.18	725,520.72	1.35	7,245.19	114.85	
19,654.00	89.48	0.66	11,889.65	7,182.78 N	1,000.55 W	511,697.18	725,520.75	1.35	7,247.18	114.85	
19,656.00	89.47	0.68	11,889.66	7,184.78 N	1,000.53 W	511,699.18	725,520.77	1.35	7,249.16	114.85	
19,658.00	89.46	0.71	11,889.68	7,186.78 N	1,000.51 W	511,701.18	725,520.79	1.35	7,251.15	114.85	
19,660.00	89.45	0.73	11,889.70	7,188.78 N	1,000.48 W	511,703.18	725,520.82	1.35	7,253.14	114.85	
19,662.00	89.43	0.75	11,889.72	7,190.78 N	1,000.46 W	511,705.18	725,520.84	1.35	7,255.12	114.85	
19,664.00	89.42	0.78	11,889.74	7,192.78 N	1,000.43 W	511,707.18	725,520.87	1.35	7,257.11	114.85	
19,666.00	89.41	0.80	11,889.76	7,194.78 N	1,000.40 W	511,709.18	725,520.90	1.35	7,259.10	114.85	
19,668.00	89.40	0.83	11,889.78	7,196.78 N	1,000.37 W	511,711.18	725,520.93	1.35	7,261.08	114.85	
19,670.00	89.39	0.85	11,889.80	7,198.78 N	1,000.34 W	511,713.18	725,520.96	1.35	7,263.07	114.85	
19,672.00	89.38	0.88	11,889.82	7,200.78 N	1,000.31 W	511,715.18	725,520.99	1.35	7,265.06	114.85	
19,674.00	89.37	0.90	11,889.85	7,202.78 N	1,000.28 W	511,717.18	725,521.02	1.35	7,267.04	114.85	
19,676.00	89.36	0.93	11,889.87	7,204.78 N	1,000.25 W	511,719.18	725,521.05	1.35	7,269.03	114.85	
19,678.00	89.34	0.95	11,889.89	7,206.77 N	1,000.22 W	511,721.17	725,521.08	1.35	7,271.02	114.85	
19,680.00	89.33	0.97	11,889.91	7,208.77 N	1,000.18 W	511,723.17	725,521.12	1.35	7,273.00	114.85	
19,682.00	89.32	1.00	11,889.94	7,210.77 N	1,000.15 W	511,725.17	725,521.15	1.35	7,274.99	114.85	
19,684.00	89.31	1.02	11,889.96	7,212.77 N	1,000.11 W	511,727.17	725,521.19	1.35	7,276.97	114.85	
19,686.00	89.30	1.05	11,889.99	7,214.77 N	1,000.08 W	511,729.17	725,521.22	1.35	7,278.96	114.85	
19,688.00	89.29	1.07	11,890.01	7,216.77 N	1,000.04 W	511,731.17	725,521.26	1.35	7,280.94	114.85	
19,690.00	89.28	1.10	11,890.04	7,218.77 N	1,000.00 W	511,733.17	725,521.30	1.35	7,282.93	114.85	
19,692.00	89.26	1.12	11,890.06	7,220.77 N	999.97 W	511,735.17	725,521.33	1.35	7,284.91	114.85	
19,694.00	89.25	1.15	11,890.09	7,222.77 N	999.93 W	511,737.17	725,521.37	1.35	7,286.90	114.85	
19,696.00	89.24	1.17	11,890.11	7,224.77 N	999.89 W	511,739.17	725,521.41	1.35	7,288.88	114.85	
19,698.00	89.23	1.19	11,890.14	7,226.77 N	999.84 W	511,741.17	725,521.46	1.35	7,290.87	114.85	
19,700.00	89.22	1.22	11,890.17	7,228.77 N	999.80 W	511,743.17	725,521.50	1.35	7,292.85	114.85	
19,702.00	89.21	1.24	11,890.20	7,230.77 N	999.76 W	511,745.17	725,521.54	1.35	7,294.84	114.85	
19,704.00	89.20	1.27	11,890.22	7,232.77 N	999.72 W	511,747.17	725,521.58	1.35	7,296.82	114.85	
19,706.00	89.19	1.29	11,890.25	7,234.77 N	999.67 W	511,749.17	725,521.63	1.35	7,298.81	114.85	
19,708.00	89.17	1.32	11,890.28	7,236.77 N	999.62 W	511,751.17	725,521.68	1.35	7,300.79	114.85	
19,710.00	89.16	1.34	11,890.31	7,238.77 N	999.58 W	511,753.17	725,521.72	1.35	7,302.78	114.85	
19,712.00	89.15	1.37	11,890.34	7,240.76 N	999.53 W	511,755.16	725,521.77	1.35	7,304.76	114.84	
19,714.00	89.14	1.39	11,890.37	7,242.76 N	999.48 W	511,757.16	725,521.82	1.35	7,306.74	114.84	
19,716.00	89.12	1.24	11,890.40	7,244.76 N	999.44 W	511,759.16	725,521.86	7.41	7,308.73	-97.74	



Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
19,718.00	89.10	1.10	11,890.43	7,246.76 N	999.40 W	511,761.16	725,521.90	7.41	7,310.71	-97.74	
19,720.00	89.08	0.95	11,890.46	7,248.76 N	999.36 W	511,763.16	725,521.94	7.41	7,312.70	-97.74	
19,722.00	89.06	0.80	11,890.49	7,250.76 N	999.33 W	511,765.16	725,521.97	7.41	7,314.69	-97.74	
19,724.00	89.04	0.66	11,890.53	7,252.76 N	999.30 W	511,767.16	725,522.00	7.41	7,316.67	-97.73	
19,726.00	89.02	0.51	11,890.56	7,254.76 N	999.28 W	511,769.16	725,522.02	7.41	7,318.66	-97.73	
19,728.00	89.00	0.36	11,890.60	7,256.76 N	999.27 W	511,771.16	725,522.03	7.41	7,320.65	-97.73	
19,730.00	88.98	0.21	11,890.63	7,258.76 N	999.26 W	511,773.16	725,522.04	7.41	7,322.64	-97.73	
19,732.00	88.96	0.07	11,890.67	7,260.76 N	999.25 W	511,775.16	725,522.05	7.41	7,324.62	-97.72	
19,734.00	88.94	359.92	11,890.70	7,262.76 N	999.25 W	511,777.16	725,522.05	7.41	7,326.61	-97.72	
19,736.00	88.92	359.77	11,890.74	7,264.76 N	999.26 W	511,779.16	725,522.04	7.41	7,328.60	-97.72	
19,738.00	88.90	359.63	11,890.78	7,266.76 N	999.27 W	511,781.16	725,522.03	7.41	7,330.59	-97.72	
19,740.00	88.88	359.48	11,890.82	7,268.76 N	999.29 W	511,783.16	725,522.01	7.41	7,332.59	-97.71	
19,742.00	88.86	359.33	11,890.86	7,270.76 N	999.31 W	511,785.16	725,521.99	7.41	7,334.58	-97.71	
19,744.00	88.84	359.19	11,890.90	7,272.76 N	999.33 W	511,787.16	725,521.97	7.41	7,336.57	-97.71	
19,746.00	88.82	359.04	11,890.94	7,274.76 N	999.36 W	511,789.16	725,521.94	7.41	7,338.56	-97.70	
19,748.00	88.80	358.89	11,890.98	7,276.76 N	999.40 W	511,791.16	725,521.90	7.41	7,340.55	-97.70	
19,750.00	88.78	358.75	11,891.02	7,278.75 N	999.44 W	511,793.15	725,521.86	7.41	7,342.55	-97.70	
19,752.00	88.76	358.60	11,891.06	7,280.75 N	999.49 W	511,795.15	725,521.81	7.41	7,344.54	-97.70	
19,754.00	88.74	358.45	11,891.11	7,282.75 N	999.54 W	511,797.15	725,521.76	7.41	7,346.53	-97.69	
19,756.00	88.72	358.30	11,891.15	7,284.75 N	999.59 W	511,799.15	725,521.71	7.41	7,348.53	-97.69	
19,758.00	88.70	358.16	11,891.20	7,286.75 N	999.66 W	511,801.15	725,521.64	7.41	7,350.52	-97.69	
19,760.00	88.68	358.01	11,891.24	7,288.75 N	999.72 W	511,803.15	725,521.58	7.41	7,352.52	-97.68	
19,762.00	88.66	357.86	11,891.29	7,290.75 N	999.80 W	511,805.15	725,521.50	7.41	7,354.51	-97.68	
19,764.00	88.64	357.72	11,891.34	7,292.74 N	999.87 W	511,807.14	725,521.43	7.41	7,356.51	-97.68	
19,766.00	88.62	357.57	11,891.38	7,294.74 N	999.95 W	511,809.14	725,521.35	7.41	7,358.50	-97.67	
19,768.00	88.60	357.42	11,891.43	7,296.74 N	1,000.04 W	511,811.14	725,521.26	7.41	7,360.50	-97.67	
19,770.00	88.58	357.28	11,891.48	7,298.74 N	1,000.13 W	511,813.14	725,521.17	7.41	7,362.50	-97.67	
19,772.00	88.56	357.13	11,891.53	7,300.73 N	1,000.23 W	511,815.13	725,521.07	7.41	7,364.49	-97.66	
19,774.00	88.54	356.98	11,891.58	7,302.73 N	1,000.33 W	511,817.13	725,520.97	7.41	7,366.49	-97.66	
19,776.00	88.52	356.84	11,891.63	7,304.73 N	1,000.44 W	511,819.13	725,520.86	7.41	7,368.49	-97.65	
19,778.00	88.50	356.69	11,891.68	7,306.72 N	1,000.56 W	511,821.12	725,520.74	7.41	7,370.48	-97.65	
19,780.00	88.48	356.54	11,891.74	7,308.72 N	1,000.67 W	511,823.12	725,520.63	7.41	7,372.48	-97.65	
19,782.00	88.47	356.39	11,891.79	7,310.71 N	1,000.80 W	511,825.11	725,520.50	7.41	7,374.48	-97.64	
19,784.00	88.45	356.25	11,891.84	7,312.71 N	1,000.93 W	511,827.11	725,520.37	7.41	7,376.48	-97.64	
19,786.00	88.43	356.10	11,891.90	7,314.70 N	1,001.06 W	511,829.10	725,520.24	7.41	7,378.48	-97.64	
19,788.00	88.41	355.95	11,891.95	7,316.70 N	1,001.20 W	511,831.10	725,520.10	7.41	7,380.47	-97.63	
19,790.00	88.39	355.81	11,892.01	7,318.69 N	1,001.34 W	511,833.09	725,519.96	7.41	7,382.47	-97.63	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
19,792.00	88.37	355.66	11,892.07	7,320.69 N	1,001.49 W	511,835.09	725,519.81	7.41	7,384.47	-97.62	
19,794.00	88.35	355.51	11,892.12	7,322.68 N	1,001.64 W	511,837.08	725,519.66	7.41	7,386.47	-97.62	
19,796.00	88.33	355.37	11,892.18	7,324.67 N	1,001.80 W	511,839.07	725,519.50	7.41	7,388.47	-97.61	
19,798.00	88.31	355.22	11,892.24	7,326.67 N	1,001.97 W	511,841.07	725,519.33	7.41	7,390.47	-97.61	
19,800.00	88.29	355.07	11,892.30	7,328.66 N	1,002.14 W	511,843.06	725,519.16	7.41	7,392.47	-97.61	
19,802.00	88.27	354.92	11,892.36	7,330.65 N	1,002.31 W	511,845.05	725,518.99	7.41	7,394.46	-97.60	
19,804.00	88.25	354.78	11,892.42	7,332.64 N	1,002.49 W	511,847.04	725,518.81	7.41	7,396.46	-97.60	
19,806.00	88.23	354.63	11,892.48	7,334.63 N	1,002.67 W	511,849.03	725,518.63	7.41	7,398.46	-97.59	
19,808.00	88.21	354.48	11,892.54	7,336.62 N	1,002.86 W	511,851.02	725,518.44	7.41	7,400.46	-97.59	
19,810.00	88.23	354.45	11,892.61	7,338.61 N	1,003.06 W	511,853.01	725,518.24	1.70	7,402.46	-61.15	
19,812.00	88.28	354.54	11,892.67	7,340.60 N	1,003.25 W	511,855.00	725,518.05	5.09	7,404.46	59.07	
19,814.00	88.33	354.63	11,892.73	7,342.59 N	1,003.44 W	511,856.99	725,517.86	5.09	7,406.46	59.06	
19,816.00	88.38	354.72	11,892.78	7,344.58 N	1,003.62 W	511,858.98	725,517.68	5.09	7,408.46	59.06	
19,818.00	88.44	354.80	11,892.84	7,346.57 N	1,003.81 W	511,860.97	725,517.49	5.09	7,410.46	59.06	
19,820.00	88.49	354.89	11,892.89	7,348.56 N	1,003.99 W	511,862.96	725,517.31	5.09	7,412.46	59.06	
19,822.00	88.54	354.98	11,892.95	7,350.55 N	1,004.16 W	511,864.95	725,517.14	5.09	7,414.45	59.05	
19,824.00	88.59	355.07	11,893.00	7,352.55 N	1,004.34 W	511,866.95	725,516.96	5.09	7,416.45	59.05	
19,826.00	88.65	355.15	11,893.04	7,354.54 N	1,004.51 W	511,868.94	725,516.79	5.09	7,418.45	59.05	
19,828.00	88.70	355.24	11,893.09	7,356.53 N	1,004.67 W	511,870.93	725,516.63	5.09	7,420.45	59.05	
19,830.00	88.75	355.33	11,893.13	7,358.52 N	1,004.84 W	511,872.92	725,516.46	5.09	7,422.45	59.05	
19,832.00	88.80	355.42	11,893.18	7,360.52 N	1,005.00 W	511,874.92	725,516.30	5.09	7,424.45	59.04	
19,834.00	88.85	355.50	11,893.22	7,362.51 N	1,005.16 W	511,876.91	725,516.14	5.09	7,426.45	59.04	
19,836.00	88.91	355.59	11,893.26	7,364.50 N	1,005.31 W	511,878.90	725,515.99	5.09	7,428.45	59.04	
19,838.00	88.96	355.68	11,893.29	7,366.50 N	1,005.46 W	511,880.90	725,515.84	5.09	7,430.45	59.04	
19,840.00	89.01	355.76	11,893.33	7,368.49 N	1,005.61 W	511,882.89	725,515.69	5.09	7,432.45	59.04	
19,842.00	89.06	355.85	11,893.36	7,370.49 N	1,005.76 W	511,884.89	725,515.54	5.09	7,434.45	59.04	
19,844.00	89.12	355.94	11,893.40	7,372.48 N	1,005.90 W	511,886.88	725,515.40	5.09	7,436.44	59.03	
19,846.00	89.17	356.03	11,893.43	7,374.47 N	1,006.04 W	511,888.87	725,515.26	5.09	7,438.44	59.03	
19,848.00	89.22	356.11	11,893.45	7,376.47 N	1,006.18 W	511,890.87	725,515.12	5.09	7,440.44	59.03	
19,850.00	89.27	356.20	11,893.48	7,378.47 N	1,006.31 W	511,892.87	725,514.99	5.09	7,442.44	59.03	
19,852.00	89.33	356.29	11,893.50	7,380.46 N	1,006.45 W	511,894.86	725,514.85	5.09	7,444.44	59.03	
19,854.00	89.38	356.38	11,893.53	7,382.46 N	1,006.57 W	511,896.86	725,514.73	5.09	7,446.44	59.03	
19,856.00	89.43	356.46	11,893.55	7,384.45 N	1,006.70 W	511,898.85	725,514.60	5.09	7,448.44	59.03	
19,858.00	89.48	356.55	11,893.57	7,386.45 N	1,006.82 W	511,900.85	725,514.48	5.09	7,450.43	59.03	
19,860.00	89.54	356.64	11,893.58	7,388.45 N	1,006.94 W	511,902.85	725,514.36	5.09	7,452.43	59.02	
19,862.00	89.59	356.73	11,893.60	7,390.44 N	1,007.05 W	511,904.84	725,514.25	5.09	7,454.43	59.02	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
19,864.00	89.64	356.81	11,893.61	7,392.44 N	1,007.17 W	511,906.84	725,514.13	5.09	7,456.43	59.02	
19,866.00	89.69	356.90	11,893.62	7,394.44 N	1,007.28 W	511,908.84	725,514.02	5.09	7,458.43	59.02	
19,868.00	89.75	356.99	11,893.63	7,396.43 N	1,007.38 W	511,910.83	725,513.92	5.09	7,460.42	59.02	
19,870.00	89.80	357.08	11,893.64	7,398.43 N	1,007.49 W	511,912.83	725,513.81	5.09	7,462.42	59.02	
19,872.00	89.85	357.16	11,893.65	7,400.43 N	1,007.59 W	511,914.83	725,513.71	5.09	7,464.42	59.02	
19,874.00	89.90	357.25	11,893.65	7,402.42 N	1,007.69 W	511,916.82	725,513.61	5.09	7,466.42	59.02	
19,876.00	89.96	357.34	11,893.65	7,404.42 N	1,007.78 W	511,918.82	725,513.52	5.09	7,468.41	59.02	
19,878.00	90.01	357.42	11,893.65	7,406.42 N	1,007.87 W	511,920.82	725,513.43	5.09	7,470.41	59.02	
19,880.00	90.06	357.51	11,893.65	7,408.42 N	1,007.96 W	511,922.82	725,513.34	5.09	7,472.41	59.02	
19,882.00	90.11	357.60	11,893.65	7,410.42 N	1,008.04 W	511,924.82	725,513.26	5.09	7,474.40	59.02	
19,884.00	90.17	357.69	11,893.65	7,412.42 N	1,008.13 W	511,926.82	725,513.17	5.09	7,476.40	59.02	
19,886.00	90.22	357.77	11,893.64	7,414.41 N	1,008.21 W	511,928.81	725,513.09	5.09	7,478.40	59.02	
19,888.00	90.27	357.86	11,893.63	7,416.41 N	1,008.28 W	511,930.81	725,513.02	5.09	7,480.39	59.02	
19,890.00	90.32	357.95	11,893.62	7,418.41 N	1,008.36 W	511,932.81	725,512.94	5.09	7,482.39	59.02	
19,892.00	90.38	358.04	11,893.61	7,420.41 N	1,008.43 W	511,934.81	725,512.87	5.09	7,484.38	59.02	
19,894.00	90.43	358.12	11,893.59	7,422.41 N	1,008.49 W	511,936.81	725,512.81	5.09	7,486.38	59.02	
19,896.00	90.48	358.21	11,893.58	7,424.41 N	1,008.56 W	511,938.81	725,512.74	5.09	7,488.37	59.02	
19,898.00	90.53	358.30	11,893.56	7,426.41 N	1,008.62 W	511,940.81	725,512.68	5.09	7,490.37	59.02	
19,900.00	90.59	358.39	11,893.54	7,428.41 N	1,008.68 W	511,942.81	725,512.62	5.09	7,492.36	59.03	
19,902.00	90.64	358.47	11,893.52	7,430.40 N	1,008.73 W	511,944.80	725,512.57	5.09	7,494.36	59.03	
19,904.00	90.69	358.56	11,893.50	7,432.40 N	1,008.78 W	511,946.80	725,512.52	5.09	7,496.35	59.03	
19,906.00	90.65	358.56	11,893.47	7,434.40 N	1,008.83 W	511,948.80	725,512.47	1.90	7,498.35	-178.72	
19,908.00	90.61	358.56	11,893.45	7,436.40 N	1,008.88 W	511,950.80	725,512.42	1.90	7,500.34	-178.72	
19,910.00	90.58	358.56	11,893.43	7,438.40 N	1,008.93 W	511,952.80	725,512.37	1.90	7,502.33	-178.72	
19,912.00	90.54	358.56	11,893.41	7,440.40 N	1,008.98 W	511,954.80	725,512.32	1.90	7,504.33	-178.72	
19,914.00	90.50	358.56	11,893.39	7,442.40 N	1,009.03 W	511,956.80	725,512.27	1.90	7,506.32	-178.72	
19,916.00	90.46	358.55	11,893.38	7,444.40 N	1,009.08 W	511,958.80	725,512.22	1.90	7,508.32	-178.72	
19,918.00	90.42	358.55	11,893.36	7,446.40 N	1,009.13 W	511,960.80	725,512.17	1.90	7,510.31	-178.72	
19,920.00	90.39	358.55	11,893.35	7,448.40 N	1,009.18 W	511,962.80	725,512.12	1.90	7,512.30	-178.72	
19,922.00	90.35	358.55	11,893.33	7,450.40 N	1,009.24 W	511,964.80	725,512.06	1.90	7,514.30	-178.72	
19,924.00	90.31	358.55	11,893.32	7,452.40 N	1,009.29 W	511,966.80	725,512.01	1.90	7,516.29	-178.72	
19,926.00	90.27	358.55	11,893.31	7,454.40 N	1,009.34 W	511,968.80	725,511.96	1.90	7,518.29	-178.72	
19,928.00	90.23	358.55	11,893.30	7,456.40 N	1,009.39 W	511,970.80	725,511.91	1.90	7,520.28	-178.72	
19,930.00	90.19	358.55	11,893.30	7,458.39 N	1,009.44 W	511,972.79	725,511.86	1.90	7,522.27	-178.72	
19,932.00	90.16	358.55	11,893.29	7,460.39 N	1,009.49 W	511,974.79	725,511.81	1.90	7,524.27	-178.72	
19,934.00	90.12	358.55	11,893.28	7,462.39 N	1,009.54 W	511,976.79	725,511.76	1.90	7,526.26	-178.72	
19,936.00	90.08	358.55	11,893.28	7,464.39 N	1,009.59 W	511,978.79	725,511.71	1.90	7,528.26	-178.72	



Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
19,938.00	90.04	358.55	11,893.28	7,466.39 N	1,009.64 W	511,980.79	725,511.66	1.90	7,530.25	-178.72	
19,940.00	90.00	358.54	11,893.28	7,468.39 N	1,009.69 W	511,982.79	725,511.61	1.90	7,532.25	-178.72	
19,942.00	89.97	358.54	11,893.28	7,470.39 N	1,009.74 W	511,984.79	725,511.56	1.90	7,534.24	-178.72	
19,944.00	89.93	358.54	11,893.28	7,472.39 N	1,009.79 W	511,986.79	725,511.51	1.90	7,536.23	-178.72	
19,946.00	89.89	358.54	11,893.28	7,474.39 N	1,009.84 W	511,988.79	725,511.46	1.90	7,538.23	-178.72	
19,948.00	89.85	358.54	11,893.29	7,476.39 N	1,009.89 W	511,990.79	725,511.41	1.90	7,540.22	-178.72	
19,950.00	89.81	358.54	11,893.29	7,478.39 N	1,009.95 W	511,992.79	725,511.35	1.90	7,542.22	-178.72	
19,952.00	89.78	358.54	11,893.30	7,480.39 N	1,010.00 W	511,994.79	725,511.30	1.90	7,544.21	-178.72	
19,954.00	89.74	358.54	11,893.31	7,482.39 N	1,010.05 W	511,996.79	725,511.25	1.90	7,546.21	-178.72	
19,956.00	89.70	358.54	11,893.32	7,484.39 N	1,010.10 W	511,998.79	725,511.20	1.90	7,548.20	-178.72	
19,958.00	89.66	358.54	11,893.33	7,486.39 N	1,010.15 W	512,000.79	725,511.15	1.90	7,550.19	-178.72	
19,960.00	89.62	358.54	11,893.34	7,488.38 N	1,010.20 W	512,002.78	725,511.10	1.90	7,552.19	-178.72	
19,962.00	89.59	358.54	11,893.36	7,490.38 N	1,010.25 W	512,004.78	725,511.05	1.90	7,554.18	-178.72	
19,964.00	89.55	358.53	11,893.37	7,492.38 N	1,010.30 W	512,006.78	725,511.00	1.90	7,556.18	-178.72	
19,966.00	89.51	358.53	11,893.39	7,494.38 N	1,010.35 W	512,008.78	725,510.95	1.90	7,558.17	-178.72	
19,968.00	89.47	358.53	11,893.41	7,496.38 N	1,010.41 W	512,010.78	725,510.89	1.90	7,560.16	-178.72	
19,970.00	89.43	358.53	11,893.43	7,498.38 N	1,010.46 W	512,012.78	725,510.84	1.90	7,562.16	-178.72	
19,972.00	89.40	358.53	11,893.45	7,500.38 N	1,010.51 W	512,014.78	725,510.79	1.90	7,564.15	-178.72	
19,974.00	89.36	358.53	11,893.47	7,502.38 N	1,010.56 W	512,016.78	725,510.74	1.90	7,566.15	-178.72	
19,976.00	89.32	358.53	11,893.49	7,504.38 N	1,010.61 W	512,018.78	725,510.69	1.90	7,568.14	-178.72	
19,978.00	89.28	358.53	11,893.52	7,506.38 N	1,010.66 W	512,020.78	725,510.64	1.90	7,570.14	-178.72	
19,980.00	89.24	358.53	11,893.54	7,508.38 N	1,010.71 W	512,022.78	725,510.59	1.90	7,572.13	-178.72	
19,982.00	89.20	358.53	11,893.57	7,510.38 N	1,010.76 W	512,024.78	725,510.54	1.90	7,574.12	-178.72	
19,984.00	89.17	358.53	11,893.60	7,512.38 N	1,010.82 W	512,026.78	725,510.48	1.90	7,576.12	-178.72	
19,986.00	89.13	358.53	11,893.63	7,514.37 N	1,010.87 W	512,028.77	725,510.43	1.90	7,578.11	-178.72	
19,988.00	89.09	358.52	11,893.66	7,516.37 N	1,010.92 W	512,030.77	725,510.38	1.90	7,580.11	-178.72	
19,990.00	89.05	358.52	11,893.69	7,518.37 N	1,010.97 W	512,032.77	725,510.33	1.90	7,582.10	-178.72	
19,992.00	89.01	358.52	11,893.72	7,520.37 N	1,011.02 W	512,034.77	725,510.28	1.90	7,584.09	-178.72	
19,994.00	88.98	358.52	11,893.76	7,522.37 N	1,011.07 W	512,036.77	725,510.23	1.90	7,586.09	-178.72	
19,996.00	88.94	358.52	11,893.79	7,524.37 N	1,011.13 W	512,038.77	725,510.17	1.90	7,588.08	-178.72	
19,998.00	88.90	358.52	11,893.83	7,526.37 N	1,011.18 W	512,040.77	725,510.12	1.90	7,590.08	-178.72	
20,000.00	88.92	358.52	11,893.87	7,528.37 N	1,011.23 W	512,042.77	725,510.07	0.78	7,592.07	-10.10	
20,002.00	88.93	358.51	11,893.91	7,530.37 N	1,011.28 W	512,044.77	725,510.02	0.78	7,594.06	-10.10	
20,004.00	88.95	358.51	11,893.95	7,532.37 N	1,011.33 W	512,046.77	725,509.97	0.78	7,596.06	-10.10	
20,006.00	88.96	358.51	11,893.98	7,534.36 N	1,011.38 W	512,048.76	725,509.92	0.78	7,598.05	-10.10	
20,008.00	88.98	358.51	11,894.02	7,536.36 N	1,011.44 W	512,050.76	725,509.86	0.78	7,600.05	-10.10	
20,010.00	88.99	358.50	11,894.05	7,538.36 N	1,011.49 W	512,052.76	725,509.81	0.78	7,602.04	-10.10	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
20,012.00	89.01	358.50	11,894.09	7,540.36 N	1,011.54 W	512,054.76	725,509.76	0.78	7,604.03	-10.10	
20,014.00	89.02	358.50	11,894.12	7,542.36 N	1,011.59 W	512,056.76	725,509.71	0.78	7,606.03	-10.10	
20,016.00	89.04	358.50	11,894.16	7,544.36 N	1,011.65 W	512,058.76	725,509.65	0.78	7,608.02	-10.10	
20,018.00	89.05	358.49	11,894.19	7,546.36 N	1,011.70 W	512,060.76	725,509.60	0.78	7,610.02	-10.10	
20,020.00	89.07	358.49	11,894.22	7,548.36 N	1,011.75 W	512,062.76	725,509.55	0.78	7,612.01	-10.10	
20,022.00	89.08	358.49	11,894.25	7,550.36 N	1,011.80 W	512,064.76	725,509.50	0.78	7,614.00	-10.10	
20,024.00	89.10	358.48	11,894.29	7,552.36 N	1,011.86 W	512,066.76	725,509.44	0.78	7,616.00	-10.10	
20,026.00	89.12	358.48	11,894.32	7,554.35 N	1,011.91 W	512,068.75	725,509.39	0.78	7,617.99	-10.10	
20,028.00	89.13	358.48	11,894.35	7,556.35 N	1,011.96 W	512,070.75	725,509.34	0.78	7,619.99	-10.10	
20,030.00	89.15	358.48	11,894.38	7,558.35 N	1,012.02 W	512,072.75	725,509.28	0.78	7,621.98	-10.10	
20,032.00	89.16	358.47	11,894.41	7,560.35 N	1,012.07 W	512,074.75	725,509.23	0.78	7,623.97	-10.10	
20,034.00	89.18	358.47	11,894.44	7,562.35 N	1,012.12 W	512,076.75	725,509.18	0.78	7,625.97	-10.10	
20,036.00	89.19	358.47	11,894.47	7,564.35 N	1,012.18 W	512,078.75	725,509.12	0.78	7,627.96	-10.10	
20,038.00	89.21	358.47	11,894.49	7,566.35 N	1,012.23 W	512,080.75	725,509.07	0.78	7,629.96	-10.10	
20,040.00	89.22	358.46	11,894.52	7,568.35 N	1,012.28 W	512,082.75	725,509.02	0.78	7,631.95	-10.10	
20,042.00	89.24	358.46	11,894.55	7,570.35 N	1,012.34 W	512,084.75	725,508.96	0.78	7,633.95	-10.10	
20,044.00	89.25	358.46	11,894.57	7,572.35 N	1,012.39 W	512,086.75	725,508.91	0.78	7,635.94	-10.10	
20,046.00	89.27	358.45	11,894.60	7,574.35 N	1,012.44 W	512,088.75	725,508.86	0.78	7,637.93	-10.10	
20,048.00	89.28	358.45	11,894.62	7,576.34 N	1,012.50 W	512,090.74	725,508.80	0.78	7,639.93	-10.10	
20,050.00	89.30	358.45	11,894.65	7,578.34 N	1,012.55 W	512,092.74	725,508.75	0.78	7,641.92	-10.10	
20,052.00	89.31	358.45	11,894.67	7,580.34 N	1,012.61 W	512,094.74	725,508.69	0.78	7,643.92	-10.10	
20,054.00	89.33	358.44	11,894.70	7,582.34 N	1,012.66 W	512,096.74	725,508.64	0.78	7,645.91	-10.10	
20,056.00	89.35	358.44	11,894.72	7,584.34 N	1,012.71 W	512,098.74	725,508.59	0.78	7,647.91	-10.10	
20,058.00	89.36	358.44	11,894.74	7,586.34 N	1,012.77 W	512,100.74	725,508.53	0.78	7,649.90	-10.10	
20,060.00	89.38	358.44	11,894.77	7,588.34 N	1,012.82 W	512,102.74	725,508.48	0.78	7,651.89	-10.10	
20,062.00	89.39	358.43	11,894.79	7,590.34 N	1,012.88 W	512,104.74	725,508.42	0.78	7,653.89	-10.10	
20,064.00	89.41	358.43	11,894.81	7,592.34 N	1,012.93 W	512,106.74	725,508.37	0.78	7,655.88	-10.10	
20,066.00	89.42	358.43	11,894.83	7,594.34 N	1,012.99 W	512,108.74	725,508.31	0.78	7,657.88	-10.10	
20,068.00	89.44	358.42	11,894.85	7,596.34 N	1,013.04 W	512,110.74	725,508.26	0.78	7,659.87	-10.10	
20,070.00	89.45	358.42	11,894.87	7,598.34 N	1,013.10 W	512,112.74	725,508.20	0.78	7,661.87	-10.10	
20,072.00	89.47	358.42	11,894.89	7,600.33 N	1,013.15 W	512,114.73	725,508.15	0.78	7,663.86	-10.10	
20,074.00	89.48	358.42	11,894.90	7,602.33 N	1,013.21 W	512,116.73	725,508.09	0.78	7,665.86	-10.10	
20,076.00	89.50	358.41	11,894.92	7,604.33 N	1,013.26 W	512,118.73	725,508.04	0.78	7,667.85	-10.10	
20,078.00	89.51	358.41	11,894.94	7,606.33 N	1,013.32 W	512,120.73	725,507.98	0.78	7,669.85	-10.10	
20,080.00	89.53	358.41	11,894.96	7,608.33 N	1,013.37 W	512,122.73	725,507.93	0.78	7,671.84	-10.10	
20,082.00	89.55	358.41	11,894.97	7,610.33 N	1,013.43 W	512,124.73	725,507.87	0.78	7,673.83	-10.10	

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Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
20,084.00	89.56	358.40	11,894.99	7,612.33 N	1,013.49 W	512,126.73	725,507.81	0.78	7,675.83	-10.10	
20,086.00	89.58	358.40	11,895.00	7,614.33 N	1,013.54 W	512,128.73	725,507.76	0.78	7,677.82	-10.10	
20,088.00	89.59	358.40	11,895.02	7,616.33 N	1,013.60 W	512,130.73	725,507.70	0.78	7,679.82	-10.10	
20,090.00	89.61	358.39	11,895.03	7,618.33 N	1,013.65 W	512,132.73	725,507.65	0.78	7,681.81	-10.10	
20,092.00	89.62	358.39	11,895.04	7,620.33 N	1,013.71 W	512,134.73	725,507.59	0.78	7,683.81	-10.10	
20,094.00	89.64	358.39	11,895.06	7,622.33 N	1,013.77 W	512,136.73	725,507.53	0.88	7,685.80	-13.12	
20,096.00	89.66	358.38	11,895.07	7,624.32 N	1,013.82 W	512,138.72	725,507.48	0.98	7,687.80	-15.52	
20,098.00	89.68	358.38	11,895.08	7,626.32 N	1,013.88 W	512,140.72	725,507.42	0.98	7,689.79	-15.52	
20,100.00	89.70	358.37	11,895.09	7,628.32 N	1,013.94 W	512,142.72	725,507.36	0.98	7,691.79	-15.52	
20,102.00	89.72	358.37	11,895.10	7,630.32 N	1,013.99 W	512,144.72	725,507.31	0.98	7,693.78	-15.52	
20,104.00	89.73	358.36	11,895.11	7,632.32 N	1,014.05 W	512,146.72	725,507.25	0.98	7,695.77	-15.52	
20,106.00	89.75	358.36	11,895.12	7,634.32 N	1,014.11 W	512,148.72	725,507.19	0.98	7,697.77	-15.52	
20,108.00	89.77	358.35	11,895.13	7,636.32 N	1,014.16 W	512,150.72	725,507.14	0.98	7,699.76	-15.52	
20,110.00	89.79	358.35	11,895.14	7,638.32 N	1,014.22 W	512,152.72	725,507.08	0.98	7,701.76	-15.52	
20,112.00	89.81	358.34	11,895.14	7,640.32 N	1,014.28 W	512,154.72	725,507.02	0.98	7,703.75	-15.52	
20,114.00	89.83	358.33	11,895.15	7,642.32 N	1,014.34 W	512,156.72	725,506.96	0.98	7,705.75	-15.52	
20,116.00	89.85	358.33	11,895.16	7,644.32 N	1,014.40 W	512,158.72	725,506.90	0.98	7,707.74	-15.52	
20,118.00	89.87	358.32	11,895.16	7,646.32 N	1,014.45 W	512,160.72	725,506.85	0.98	7,709.74	-15.52	
20,120.00	89.89	358.32	11,895.17	7,648.31 N	1,014.51 W	512,162.71	725,506.79	0.98	7,711.73	-15.52	
20,122.00	89.90	358.31	11,895.17	7,650.31 N	1,014.57 W	512,164.71	725,506.73	0.98	7,713.73	-15.52	
20,124.00	89.92	358.31	11,895.17	7,652.31 N	1,014.63 W	512,166.71	725,506.67	0.98	7,715.72	-15.52	
20,126.00	89.94	358.30	11,895.17	7,654.31 N	1,014.69 W	512,168.71	725,506.61	0.98	7,717.72	-15.52	
20,128.00	89.96	358.30	11,895.18	7,656.31 N	1,014.75 W	512,170.71	725,506.55	0.98	7,719.71	-15.52	
20,130.00	89.98	358.29	11,895.18	7,658.31 N	1,014.81 W	512,172.71	725,506.49	0.98	7,721.71	-15.52	
20,132.00	90.00	358.29	11,895.18	7,660.31 N	1,014.87 W	512,174.71	725,506.43	0.98	7,723.70	-15.52	
20,134.00	90.02	358.28	11,895.18	7,662.31 N	1,014.93 W	512,176.71	725,506.37	0.98	7,725.70	-15.52	
20,136.00	90.04	358.28	11,895.18	7,664.31 N	1,014.99 W	512,178.71	725,506.31	0.98	7,727.69	-15.52	
20,138.00	90.06	358.27	11,895.17	7,666.31 N	1,015.05 W	512,180.71	725,506.25	0.98	7,729.69	-15.52	
20,140.00	90.08	358.27	11,895.17	7,668.31 N	1,015.11 W	512,182.71	725,506.19	0.98	7,731.68	-15.52	
20,142.00	90.09	358.26	11,895.17	7,670.30 N	1,015.17 W	512,184.70	725,506.13	0.98	7,733.68	-15.52	
20,144.00	90.11	358.26	11,895.17	7,672.30 N	1,015.23 W	512,186.70	725,506.07	0.98	7,735.67	-15.52	
20,146.00	90.13	358.25	11,895.16	7,674.30 N	1,015.29 W	512,188.70	725,506.01	0.98	7,737.67	-15.52	
20,148.00	90.15	358.25	11,895.16	7,676.30 N	1,015.35 W	512,190.70	725,505.95	0.98	7,739.66	-15.52	
20,150.00	90.17	358.24	11,895.15	7,678.30 N	1,015.41 W	512,192.70	725,505.89	0.98	7,741.66	-15.52	
20,152.00	90.19	358.23	11,895.14	7,680.30 N	1,015.48 W	512,194.70	725,505.82	0.98	7,743.65	-15.52	
20,154.00	90.21	358.23	11,895.14	7,682.30 N	1,015.54 W	512,196.70	725,505.76	0.98	7,745.65	-15.52	
20,156.00	90.23	358.22	11,895.13	7,684.30 N	1,015.60 W	512,198.70	725,505.70	0.98	7,747.64	-15.52	

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Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
20,158.00	90.25	358.22	11,895.12	7,686.30 N	1,015.66 W	512,200.70	725,505.64	0.98	7,749.64	-15.52	
20,160.00	90.26	358.21	11,895.11	7,688.30 N	1,015.72 W	512,202.70	725,505.58	0.98	7,751.63	-15.52	
20,162.00	90.28	358.21	11,895.10	7,690.29 N	1,015.79 W	512,204.69	725,505.51	0.98	7,753.63	-15.52	
20,164.00	90.30	358.20	11,895.09	7,692.29 N	1,015.85 W	512,206.69	725,505.45	0.98	7,755.62	-15.52	
20,166.00	90.32	358.20	11,895.08	7,694.29 N	1,015.91 W	512,208.69	725,505.39	0.98	7,757.62	-15.52	
20,168.00	90.34	358.19	11,895.07	7,696.29 N	1,015.97 W	512,210.69	725,505.33	0.98	7,759.61	-15.52	
20,170.00	90.36	358.19	11,895.06	7,698.29 N	1,016.04 W	512,212.69	725,505.26	0.98	7,761.61	-15.52	
20,172.00	90.38	358.18	11,895.05	7,700.29 N	1,016.10 W	512,214.69	725,505.20	0.98	7,763.60	-15.52	
20,174.00	90.40	358.18	11,895.03	7,702.29 N	1,016.16 W	512,216.69	725,505.14	0.98	7,765.60	-15.52	
20,176.00	90.42	358.17	11,895.02	7,704.29 N	1,016.23 W	512,218.69	725,505.07	0.98	7,767.59	-15.52	
20,178.00	90.44	358.17	11,895.00	7,706.29 N	1,016.29 W	512,220.69	725,505.01	0.98	7,769.59	-15.52	
20,180.00	90.45	358.16	11,894.99	7,708.29 N	1,016.36 W	512,222.69	725,504.94	0.98	7,771.58	-15.52	
20,182.00	90.47	358.16	11,894.97	7,710.28 N	1,016.42 W	512,224.68	725,504.88	0.98	7,773.58	-15.52	
20,184.00	90.49	358.15	11,894.95	7,712.28 N	1,016.48 W	512,226.68	725,504.82	0.98	7,775.57	-15.52	
20,186.00	90.51	358.15	11,894.94	7,714.28 N	1,016.55 W	512,228.68	725,504.75	0.98	7,777.57	-15.52	
20,188.00	90.53	358.14	11,894.92	7,716.28 N	1,016.61 W	512,230.68	725,504.69	0.98	7,779.56	-15.52	
20,190.00	90.49	358.13	11,894.90	7,718.28 N	1,016.68 W	512,232.68	725,504.62	1.92	7,781.56	-161.68	
20,192.00	90.46	358.12	11,894.88	7,720.28 N	1,016.74 W	512,234.68	725,504.56	1.92	7,783.55	-161.68	
20,194.00	90.42	358.10	11,894.87	7,722.28 N	1,016.81 W	512,236.68	725,504.49	1.92	7,785.55	-161.68	
20,196.00	90.38	358.09	11,894.85	7,724.28 N	1,016.88 W	512,238.68	725,504.42	1.92	7,787.54	-161.68	
20,198.00	90.35	358.08	11,894.84	7,726.28 N	1,016.94 W	512,240.68	725,504.36	1.92	7,789.54	-161.68	
20,200.00	90.31	358.07	11,894.83	7,728.27 N	1,017.01 W	512,242.67	725,504.29	1.92	7,791.53	-161.68	
20,202.00	90.28	358.06	11,894.82	7,730.27 N	1,017.08 W	512,244.67	725,504.22	1.92	7,793.53	-161.68	
20,204.00	90.24	358.04	11,894.81	7,732.27 N	1,017.15 W	512,246.67	725,504.15	1.92	7,795.53	-161.68	
20,206.00	90.20	358.03	11,894.80	7,734.27 N	1,017.22 W	512,248.67	725,504.08	1.92	7,797.52	-161.68	
20,208.00	90.17	358.02	11,894.80	7,736.27 N	1,017.28 W	512,250.67	725,504.02	1.92	7,799.52	-161.68	
20,210.00	90.13	358.01	11,894.79	7,738.27 N	1,017.35 W	512,252.67	725,503.95	1.92	7,801.51	-161.68	
20,212.00	90.09	358.00	11,894.79	7,740.27 N	1,017.42 W	512,254.67	725,503.88	1.92	7,803.51	-161.68	
20,214.00	90.06	357.98	11,894.79	7,742.27 N	1,017.49 W	512,256.67	725,503.81	1.92	7,805.50	-161.68	
20,216.00	90.02	357.97	11,894.78	7,744.26 N	1,017.56 W	512,258.66	725,503.74	1.92	7,807.50	-161.68	
20,218.00	89.98	357.96	11,894.78	7,746.26 N	1,017.64 W	512,260.66	725,503.66	1.92	7,809.49	-161.68	
20,220.00	89.95	357.95	11,894.79	7,748.26 N	1,017.71 W	512,262.66	725,503.59	1.92	7,811.49	-161.68	
20,222.00	89.91	357.94	11,894.79	7,750.26 N	1,017.78 W	512,264.66	725,503.52	1.92	7,813.49	-161.68	
20,224.00	89.87	357.92	11,894.79	7,752.26 N	1,017.85 W	512,266.66	725,503.45	1.92	7,815.48	-161.68	
20,226.00	89.84	357.91	11,894.80	7,754.26 N	1,017.92 W	512,268.66	725,503.38	1.92	7,817.48	-161.68	
20,228.00	89.80	357.90	11,894.80	7,756.26 N	1,018.00 W	512,270.66	725,503.30	1.92	7,819.47	-161.68	
20,230.00	89.77	357.89	11,894.81	7,758.26 N	1,018.07 W	512,272.66	725,503.23	1.92	7,821.47	-161.68	

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Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
20,232.00	89.73	357.87	11,894.82	7,760.25 N	1,018.14 W	512,274.65	725,503.16	1.92	7,823.46	-161.68	
20,234.00	89.69	357.86	11,894.83	7,762.25 N	1,018.22 W	512,276.65	725,503.08	1.92	7,825.46	-161.68	
20,236.00	89.66	357.85	11,894.84	7,764.25 N	1,018.29 W	512,278.65	725,503.01	1.92	7,827.46	-161.68	
20,238.00	89.62	357.84	11,894.85	7,766.25 N	1,018.37 W	512,280.65	725,502.93	1.92	7,829.45	-161.68	
20,240.00	89.58	357.83	11,894.87	7,768.25 N	1,018.44 W	512,282.65	725,502.86	1.92	7,831.45	-161.68	
20,242.00	89.55	357.81	11,894.88	7,770.25 N	1,018.52 W	512,284.65	725,502.78	1.92	7,833.44	-161.68	
20,244.00	89.51	357.80	11,894.90	7,772.24 N	1,018.60 W	512,286.64	725,502.70	1.92	7,835.44	-161.68	
20,246.00	89.47	357.79	11,894.92	7,774.24 N	1,018.67 W	512,288.64	725,502.63	1.92	7,837.44	-161.68	
20,248.00	89.44	357.78	11,894.94	7,776.24 N	1,018.75 W	512,290.64	725,502.55	1.92	7,839.43	-161.68	
20,250.00	89.40	357.77	11,894.96	7,778.24 N	1,018.83 W	512,292.64	725,502.47	1.92	7,841.43	-161.68	
20,252.00	89.37	357.75	11,894.98	7,780.24 N	1,018.91 W	512,294.64	725,502.39	1.92	7,843.42	-161.68	
20,254.00	89.33	357.74	11,895.00	7,782.24 N	1,018.99 W	512,296.64	725,502.31	1.92	7,845.42	-161.68	
20,256.00	89.29	357.73	11,895.02	7,784.24 N	1,019.06 W	512,298.64	725,502.24	1.92	7,847.42	-161.68	
20,258.00	89.26	357.72	11,895.05	7,786.23 N	1,019.14 W	512,300.63	725,502.16	1.92	7,849.41	-161.68	
20,260.00	89.22	357.71	11,895.08	7,788.23 N	1,019.22 W	512,302.63	725,502.08	1.92	7,851.41	-161.68	
20,262.00	89.18	357.69	11,895.10	7,790.23 N	1,019.30 W	512,304.63	725,502.00	1.92	7,853.40	-161.68	
20,264.00	89.15	357.68	11,895.13	7,792.23 N	1,019.38 W	512,306.63	725,501.92	1.92	7,855.40	-161.68	
20,266.00	89.11	357.67	11,895.16	7,794.23 N	1,019.47 W	512,308.63	725,501.83	1.92	7,857.40	-161.68	
20,268.00	89.07	357.66	11,895.20	7,796.22 N	1,019.55 W	512,310.62	725,501.75	1.92	7,859.39	-161.68	
20,270.00	89.04	357.65	11,895.23	7,798.22 N	1,019.63 W	512,312.62	725,501.67	1.92	7,861.39	-161.68	
20,272.00	89.00	357.63	11,895.26	7,800.22 N	1,019.71 W	512,314.62	725,501.59	1.92	7,863.38	-161.68	
20,274.00	88.96	357.62	11,895.30	7,802.22 N	1,019.79 W	512,316.62	725,501.51	1.92	7,865.38	-161.68	
20,276.00	88.93	357.61	11,895.33	7,804.22 N	1,019.88 W	512,318.62	725,501.42	1.92	7,867.38	-161.68	
20,278.00	88.89	357.60	11,895.37	7,806.21 N	1,019.96 W	512,320.61	725,501.34	1.92	7,869.37	-161.67	
20,280.00	88.86	357.59	11,895.41	7,808.21 N	1,020.04 W	512,322.61	725,501.26	1.92	7,871.37	-161.67	
20,282.00	88.82	357.57	11,895.45	7,810.21 N	1,020.13 W	512,324.61	725,501.17	1.92	7,873.36	-161.67	
20,284.00	88.78	357.56	11,895.49	7,812.21 N	1,020.21 W	512,326.61	725,501.09	1.92	7,875.36	-161.67	
20,286.00	88.75	357.55	11,895.54	7,814.21 N	1,020.30 W	512,328.61	725,501.00	1.92	7,877.36	-161.67	
20,288.00	88.71	357.54	11,895.58	7,816.20 N	1,020.39 W	512,330.60	725,500.91	1.92	7,879.35	-161.67	
20,290.00	88.67	357.53	11,895.63	7,818.20 N	1,020.47 W	512,332.60	725,500.83	1.92	7,881.35	-161.67	
20,292.00	88.64	357.51	11,895.67	7,820.20 N	1,020.56 W	512,334.60	725,500.74	1.92	7,883.34	-161.67	
20,294.00	88.60	357.50	11,895.72	7,822.20 N	1,020.64 W	512,336.60	725,500.66	1.92	7,885.34	-161.67	
20,296.00	88.56	357.49	11,895.77	7,824.19 N	1,020.73 W	512,338.59	725,500.57	1.92	7,887.34	-161.67	
20,298.00	88.53	357.48	11,895.82	7,826.19 N	1,020.82 W	512,340.59	725,500.48	1.92	7,889.33	-161.67	
20,300.00	88.49	357.46	11,895.88	7,828.19 N	1,020.91 W	512,342.59	725,500.39	1.92	7,891.33	-161.67	
20,302.00	88.46	357.45	11,895.93	7,830.19 N	1,021.00 W	512,344.59	725,500.30	1.92	7,893.33	-161.67	

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Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
20,304.00	88.42	357.44	11,895.98	7,832.18 N	1,021.09 W	512,346.58	725,500.21	1.92	7,895.32	-161.67	
20,306.00	88.38	357.43	11,896.04	7,834.18 N	1,021.18 W	512,348.58	725,500.12	1.92	7,897.32	-161.67	
20,308.00	88.35	357.42	11,896.10	7,836.18 N	1,021.27 W	512,350.58	725,500.03	1.92	7,899.31	-161.67	
20,310.00	88.31	357.40	11,896.15	7,838.17 N	1,021.36 W	512,352.57	725,499.94	1.92	7,901.31	-161.67	
20,312.00	88.27	357.39	11,896.21	7,840.17 N	1,021.45 W	512,354.57	725,499.85	1.92	7,903.31	-161.67	
20,314.00	88.24	357.38	11,896.27	7,842.17 N	1,021.54 W	512,356.57	725,499.76	1.92	7,905.30	-161.67	
20,316.00	88.20	357.37	11,896.34	7,844.16 N	1,021.63 W	512,358.56	725,499.67	1.92	7,907.30	-161.67	
20,318.00	88.16	357.36	11,896.40	7,846.16 N	1,021.72 W	512,360.56	725,499.58	1.92	7,909.29	-161.67	
20,320.00	88.13	357.34	11,896.47	7,848.16 N	1,021.81 W	512,362.56	725,499.49	1.92	7,911.29	-161.67	
20,322.00	88.09	357.33	11,896.53	7,850.16 N	1,021.91 W	512,364.56	725,499.39	1.92	7,913.28	-161.67	
20,324.00	88.05	357.32	11,896.60	7,852.15 N	1,022.00 W	512,366.55	725,499.30	1.92	7,915.28	-161.67	
20,326.00	88.02	357.31	11,896.67	7,854.15 N	1,022.09 W	512,368.55	725,499.21	1.92	7,917.28	-161.67	
20,328.00	87.98	357.30	11,896.74	7,856.15 N	1,022.19 W	512,370.55	725,499.11	1.92	7,919.27	-161.67	
20,330.00	87.95	357.28	11,896.81	7,858.14 N	1,022.28 W	512,372.54	725,499.02	1.92	7,921.27	-161.67	
20,332.00	87.91	357.27	11,896.88	7,860.14 N	1,022.38 W	512,374.54	725,498.92	1.92	7,923.26	-161.67	
20,334.00	87.87	357.26	11,896.95	7,862.13 N	1,022.47 W	512,376.53	725,498.83	1.92	7,925.26	-161.67	
20,336.00	87.84	357.25	11,897.03	7,864.13 N	1,022.57 W	512,378.53	725,498.73	1.92	7,927.26	-161.67	
20,338.00	87.80	357.24	11,897.10	7,866.13 N	1,022.66 W	512,380.53	725,498.64	1.92	7,929.25	-161.66	
20,340.00	87.76	357.22	11,897.18	7,868.12 N	1,022.76 W	512,382.52	725,498.54	1.92	7,931.25	-161.66	
20,342.00	87.73	357.21	11,897.26	7,870.12 N	1,022.86 W	512,384.52	725,498.44	1.92	7,933.24	-161.66	
20,344.00	87.69	357.20	11,897.34	7,872.12 N	1,022.96 W	512,386.52	725,498.34	1.92	7,935.24	-161.66	
20,346.00	87.65	357.19	11,897.42	7,874.11 N	1,023.05 W	512,388.51	725,498.25	1.92	7,937.23	-161.66	
20,348.00	87.62	357.18	11,897.50	7,876.11 N	1,023.15 W	512,390.51	725,498.15	1.92	7,939.23	-161.66	
20,350.00	87.58	357.16	11,897.59	7,878.10 N	1,023.25 W	512,392.50	725,498.05	1.92	7,941.22	-161.66	
20,352.00	87.54	357.15	11,897.67	7,880.10 N	1,023.35 W	512,394.50	725,497.95	1.92	7,943.22	-161.66	
20,354.00	87.51	357.14	11,897.76	7,882.09 N	1,023.45 W	512,396.49	725,497.85	1.92	7,945.22	-161.66	
20,356.00	87.47	357.13	11,897.85	7,884.09 N	1,023.55 W	512,398.49	725,497.75	1.92	7,947.21	-161.66	
20,358.00	87.44	357.11	11,897.94	7,886.09 N	1,023.65 W	512,400.49	725,497.65	1.92	7,949.21	-161.66	
20,360.00	87.40	357.10	11,898.03	7,888.08 N	1,023.75 W	512,402.48	725,497.55	1.92	7,951.20	-161.66	
20,362.00	87.36	357.09	11,898.12	7,890.08 N	1,023.85 W	512,404.48	725,497.45	1.92	7,953.20	-161.66	
20,364.00	87.33	357.08	11,898.21	7,892.07 N	1,023.95 W	512,406.47	725,497.35	1.92	7,955.19	-161.66	
20,366.00	87.29	357.07	11,898.30	7,894.07 N	1,024.05 W	512,408.47	725,497.25	1.92	7,957.19	-161.66	
20,368.00	87.25	357.05	11,898.40	7,896.06 N	1,024.16 W	512,410.46	725,497.14	1.92	7,959.18	-161.66	
20,370.00	87.22	357.04	11,898.50	7,898.06 N	1,024.26 W	512,412.46	725,497.04	1.92	7,961.18	-161.66	
20,372.00	87.18	357.03	11,898.59	7,900.05 N	1,024.36 W	512,414.45	725,496.94	1.92	7,963.17	-161.66	
20,374.00	87.14	357.02	11,898.69	7,902.05 N	1,024.47 W	512,416.45	725,496.83	1.92	7,965.17	-161.66	
20,376.00	87.11	357.01	11,898.79	7,904.04 N	1,024.57 W	512,418.44	725,496.73	1.92	7,967.16	-161.65	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
20,378.00	87.11	357.01	11,898.89	7,906.04 N	1,024.68 W	512,420.44	725,496.62	0.36	7,969.16	25.45	
20,380.00	87.16	357.03	11,898.99	7,908.03 N	1,024.78 W	512,422.43	725,496.52	2.63	7,971.15	20.27	
20,382.00	87.21	357.05	11,899.09	7,910.03 N	1,024.88 W	512,424.43	725,496.42	2.63	7,973.15	20.27	
20,384.00	87.26	357.06	11,899.19	7,912.02 N	1,024.99 W	512,426.42	725,496.31	2.63	7,975.14	20.27	
20,386.00	87.31	357.08	11,899.28	7,914.02 N	1,025.09 W	512,428.42	725,496.21	2.63	7,977.14	20.27	
20,388.00	87.36	357.10	11,899.38	7,916.01 N	1,025.19 W	512,430.41	725,496.11	2.63	7,979.13	20.27	
20,390.00	87.41	357.12	11,899.47	7,918.01 N	1,025.29 W	512,432.41	725,496.01	2.63	7,981.13	20.27	
20,392.00	87.46	357.14	11,899.56	7,920.00 N	1,025.39 W	512,434.40	725,495.91	2.63	7,983.13	20.27	
20,394.00	87.51	357.15	11,899.64	7,922.00 N	1,025.49 W	512,436.40	725,495.81	2.63	7,985.12	20.27	
20,396.00	87.56	357.17	11,899.73	7,923.99 N	1,025.59 W	512,438.39	725,495.71	2.63	7,987.12	20.27	
20,398.00	87.61	357.19	11,899.81	7,925.99 N	1,025.69 W	512,440.39	725,495.61	2.63	7,989.11	20.27	
20,400.00	87.66	357.21	11,899.90	7,927.99 N	1,025.78 W	512,442.39	725,495.52	2.63	7,991.11	20.26	
20,402.00	87.71	357.23	11,899.98	7,929.98 N	1,025.88 W	512,444.38	725,495.42	2.63	7,993.10	20.26	
20,404.00	87.76	357.25	11,900.06	7,931.98 N	1,025.98 W	512,446.38	725,495.32	2.63	7,995.10	20.26	
20,406.00	87.80	357.26	11,900.13	7,933.97 N	1,026.07 W	512,448.37	725,495.23	2.63	7,997.09	20.26	
20,408.00	87.85	357.28	11,900.21	7,935.97 N	1,026.17 W	512,450.37	725,495.13	2.63	7,999.09	20.26	
20,410.00	87.90	357.30	11,900.28	7,937.97 N	1,026.26 W	512,452.37	725,495.04	2.63	8,001.09	20.26	
20,412.00	87.95	357.32	11,900.36	7,939.96 N	1,026.36 W	512,454.36	725,494.94	2.63	8,003.08	20.26	
20,414.00	88.00	357.34	11,900.43	7,941.96 N	1,026.45 W	512,456.36	725,494.85	2.63	8,005.08	20.26	
20,416.00	88.05	357.36	11,900.50	7,943.96 N	1,026.54 W	512,458.36	725,494.76	2.63	8,007.07	20.26	
20,418.00	88.10	357.37	11,900.56	7,945.95 N	1,026.63 W	512,460.35	725,494.67	2.63	8,009.07	20.26	
20,420.00	88.15	357.39	11,900.63	7,947.95 N	1,026.72 W	512,462.35	725,494.58	2.63	8,011.06	20.26	
20,422.00	88.20	357.41	11,900.69	7,949.95 N	1,026.82 W	512,464.35	725,494.48	2.63	8,013.06	20.26	
20,424.00	88.25	357.43	11,900.75	7,951.94 N	1,026.91 W	512,466.34	725,494.39	2.63	8,015.06	20.26	
20,426.00	88.30	357.45	11,900.81	7,953.94 N	1,027.00 W	512,468.34	725,494.30	2.63	8,017.05	20.26	
20,428.00	88.35	357.46	11,900.87	7,955.94 N	1,027.08 W	512,470.34	725,494.22	2.63	8,019.05	20.26	
20,430.00	88.40	357.48	11,900.93	7,957.94 N	1,027.17 W	512,472.34	725,494.13	2.63	8,021.04	20.25	
20,432.00	88.45	357.50	11,900.99	7,959.93 N	1,027.26 W	512,474.33	725,494.04	2.63	8,023.04	20.25	
20,434.00	88.50	357.52	11,901.04	7,961.93 N	1,027.35 W	512,476.33	725,493.95	2.63	8,025.04	20.25	
20,436.00	88.54	357.54	11,901.09	7,963.93 N	1,027.43 W	512,478.33	725,493.87	2.63	8,027.03	20.25	
20,438.00	88.59	357.56	11,901.14	7,965.92 N	1,027.52 W	512,480.32	725,493.78	2.63	8,029.03	20.25	
20,440.00	88.64	357.57	11,901.19	7,967.92 N	1,027.60 W	512,482.32	725,493.70	2.63	8,031.02	20.25	
20,442.00	88.69	357.59	11,901.24	7,969.92 N	1,027.69 W	512,484.32	725,493.61	2.63	8,033.02	20.25	
20,444.00	88.74	357.61	11,901.28	7,971.92 N	1,027.77 W	512,486.32	725,493.53	2.63	8,035.02	20.25	
20,446.00	88.79	357.63	11,901.32	7,973.92 N	1,027.85 W	512,488.32	725,493.45	2.63	8,037.01	20.25	
20,448.00	88.84	357.65	11,901.36	7,975.91 N	1,027.94 W	512,490.31	725,493.36	2.63	8,039.01	20.25	
20,450.00	88.89	357.66	11,901.40	7,977.91 N	1,028.02 W	512,492.31	725,493.28	2.63	8,041.00	20.25	



Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
20,452.00	88.94	357.68	11,901.44	7,979.91 N	1,028.10 W	512,494.31	725,493.20	2.63	8,043.00	20.25	
20,454.00	88.99	357.70	11,901.48	7,981.91 N	1,028.18 W	512,496.31	725,493.12	2.63	8,044.99	20.25	
20,456.00	89.04	357.72	11,901.51	7,983.91 N	1,028.26 W	512,498.31	725,493.04	2.63	8,046.99	20.25	
20,458.00	89.09	357.74	11,901.55	7,985.90 N	1,028.34 W	512,500.30	725,492.96	2.63	8,048.99	20.25	
20,460.00	89.14	357.76	11,901.58	7,987.90 N	1,028.42 W	512,502.30	725,492.88	2.63	8,050.98	20.25	
20,462.00	89.19	357.77	11,901.61	7,989.90 N	1,028.50 W	512,504.30	725,492.80	2.63	8,052.98	20.25	
20,464.00	89.24	357.79	11,901.63	7,991.90 N	1,028.57 W	512,506.30	725,492.73	2.63	8,054.97	20.25	
20,466.00	89.28	357.81	11,901.66	7,993.90 N	1,028.65 W	512,508.30	725,492.65	2.63	8,056.97	20.25	
20,468.00	89.33	357.83	11,901.68	7,995.90 N	1,028.73 W	512,510.30	725,492.57	2.63	8,058.97	20.25	
20,470.00	89.38	357.85	11,901.71	7,997.89 N	1,028.80 W	512,512.29	725,492.50	2.63	8,060.96	20.25	
20,472.00	89.43	357.86	11,901.73	7,999.89 N	1,028.88 W	512,514.29	725,492.42	2.63	8,062.96	20.25	
20,474.00	89.48	357.88	11,901.74	8,001.89 N	1,028.95 W	512,516.29	725,492.35	2.63	8,064.95	20.25	
20,476.00	89.53	357.90	11,901.76	8,003.89 N	1,029.02 W	512,518.29	725,492.28	2.63	8,066.95	20.25	
20,478.00	89.58	357.92	11,901.78	8,005.89 N	1,029.10 W	512,520.29	725,492.20	2.63	8,068.94	20.25	
20,480.00	89.63	357.94	11,901.79	8,007.89 N	1,029.17 W	512,522.29	725,492.13	2.63	8,070.94	20.25	
20,482.00	89.68	357.96	11,901.80	8,009.89 N	1,029.24 W	512,524.29	725,492.06	2.63	8,072.94	20.25	
20,484.00	89.73	357.97	11,901.81	8,011.88 N	1,029.31 W	512,526.28	725,491.99	2.63	8,074.93	20.25	
20,486.00	89.78	357.99	11,901.82	8,013.88 N	1,029.38 W	512,528.28	725,491.92	2.63	8,076.93	20.25	
20,488.00	89.83	358.01	11,901.83	8,015.88 N	1,029.45 W	512,530.28	725,491.85	2.63	8,078.92	20.25	
20,490.00	89.88	358.03	11,901.83	8,017.88 N	1,029.52 W	512,532.28	725,491.78	2.63	8,080.92	20.25	
20,492.00	89.93	358.05	11,901.84	8,019.88 N	1,029.59 W	512,534.28	725,491.71	2.63	8,082.91	20.25	
20,494.00	89.97	358.06	11,901.84	8,021.88 N	1,029.66 W	512,536.28	725,491.64	2.63	8,084.91	20.25	
20,496.00	90.02	358.08	11,901.84	8,023.88 N	1,029.72 W	512,538.28	725,491.58	2.63	8,086.90	20.25	
20,498.00	90.07	358.10	11,901.84	8,025.88 N	1,029.79 W	512,540.28	725,491.51	2.63	8,088.90	20.25	
20,500.00	90.12	358.12	11,901.83	8,027.87 N	1,029.86 W	512,542.27	725,491.44	2.63	8,090.90	20.25	
20,502.00	90.17	358.14	11,901.83	8,029.87 N	1,029.92 W	512,544.27	725,491.38	2.63	8,092.89	20.25	
20,504.00	90.22	358.16	11,901.82	8,031.87 N	1,029.99 W	512,546.27	725,491.31	2.63	8,094.89	20.25	
20,506.00	90.27	358.17	11,901.81	8,033.87 N	1,030.05 W	512,548.27	725,491.25	2.63	8,096.88	20.25	
20,508.00	90.32	358.19	11,901.80	8,035.87 N	1,030.11 W	512,550.27	725,491.19	2.63	8,098.88	20.25	
20,510.00	90.37	358.21	11,901.79	8,037.87 N	1,030.18 W	512,552.27	725,491.12	2.63	8,100.87	20.25	
20,512.00	90.42	358.23	11,901.78	8,039.87 N	1,030.24 W	512,554.27	725,491.06	2.63	8,102.87	20.25	
20,514.00	90.47	358.25	11,901.76	8,041.87 N	1,030.30 W	512,556.27	725,491.00	2.63	8,104.86	20.25	
20,516.00	90.52	358.27	11,901.75	8,043.87 N	1,030.36 W	512,558.27	725,490.94	2.63	8,106.86	20.25	
20,518.00	90.57	358.28	11,901.73	8,045.87 N	1,030.42 W	512,560.27	725,490.88	2.63	8,108.85	20.25	
20,520.00	90.62	358.30	11,901.71	8,047.86 N	1,030.48 W	512,562.26	725,490.82	2.63	8,110.85	20.25	
20,522.00	90.67	358.32	11,901.68	8,049.86 N	1,030.54 W	512,564.26	725,490.76	2.63	8,112.84	20.25	

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Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates (usft)		Map Coordinates (usft)		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing	Easting	Northing	Easting				
20,524.00	90.71	358.34	11,901.66	8,051.86 N	1,030.60 W	512,566.26	725,490.70	2.63	8,114.84	20.25	
20,526.00	90.76	358.36	11,901.63	8,053.86 N	1,030.66 W	512,568.26	725,490.64	2.63	8,116.83	20.25	
20,528.00	90.81	358.37	11,901.61	8,055.86 N	1,030.71 W	512,570.26	725,490.59	2.63	8,118.82	20.25	
20,530.00	90.86	358.39	11,901.58	8,057.86 N	1,030.77 W	512,572.26	725,490.53	2.63	8,120.82	20.25	
20,532.00	90.91	358.41	11,901.55	8,059.86 N	1,030.83 W	512,574.26	725,490.47	2.63	8,122.81	20.25	
20,534.00	90.96	358.43	11,901.51	8,061.86 N	1,030.88 W	512,576.26	725,490.42	2.63	8,124.81	20.25	
20,536.00	91.01	358.45	11,901.48	8,063.86 N	1,030.94 W	512,578.26	725,490.36	2.63	8,126.80	20.25	
20,538.00	91.06	358.47	11,901.44	8,065.86 N	1,030.99 W	512,580.26	725,490.31	2.63	8,128.80	20.25	
20,540.00	91.11	358.48	11,901.40	8,067.85 N	1,031.04 W	512,582.25	725,490.26	2.63	8,130.79	20.25	
20,542.00	91.16	358.50	11,901.37	8,069.85 N	1,031.10 W	512,584.25	725,490.20	2.63	8,132.78	20.25	
20,544.00	91.21	358.52	11,901.32	8,071.85 N	1,031.15 W	512,586.25	725,490.15	2.63	8,134.78	20.25	
20,546.00	91.26	358.54	11,901.28	8,073.85 N	1,031.20 W	512,588.25	725,490.10	2.63	8,136.77	20.25	
20,548.00	91.31	358.56	11,901.24	8,075.85 N	1,031.25 W	512,590.25	725,490.05	2.63	8,138.77	20.25	
20,550.00	91.36	358.57	11,901.19	8,077.85 N	1,031.30 W	512,592.25	725,490.00	2.63	8,140.76	20.25	
20,552.00	91.40	358.59	11,901.14	8,079.85 N	1,031.35 W	512,594.25	725,489.95	2.63	8,142.75	20.25	
20,554.00	91.45	358.61	11,901.09	8,081.85 N	1,031.40 W	512,596.25	725,489.90	2.63	8,144.75	20.25	
20,556.00	91.50	358.63	11,901.04	8,083.84 N	1,031.45 W	512,598.24	725,489.85	2.63	8,146.74	20.25	
20,558.00	91.55	358.65	11,900.99	8,085.84 N	1,031.49 W	512,600.24	725,489.81	2.63	8,148.73	20.25	
20,560.00	91.60	358.67	11,900.93	8,087.84 N	1,031.54 W	512,602.24	725,489.76	2.63	8,150.73	20.25	
20,562.00	91.65	358.68	11,900.87	8,089.84 N	1,031.59 W	512,604.24	725,489.71	2.63	8,152.72	20.25	
20,564.00	91.70	358.70	11,900.82	8,091.84 N	1,031.63 W	512,606.24	725,489.67	2.63	8,154.71	20.25	
20,566.00	91.75	358.72	11,900.76	8,093.84 N	1,031.68 W	512,608.24	725,489.62	2.63	8,156.70	20.26	
20,568.00	91.72	358.76	11,900.70	8,095.84 N	1,031.72 W	512,610.24	725,489.58	2.31	8,158.70	129.76	
20,570.00	91.69	358.79	11,900.64	8,097.84 N	1,031.76 W	512,612.24	725,489.54	2.31	8,160.69	129.76	
20,572.00	91.66	358.83	11,900.58	8,099.83 N	1,031.81 W	512,614.23	725,489.49	2.31	8,162.68	129.76	
20,574.00	91.63	358.86	11,900.52	8,101.83 N	1,031.85 W	512,616.23	725,489.45	2.31	8,164.68	129.76	
20,576.00	91.60	358.90	11,900.46	8,103.83 N	1,031.88 W	512,618.23	725,489.42	2.31	8,166.67	129.76	
20,578.00	91.57	358.93	11,900.41	8,105.83 N	1,031.92 W	512,620.23	725,489.38	2.31	8,168.66	129.76	
20,580.00	91.54	358.97	11,900.35	8,107.83 N	1,031.96 W	512,622.23	725,489.34	2.31	8,170.65	129.76	
20,582.00	91.51	359.00	11,900.30	8,109.83 N	1,031.99 W	512,624.23	725,489.31	2.31	8,172.64	129.77	
20,584.00	91.48	359.04	11,900.25	8,111.83 N	1,032.03 W	512,626.23	725,489.27	2.31	8,174.64	129.77	
20,586.00	91.45	359.08	11,900.20	8,113.83 N	1,032.06 W	512,628.23	725,489.24	2.31	8,176.63	129.77	
20,588.00	91.42	359.11	11,900.15	8,115.83 N	1,032.09 W	512,630.23	725,489.21	2.31	8,178.62	129.77	
20,590.00	91.40	359.15	11,900.10	8,117.82 N	1,032.12 W	512,632.22	725,489.18	2.31	8,180.61	129.77	
20,592.00	91.37	359.18	11,900.05	8,119.82 N	1,032.15 W	512,634.22	725,489.15	2.31	8,182.60	129.77	
20,594.00	91.34	359.22	11,900.00	8,121.82 N	1,032.18 W	512,636.22	725,489.12	2.31	8,184.60	129.77	
20,596.00	91.31	359.25	11,899.96	8,123.82 N	1,032.21 W	512,638.22	725,489.09	2.31	8,186.59	129.77	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
20,598.00	91.28	359.29	11,899.91	8,125.82 N	1,032.23 W	512,640.22	725,489.07	2.31	8,188.58	129.77	
20,600.00	91.25	359.32	11,899.87	8,127.82 N	1,032.26 W	512,642.22	725,489.04	2.31	8,190.57	129.77	
20,602.00	91.22	359.36	11,899.82	8,129.82 N	1,032.28 W	512,644.22	725,489.02	2.31	8,192.56	129.77	
20,604.00	91.19	359.40	11,899.78	8,131.82 N	1,032.30 W	512,646.22	725,489.00	2.31	8,194.55	129.78	
20,606.00	91.16	359.43	11,899.74	8,133.82 N	1,032.32 W	512,648.22	725,488.98	2.31	8,196.55	129.78	
20,608.00	91.13	359.47	11,899.70	8,135.82 N	1,032.34 W	512,650.22	725,488.96	2.31	8,198.54	129.78	
20,610.00	91.10	359.50	11,899.66	8,137.82 N	1,032.36 W	512,652.22	725,488.94	2.31	8,200.53	129.78	
20,612.00	91.07	359.54	11,899.62	8,139.82 N	1,032.38 W	512,654.22	725,488.92	2.31	8,202.52	129.78	
20,614.00	91.04	359.57	11,899.59	8,141.82 N	1,032.39 W	512,656.22	725,488.91	2.31	8,204.51	129.78	
20,616.00	91.01	359.61	11,899.55	8,143.82 N	1,032.41 W	512,658.22	725,488.89	2.31	8,206.50	129.78	
20,618.00	90.98	359.64	11,899.52	8,145.82 N	1,032.42 W	512,660.22	725,488.88	2.31	8,208.49	129.78	
20,620.00	90.95	359.68	11,899.48	8,147.82 N	1,032.43 W	512,662.22	725,488.87	2.31	8,210.48	129.78	
20,622.00	90.92	359.72	11,899.45	8,149.82 N	1,032.44 W	512,664.22	725,488.86	2.31	8,212.47	129.78	
20,624.00	90.89	359.75	11,899.42	8,151.82 N	1,032.45 W	512,666.22	725,488.85	2.31	8,214.46	129.78	
20,626.00	90.86	359.79	11,899.39	8,153.82 N	1,032.46 W	512,668.22	725,488.84	2.31	8,216.45	129.78	
20,628.00	90.83	359.82	11,899.36	8,155.82 N	1,032.47 W	512,670.22	725,488.83	2.31	8,218.44	129.78	
20,630.00	90.80	359.86	11,899.33	8,157.82 N	1,032.47 W	512,672.22	725,488.83	2.31	8,220.43	129.78	
20,632.00	90.77	359.89	11,899.30	8,159.82 N	1,032.48 W	512,674.22	725,488.82	2.31	8,222.42	129.78	
20,634.00	90.74	359.93	11,899.28	8,161.82 N	1,032.48 W	512,676.22	725,488.82	2.31	8,224.41	129.78	
20,636.00	90.71	359.96	11,899.25	8,163.82 N	1,032.48 W	512,678.22	725,488.82	2.31	8,226.40	129.78	
20,638.00	90.69	360.00	11,899.23	8,165.81 N	1,032.48 W	512,680.21	725,488.82	2.31	8,228.39	129.79	
20,640.00	90.66	0.03	11,899.20	8,167.81 N	1,032.48 W	512,682.21	725,488.82	2.31	8,230.38	129.79	
20,642.00	90.63	0.07	11,899.18	8,169.81 N	1,032.48 W	512,684.21	725,488.82	2.31	8,232.37	129.79	
20,644.00	90.60	0.11	11,899.16	8,171.81 N	1,032.48 W	512,686.21	725,488.82	2.31	8,234.36	129.79	
20,646.00	90.57	0.14	11,899.14	8,173.81 N	1,032.47 W	512,688.21	725,488.83	2.31	8,236.35	129.79	
20,648.00	90.54	0.18	11,899.12	8,175.81 N	1,032.47 W	512,690.21	725,488.83	2.31	8,238.34	129.79	
20,650.00	90.51	0.21	11,899.10	8,177.81 N	1,032.46 W	512,692.21	725,488.84	2.31	8,240.33	129.79	
20,652.00	90.48	0.25	11,899.08	8,179.81 N	1,032.45 W	512,694.21	725,488.85	2.31	8,242.32	129.79	
20,654.00	90.45	0.28	11,899.07	8,181.81 N	1,032.44 W	512,696.21	725,488.86	2.31	8,244.31	129.79	
20,656.00	90.42	0.32	11,899.05	8,183.81 N	1,032.43 W	512,698.21	725,488.87	2.31	8,246.29	129.79	
20,658.00	90.39	0.35	11,899.04	8,185.81 N	1,032.42 W	512,700.21	725,488.88	2.31	8,248.28	129.79	
20,660.00	90.36	0.39	11,899.03	8,187.81 N	1,032.41 W	512,702.21	725,488.89	2.31	8,250.27	129.79	
20,662.00	90.35	0.37	11,899.01	8,189.81 N	1,032.39 W	512,704.21	725,488.91	1.22	8,252.26	-111.25	
20,664.00	90.34	0.34	11,899.00	8,191.81 N	1,032.38 W	512,706.21	725,488.92	1.22	8,254.25	-111.25	
20,666.00	90.33	0.32	11,898.99	8,193.81 N	1,032.37 W	512,708.21	725,488.93	1.22	8,256.24	-111.25	
20,668.00	90.32	0.30	11,898.98	8,195.81 N	1,032.36 W	512,710.21	725,488.94	1.22	8,258.22	-111.25	
20,670.00	90.32	0.28	11,898.97	8,197.81 N	1,032.35 W	512,712.21	725,488.95	1.22	8,260.21	-111.25	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Tooface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
20,672.00	90.31	0.25	11,898.96	8,199.81 N	1,032.34 W	512,714.21	725,488.96	1.22	8,262.20	-111.25	
20,674.00	90.30	0.23	11,898.94	8,201.81 N	1,032.33 W	512,716.21	725,488.97	1.22	8,264.19	-111.25	
20,676.00	90.29	0.21	11,898.93	8,203.81 N	1,032.32 W	512,718.21	725,488.98	1.22	8,266.18	-111.25	
20,678.00	90.28	0.19	11,898.92	8,205.81 N	1,032.32 W	512,720.21	725,488.98	1.22	8,268.17	-111.25	
20,680.00	90.27	0.16	11,898.92	8,207.81 N	1,032.31 W	512,722.21	725,488.99	1.22	8,270.16	-111.25	
20,682.00	90.26	0.14	11,898.91	8,209.81 N	1,032.30 W	512,724.21	725,489.00	1.22	8,272.15	-111.25	
20,684.00	90.25	0.12	11,898.90	8,211.81 N	1,032.30 W	512,726.21	725,489.00	1.22	8,274.14	-111.25	
20,686.00	90.25	0.09	11,898.89	8,213.81 N	1,032.30 W	512,728.21	725,489.00	1.22	8,276.13	-111.25	
20,688.00	90.24	0.07	11,898.88	8,215.81 N	1,032.29 W	512,730.21	725,489.01	1.22	8,278.11	-111.25	
20,690.00	90.23	0.05	11,898.87	8,217.81 N	1,032.29 W	512,732.21	725,489.01	1.22	8,280.10	-111.25	
20,692.00	90.22	0.03	11,898.86	8,219.81 N	1,032.29 W	512,734.21	725,489.01	1.22	8,282.09	-111.25	
20,694.00	90.21	0.00	11,898.86	8,221.81 N	1,032.29 W	512,736.21	725,489.01	1.22	8,284.08	-111.25	
20,696.00	90.20	359.98	11,898.85	8,223.81 N	1,032.29 W	512,738.21	725,489.01	1.22	8,286.07	-111.25	
20,698.00	90.19	359.96	11,898.84	8,225.81 N	1,032.29 W	512,740.21	725,489.01	1.22	8,288.06	-111.25	
20,700.00	90.18	359.94	11,898.84	8,227.81 N	1,032.29 W	512,742.21	725,489.01	1.22	8,290.05	-111.25	
20,702.00	90.17	359.91	11,898.83	8,229.81 N	1,032.30 W	512,744.21	725,489.00	1.22	8,292.04	-111.25	
20,704.00	90.17	359.89	11,898.82	8,231.81 N	1,032.30 W	512,746.21	725,489.00	1.22	8,294.03	-111.25	
20,706.00	90.16	359.87	11,898.82	8,233.81 N	1,032.30 W	512,748.21	725,489.00	1.22	8,296.02	-111.25	
20,708.00	90.15	359.84	11,898.81	8,235.81 N	1,032.31 W	512,750.21	725,488.99	1.22	8,298.01	-111.25	
20,710.00	90.14	359.82	11,898.81	8,237.81 N	1,032.31 W	512,752.21	725,488.99	1.22	8,300.00	-111.25	
20,712.00	90.13	359.80	11,898.80	8,239.81 N	1,032.32 W	512,754.21	725,488.98	1.22	8,301.99	-111.25	
20,714.00	90.12	359.78	11,898.80	8,241.81 N	1,032.33 W	512,756.21	725,488.97	1.22	8,303.98	-111.25	
20,716.00	90.11	359.75	11,898.79	8,243.81 N	1,032.34 W	512,758.21	725,488.96	1.22	8,305.97	-111.25	
20,718.00	90.10	359.73	11,898.79	8,245.81 N	1,032.35 W	512,760.21	725,488.95	1.22	8,307.97	-111.25	
20,720.00	90.09	359.71	11,898.79	8,247.81 N	1,032.36 W	512,762.21	725,488.94	1.22	8,309.96	-111.25	
20,722.00	90.09	359.69	11,898.78	8,249.81 N	1,032.37 W	512,764.21	725,488.93	1.22	8,311.95	-111.25	
20,724.00	90.08	359.66	11,898.78	8,251.81 N	1,032.38 W	512,766.21	725,488.92	1.22	8,313.94	-111.25	
20,726.00	90.07	359.64	11,898.78	8,253.81 N	1,032.39 W	512,768.21	725,488.91	1.22	8,315.93	-111.25	
20,728.00	90.06	359.62	11,898.78	8,255.81 N	1,032.40 W	512,770.21	725,488.90	1.22	8,317.92	-111.25	
20,730.00	90.05	359.59	11,898.77	8,257.81 N	1,032.42 W	512,772.21	725,488.88	1.22	8,319.91	-111.25	
20,732.00	90.04	359.57	11,898.77	8,259.81 N	1,032.43 W	512,774.21	725,488.87	1.22	8,321.90	-111.25	
20,734.00	90.03	359.55	11,898.77	8,261.81 N	1,032.45 W	512,776.21	725,488.85	1.22	8,323.89	-111.25	
20,736.00	90.02	359.53	11,898.77	8,263.81 N	1,032.46 W	512,778.21	725,488.84	1.22	8,325.88	-111.25	
20,738.00	90.02	359.50	11,898.77	8,265.81 N	1,032.48 W	512,780.21	725,488.82	1.22	8,327.88	-111.25	
20,740.00	90.01	359.48	11,898.77	8,267.81 N	1,032.50 W	512,782.21	725,488.80	1.22	8,329.87	-111.25	
20,742.00	90.00	359.46	11,898.77	8,269.81 N	1,032.52 W	512,784.21	725,488.78	1.22	8,331.86	-111.25	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
20,744.00	89.99	359.44	11,898.77	8,271.81 N	1,032.53 W	512,786.21	725,488.77	1.22	8,333.85	-111.25	
20,746.00	89.98	359.41	11,898.77	8,273.81 N	1,032.55 W	512,788.21	725,488.75	1.22	8,335.84	-111.25	
20,748.00	89.97	359.39	11,898.77	8,275.81 N	1,032.58 W	512,790.21	725,488.72	1.22	8,337.83	-111.25	
20,750.00	89.96	359.37	11,898.77	8,277.81 N	1,032.60 W	512,792.21	725,488.70	1.22	8,339.83	-111.25	
20,752.00	89.95	359.34	11,898.77	8,279.81 N	1,032.62 W	512,794.21	725,488.68	1.22	8,341.82	-111.25	
20,754.00	89.94	359.32	11,898.78	8,281.81 N	1,032.64 W	512,796.21	725,488.66	1.22	8,343.81	-111.25	
20,756.00	89.94	359.32	11,898.78	8,283.81 N	1,032.67 W	512,798.21	725,488.63	0.28	8,345.80	-152.49	
20,758.00	89.94	359.34	11,898.78	8,285.81 N	1,032.69 W	512,800.21	725,488.61	0.88	8,347.79	94.14	
20,760.00	89.94	359.35	11,898.78	8,287.81 N	1,032.71 W	512,802.21	725,488.59	0.88	8,349.79	94.14	
20,762.00	89.94	359.37	11,898.78	8,289.81 N	1,032.74 W	512,804.21	725,488.56	0.88	8,351.78	94.14	
20,764.00	89.93	359.39	11,898.79	8,291.81 N	1,032.76 W	512,806.21	725,488.54	0.88	8,353.77	94.14	
20,766.00	89.93	359.41	11,898.79	8,293.81 N	1,032.78 W	512,808.21	725,488.52	0.88	8,355.76	94.14	
20,768.00	89.93	359.42	11,898.79	8,295.81 N	1,032.80 W	512,810.21	725,488.50	0.88	8,357.75	94.14	
20,770.00	89.93	359.44	11,898.79	8,297.81 N	1,032.82 W	512,812.21	725,488.48	0.88	8,359.74	94.14	
20,772.00	89.93	359.46	11,898.80	8,299.81 N	1,032.84 W	512,814.21	725,488.46	0.88	8,361.74	94.14	
20,774.00	89.93	359.48	11,898.80	8,301.81 N	1,032.86 W	512,816.21	725,488.44	0.88	8,363.73	94.14	
20,776.00	89.93	359.49	11,898.80	8,303.81 N	1,032.87 W	512,818.21	725,488.43	0.88	8,365.72	94.14	
20,778.00	89.93	359.51	11,898.80	8,305.81 N	1,032.89 W	512,820.21	725,488.41	0.88	8,367.71	94.14	
20,780.00	89.92	359.53	11,898.81	8,307.81 N	1,032.91 W	512,822.21	725,488.39	0.88	8,369.70	94.14	
20,782.00	89.92	359.55	11,898.81	8,309.81 N	1,032.92 W	512,824.21	725,488.38	0.88	8,371.69	94.13	
20,784.00	89.92	359.56	11,898.81	8,311.81 N	1,032.94 W	512,826.21	725,488.36	0.88	8,373.68	94.13	
20,786.00	89.92	359.58	11,898.81	8,313.81 N	1,032.96 W	512,828.21	725,488.34	0.88	8,375.67	94.13	
20,788.00	89.92	359.60	11,898.82	8,315.81 N	1,032.97 W	512,830.21	725,488.33	0.88	8,377.67	94.13	
20,790.00	89.92	359.62	11,898.82	8,317.81 N	1,032.98 W	512,832.21	725,488.32	0.88	8,379.66	94.13	
20,792.00	89.92	359.63	11,898.82	8,319.81 N	1,033.00 W	512,834.21	725,488.30	0.88	8,381.65	94.13	
20,794.00	89.92	359.65	11,898.83	8,321.81 N	1,033.01 W	512,836.21	725,488.29	0.88	8,383.64	94.13	
20,796.00	89.91	359.67	11,898.83	8,323.81 N	1,033.02 W	512,838.21	725,488.28	0.88	8,385.63	94.13	
20,798.00	89.91	359.69	11,898.83	8,325.81 N	1,033.03 W	512,840.21	725,488.27	0.88	8,387.62	94.13	
20,800.00	89.91	359.70	11,898.83	8,327.81 N	1,033.04 W	512,842.21	725,488.26	0.88	8,389.61	94.13	
20,802.00	89.91	359.72	11,898.84	8,329.81 N	1,033.05 W	512,844.21	725,488.25	0.88	8,391.60	94.13	
20,804.00	89.91	359.74	11,898.84	8,331.81 N	1,033.06 W	512,846.21	725,488.24	0.88	8,393.59	94.13	
20,806.00	89.91	359.76	11,898.84	8,333.81 N	1,033.07 W	512,848.21	725,488.23	0.88	8,395.58	94.13	
20,808.00	89.91	359.77	11,898.85	8,335.81 N	1,033.08 W	512,850.21	725,488.22	0.88	8,397.57	94.13	
20,810.00	89.91	359.79	11,898.85	8,337.81 N	1,033.09 W	512,852.21	725,488.21	0.88	8,399.56	94.13	
20,812.00	89.90	359.81	11,898.85	8,339.81 N	1,033.09 W	512,854.21	725,488.21	0.88	8,401.55	94.13	
20,814.00	89.90	359.83	11,898.86	8,341.81 N	1,033.10 W	512,856.21	725,488.20	0.88	8,403.55	94.13	
20,816.00	89.90	359.84	11,898.86	8,343.81 N	1,033.11 W	512,858.21	725,488.19	0.88	8,405.54	94.13	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
20,818.00	89.90	359.86	11,898.86	8,345.81 N	1,033.11 W	512,860.21	725,488.19	0.88	8,407.53	94.13	
20,820.00	89.90	359.88	11,898.87	8,347.81 N	1,033.12 W	512,862.21	725,488.18	0.88	8,409.52	94.13	
20,822.00	89.90	359.90	11,898.87	8,349.81 N	1,033.12 W	512,864.21	725,488.18	0.88	8,411.51	94.13	
20,824.00	89.90	359.91	11,898.88	8,351.81 N	1,033.12 W	512,866.21	725,488.18	0.88	8,413.50	94.13	
20,826.00	89.90	359.93	11,898.88	8,353.81 N	1,033.13 W	512,868.21	725,488.17	0.88	8,415.49	94.13	
20,828.00	89.89	359.95	11,898.88	8,355.81 N	1,033.13 W	512,870.21	725,488.17	0.88	8,417.48	94.13	
20,830.00	89.89	359.97	11,898.89	8,357.81 N	1,033.13 W	512,872.21	725,488.17	0.88	8,419.47	94.13	
20,832.00	89.89	359.98	11,898.89	8,359.81 N	1,033.13 W	512,874.21	725,488.17	0.88	8,421.46	94.13	
20,834.00	89.89	0.00	11,898.89	8,361.81 N	1,033.13 W	512,876.21	725,488.17	0.88	8,423.45	94.13	
20,836.00	89.89	0.02	11,898.90	8,363.81 N	1,033.13 W	512,878.21	725,488.17	0.88	8,425.44	94.13	
20,838.00	89.89	0.04	11,898.90	8,365.81 N	1,033.13 W	512,880.21	725,488.17	0.88	8,427.42	94.13	
20,840.00	89.89	0.05	11,898.91	8,367.81 N	1,033.13 W	512,882.21	725,488.17	0.88	8,429.41	94.13	
20,842.00	89.89	0.07	11,898.91	8,369.81 N	1,033.13 W	512,884.21	725,488.17	0.88	8,431.40	94.13	
20,844.00	89.88	0.09	11,898.91	8,371.81 N	1,033.12 W	512,886.21	725,488.18	0.88	8,433.39	94.13	
20,846.00	89.88	0.11	11,898.92	8,373.81 N	1,033.12 W	512,888.21	725,488.18	0.88	8,435.38	94.13	
20,848.00	89.88	0.12	11,898.92	8,375.81 N	1,033.12 W	512,890.21	725,488.18	0.88	8,437.37	94.13	
20,850.00	89.88	0.14	11,898.93	8,377.81 N	1,033.11 W	512,892.21	725,488.19	0.88	8,439.36	94.13	
20,852.00	89.90	0.14	11,898.93	8,379.81 N	1,033.11 W	512,894.21	725,488.19	1.02	8,441.35	-11.43	
20,854.00	89.92	0.13	11,898.93	8,381.81 N	1,033.10 W	512,896.21	725,488.20	1.02	8,443.34	-11.43	
20,856.00	89.94	0.13	11,898.94	8,383.81 N	1,033.10 W	512,898.21	725,488.20	1.02	8,445.33	-11.43	
20,858.00	89.96	0.12	11,898.94	8,385.81 N	1,033.09 W	512,900.21	725,488.21	1.02	8,447.32	-11.43	
20,860.00	89.98	0.12	11,898.94	8,387.81 N	1,033.09 W	512,902.21	725,488.21	1.02	8,449.31	-11.43	
20,862.00	90.00	0.12	11,898.94	8,389.81 N	1,033.08 W	512,904.21	725,488.22	1.02	8,451.30	-11.43	
20,864.00	90.02	0.11	11,898.94	8,391.81 N	1,033.08 W	512,906.21	725,488.22	1.02	8,453.29	-11.43	
20,866.00	90.04	0.11	11,898.94	8,393.81 N	1,033.08 W	512,908.21	725,488.22	1.02	8,455.28	-11.43	
20,868.00	90.06	0.10	11,898.94	8,395.81 N	1,033.07 W	512,910.21	725,488.23	1.02	8,457.26	-11.43	
20,870.00	90.08	0.10	11,898.93	8,397.81 N	1,033.07 W	512,912.21	725,488.23	1.02	8,459.25	-11.43	
20,872.00	90.10	0.10	11,898.93	8,399.81 N	1,033.07 W	512,914.21	725,488.23	1.02	8,461.24	-11.43	
20,874.00	90.12	0.09	11,898.93	8,401.81 N	1,033.06 W	512,916.21	725,488.24	1.02	8,463.23	-11.43	
20,876.00	90.14	0.09	11,898.92	8,403.81 N	1,033.06 W	512,918.21	725,488.24	1.02	8,465.22	-11.43	
20,878.00	90.16	0.08	11,898.92	8,405.81 N	1,033.06 W	512,920.21	725,488.24	1.02	8,467.21	-11.43	
20,880.00	90.18	0.08	11,898.91	8,407.81 N	1,033.05 W	512,922.21	725,488.25	1.02	8,469.20	-11.43	
20,882.00	90.20	0.08	11,898.90	8,409.81 N	1,033.05 W	512,924.21	725,488.25	1.02	8,471.19	-11.43	
20,884.00	90.22	0.07	11,898.90	8,411.81 N	1,033.05 W	512,926.21	725,488.25	1.02	8,473.18	-11.43	
20,886.00	90.24	0.07	11,898.89	8,413.81 N	1,033.05 W	512,928.21	725,488.25	1.02	8,475.17	-11.43	
20,888.00	90.26	0.06	11,898.88	8,415.81 N	1,033.04 W	512,930.21	725,488.26	1.02	8,477.16	-11.43	
20,890.00	90.28	0.06	11,898.87	8,417.81 N	1,033.04 W	512,932.21	725,488.26	1.02	8,479.15	-11.43	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
20,892.00	90.30	0.06	11,898.86	8,419.81 N	1,033.04 W	512,934.21	725,488.26	1.02	8,481.14	-11.43	
20,894.00	90.32	0.05	11,898.85	8,421.81 N	1,033.04 W	512,936.21	725,488.26	1.02	8,483.13	-11.43	
20,896.00	90.34	0.05	11,898.84	8,423.81 N	1,033.04 W	512,938.21	725,488.26	1.02	8,485.12	-11.43	
20,898.00	90.36	0.04	11,898.83	8,425.81 N	1,033.03 W	512,940.21	725,488.27	1.02	8,487.11	-11.43	
20,900.00	90.38	0.04	11,898.81	8,427.81 N	1,033.03 W	512,942.21	725,488.27	1.02	8,489.10	-11.43	
20,902.00	90.40	0.03	11,898.80	8,429.81 N	1,033.03 W	512,944.21	725,488.27	1.02	8,491.09	-11.43	
20,904.00	90.42	0.03	11,898.78	8,431.81 N	1,033.03 W	512,946.21	725,488.27	1.02	8,493.07	-11.43	
20,906.00	90.44	0.03	11,898.77	8,433.81 N	1,033.03 W	512,948.21	725,488.27	1.02	8,495.06	-11.43	
20,908.00	90.46	0.02	11,898.75	8,435.81 N	1,033.03 W	512,950.21	725,488.27	1.02	8,497.05	-11.43	
20,910.00	90.48	0.02	11,898.74	8,437.81 N	1,033.03 W	512,952.21	725,488.27	1.02	8,499.04	-11.43	
20,912.00	90.50	0.01	11,898.72	8,439.81 N	1,033.03 W	512,954.21	725,488.27	1.02	8,501.03	-11.43	
20,914.00	90.52	0.01	11,898.70	8,441.81 N	1,033.03 W	512,956.21	725,488.27	1.02	8,503.02	-11.43	
20,916.00	90.54	0.01	11,898.68	8,443.81 N	1,033.03 W	512,958.21	725,488.27	1.02	8,505.01	-11.43	
20,918.00	90.56	0.00	11,898.66	8,445.81 N	1,033.03 W	512,960.21	725,488.27	1.02	8,507.00	-11.43	
20,920.00	90.58	360.00	11,898.64	8,447.81 N	1,033.03 W	512,962.21	725,488.27	1.02	8,508.99	-11.43	
20,922.00	90.60	359.99	11,898.62	8,449.81 N	1,033.03 W	512,964.21	725,488.27	1.02	8,510.98	-11.43	
20,924.00	90.62	359.99	11,898.60	8,451.81 N	1,033.03 W	512,966.21	725,488.27	1.02	8,512.97	-11.43	
20,926.00	90.64	359.99	11,898.58	8,453.81 N	1,033.03 W	512,968.21	725,488.27	1.02	8,514.96	-11.43	
20,928.00	90.66	359.98	11,898.56	8,455.81 N	1,033.03 W	512,970.21	725,488.27	1.02	8,516.95	-11.43	
20,930.00	90.68	359.98	11,898.53	8,457.81 N	1,033.03 W	512,972.21	725,488.27	1.02	8,518.94	-11.43	
20,932.00	90.70	359.97	11,898.51	8,459.81 N	1,033.03 W	512,974.21	725,488.27	1.02	8,520.93	-11.43	
20,934.00	90.72	359.97	11,898.49	8,461.81 N	1,033.03 W	512,976.21	725,488.27	1.02	8,522.92	-11.43	
20,936.00	90.74	359.97	11,898.46	8,463.81 N	1,033.03 W	512,978.21	725,488.27	1.02	8,524.91	-11.43	
20,938.00	90.76	359.96	11,898.43	8,465.81 N	1,033.03 W	512,980.21	725,488.27	1.02	8,526.90	-11.43	
20,940.00	90.78	359.96	11,898.41	8,467.81 N	1,033.03 W	512,982.21	725,488.27	1.02	8,528.89	-11.43	
20,942.00	90.80	359.95	11,898.38	8,469.81 N	1,033.04 W	512,984.21	725,488.26	1.02	8,530.88	-11.43	
20,944.00	90.82	359.95	11,898.35	8,471.81 N	1,033.04 W	512,986.21	725,488.26	1.02	8,532.87	-11.43	
20,946.00	90.83	359.96	11,898.32	8,473.81 N	1,033.04 W	512,988.21	725,488.26	0.64	8,534.86	45.32	
20,948.00	90.84	359.97	11,898.29	8,475.81 N	1,033.04 W	512,990.21	725,488.26	0.64	8,536.85	45.32	
20,950.00	90.85	359.98	11,898.26	8,477.81 N	1,033.04 W	512,992.21	725,488.26	0.64	8,538.84	45.32	
20,952.00	90.86	359.99	11,898.23	8,479.81 N	1,033.04 W	512,994.21	725,488.26	0.64	8,540.83	45.32	
20,954.00	90.87	360.00	11,898.20	8,481.81 N	1,033.04 W	512,996.21	725,488.26	0.64	8,542.82	45.32	
20,956.00	90.87	0.00	11,898.17	8,483.81 N	1,033.04 W	512,998.21	725,488.26	0.64	8,544.81	45.32	
20,958.00	90.88	0.01	11,898.14	8,485.81 N	1,033.04 W	513,000.21	725,488.26	0.64	8,546.79	45.32	
20,960.00	90.89	0.02	11,898.11	8,487.80 N	1,033.04 W	513,002.20	725,488.26	0.64	8,548.78	45.32	
20,962.00	90.90	0.03	11,898.08	8,489.80 N	1,033.04 W	513,004.20	725,488.26	0.64	8,550.77	45.32	

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Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
20,964.00	90.91	0.04	11,898.05	8,491.80 N	1,033.04 W	513,006.20	725,488.26	0.64	8,552.76	45.32	
20,966.00	90.92	0.05	11,898.02	8,493.80 N	1,033.04 W	513,008.20	725,488.26	0.64	8,554.75	45.32	
20,968.00	90.93	0.06	11,897.99	8,495.80 N	1,033.04 W	513,010.20	725,488.26	0.64	8,556.74	45.32	
20,970.00	90.94	0.07	11,897.95	8,497.80 N	1,033.03 W	513,012.20	725,488.27	0.64	8,558.73	45.32	
20,972.00	90.95	0.08	11,897.92	8,499.80 N	1,033.03 W	513,014.20	725,488.27	0.64	8,560.72	45.32	
20,974.00	90.96	0.09	11,897.89	8,501.80 N	1,033.03 W	513,016.20	725,488.27	0.64	8,562.71	45.32	
20,976.00	90.96	0.10	11,897.85	8,503.80 N	1,033.02 W	513,018.20	725,488.28	0.64	8,564.70	45.32	
20,978.00	90.97	0.11	11,897.82	8,505.80 N	1,033.02 W	513,020.20	725,488.28	0.64	8,566.69	45.32	
20,980.00	90.98	0.11	11,897.79	8,507.80 N	1,033.02 W	513,022.20	725,488.28	0.64	8,568.68	45.32	
20,982.00	90.99	0.12	11,897.75	8,509.80 N	1,033.01 W	513,024.20	725,488.29	0.64	8,570.67	45.32	
20,984.00	91.00	0.13	11,897.72	8,511.80 N	1,033.01 W	513,026.20	725,488.29	0.64	8,572.65	45.32	
20,986.00	91.01	0.14	11,897.68	8,513.80 N	1,033.00 W	513,028.20	725,488.30	0.64	8,574.64	45.32	
20,988.00	91.02	0.15	11,897.65	8,515.80 N	1,033.00 W	513,030.20	725,488.30	0.64	8,576.63	45.32	
20,990.00	91.03	0.16	11,897.61	8,517.80 N	1,032.99 W	513,032.20	725,488.31	0.64	8,578.62	45.32	
20,992.00	91.04	0.17	11,897.57	8,519.80 N	1,032.99 W	513,034.20	725,488.31	0.64	8,580.61	45.32	
20,994.00	91.05	0.18	11,897.54	8,521.80 N	1,032.98 W	513,036.20	725,488.32	0.64	8,582.60	45.32	
20,996.00	91.06	0.19	11,897.50	8,523.80 N	1,032.97 W	513,038.20	725,488.33	0.64	8,584.59	45.32	
20,998.00	91.06	0.20	11,897.46	8,525.80 N	1,032.97 W	513,040.20	725,488.33	0.64	8,586.58	45.32	
21,000.00	91.07	0.21	11,897.43	8,527.80 N	1,032.96 W	513,042.20	725,488.34	0.64	8,588.56	45.32	
21,002.00	91.08	0.22	11,897.39	8,529.80 N	1,032.95 W	513,044.20	725,488.35	0.64	8,590.55	45.32	
21,004.00	91.09	0.22	11,897.35	8,531.80 N	1,032.95 W	513,046.20	725,488.35	0.64	8,592.54	45.32	
21,006.00	91.10	0.23	11,897.31	8,533.80 N	1,032.94 W	513,048.20	725,488.36	0.64	8,594.53	45.32	
21,008.00	91.11	0.24	11,897.27	8,535.80 N	1,032.93 W	513,050.20	725,488.37	0.64	8,596.52	45.32	
21,010.00	91.12	0.25	11,897.24	8,537.80 N	1,032.92 W	513,052.20	725,488.38	0.64	8,598.51	45.32	
21,012.00	91.13	0.26	11,897.20	8,539.80 N	1,032.91 W	513,054.20	725,488.39	0.64	8,600.50	45.32	
21,014.00	91.14	0.27	11,897.16	8,541.80 N	1,032.90 W	513,056.20	725,488.40	0.64	8,602.48	45.32	
21,016.00	91.15	0.28	11,897.12	8,543.80 N	1,032.89 W	513,058.20	725,488.41	0.64	8,604.47	45.32	
21,018.00	91.15	0.29	11,897.08	8,545.80 N	1,032.88 W	513,060.20	725,488.42	0.64	8,606.46	45.32	
21,020.00	91.16	0.30	11,897.04	8,547.79 N	1,032.87 W	513,062.19	725,488.43	0.64	8,608.45	45.32	
21,022.00	91.17	0.31	11,897.00	8,549.79 N	1,032.86 W	513,064.19	725,488.44	0.64	8,610.44	45.32	
21,024.00	91.18	0.32	11,896.95	8,551.79 N	1,032.85 W	513,066.19	725,488.45	0.64	8,612.42	45.32	
21,026.00	91.19	0.33	11,896.91	8,553.79 N	1,032.84 W	513,068.19	725,488.46	0.64	8,614.41	45.32	
21,028.00	91.20	0.33	11,896.87	8,555.79 N	1,032.83 W	513,070.19	725,488.47	0.64	8,616.40	45.32	
21,030.00	91.21	0.34	11,896.83	8,557.79 N	1,032.82 W	513,072.19	725,488.48	0.64	8,618.39	45.32	
21,032.00	91.22	0.35	11,896.79	8,559.79 N	1,032.80 W	513,074.19	725,488.50	0.64	8,620.38	45.32	
21,034.00	91.23	0.36	11,896.74	8,561.79 N	1,032.79 W	513,076.19	725,488.51	0.64	8,622.37	45.32	
21,036.00	91.24	0.37	11,896.70	8,563.79 N	1,032.78 W	513,078.19	725,488.52	0.64	8,624.35	45.32	

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Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
21,038.00	91.25	0.38	11,896.66	8,565.79 N	1,032.77 W	513,080.19	725,488.53	0.64	8,626.34	45.32	
21,040.00	91.25	0.39	11,896.61	8,567.79 N	1,032.75 W	513,082.19	725,488.55	0.64	8,628.33	45.32	
21,042.00	91.26	0.40	11,896.57	8,569.79 N	1,032.74 W	513,084.19	725,488.56	0.64	8,630.32	45.32	
21,044.00	91.27	0.41	11,896.53	8,571.79 N	1,032.73 W	513,086.19	725,488.57	0.64	8,632.30	45.32	
21,046.00	91.28	0.42	11,896.48	8,573.79 N	1,032.71 W	513,088.19	725,488.59	0.64	8,634.29	45.32	
21,048.00	91.29	0.43	11,896.44	8,575.79 N	1,032.70 W	513,090.19	725,488.60	0.64	8,636.28	45.32	
21,050.00	91.30	0.44	11,896.39	8,577.79 N	1,032.68 W	513,092.19	725,488.62	0.64	8,638.27	45.32	
21,052.00	91.31	0.44	11,896.35	8,579.79 N	1,032.67 W	513,094.19	725,488.63	0.64	8,640.25	45.32	
21,054.00	91.32	0.45	11,896.30	8,581.79 N	1,032.65 W	513,096.19	725,488.65	0.64	8,642.24	45.32	
21,056.00	91.33	0.46	11,896.25	8,583.79 N	1,032.63 W	513,098.19	725,488.67	0.64	8,644.23	45.33	
21,058.00	91.34	0.47	11,896.21	8,585.78 N	1,032.62 W	513,100.18	725,488.68	0.64	8,646.22	45.33	
21,060.00	91.35	0.48	11,896.16	8,587.78 N	1,032.60 W	513,102.18	725,488.70	0.64	8,648.20	45.33	
21,062.00	91.35	0.49	11,896.11	8,589.78 N	1,032.58 W	513,104.18	725,488.72	0.64	8,650.19	45.33	
21,064.00	91.36	0.50	11,896.07	8,591.78 N	1,032.57 W	513,106.18	725,488.73	0.64	8,652.18	45.33	
21,066.00	91.37	0.51	11,896.02	8,593.78 N	1,032.55 W	513,108.18	725,488.75	0.64	8,654.17	45.33	
21,068.00	91.38	0.52	11,895.97	8,595.78 N	1,032.53 W	513,110.18	725,488.77	0.64	8,656.15	45.33	
21,070.00	91.39	0.53	11,895.92	8,597.78 N	1,032.51 W	513,112.18	725,488.79	0.64	8,658.14	45.33	
21,072.00	91.40	0.54	11,895.87	8,599.78 N	1,032.49 W	513,114.18	725,488.81	0.64	8,660.13	45.33	
21,074.00	91.41	0.55	11,895.82	8,601.78 N	1,032.48 W	513,116.18	725,488.82	0.64	8,662.12	45.33	
21,076.00	91.42	0.55	11,895.77	8,603.78 N	1,032.46 W	513,118.18	725,488.84	0.64	8,664.10	45.33	
21,078.00	91.43	0.56	11,895.72	8,605.78 N	1,032.44 W	513,120.18	725,488.86	0.64	8,666.09	45.33	
21,080.00	91.44	0.57	11,895.67	8,607.78 N	1,032.42 W	513,122.18	725,488.88	0.64	8,668.08	45.33	
21,082.00	91.44	0.58	11,895.62	8,609.78 N	1,032.40 W	513,124.18	725,488.90	0.64	8,670.06	45.33	
21,084.00	91.45	0.59	11,895.57	8,611.78 N	1,032.38 W	513,126.18	725,488.92	0.64	8,672.05	45.33	
21,086.00	91.46	0.60	11,895.52	8,613.78 N	1,032.36 W	513,128.18	725,488.94	0.64	8,674.04	45.33	
21,088.00	91.47	0.61	11,895.47	8,615.77 N	1,032.33 W	513,130.17	725,488.97	0.64	8,676.02	45.33	
21,090.00	91.48	0.62	11,895.42	8,617.77 N	1,032.31 W	513,132.17	725,488.99	0.64	8,678.01	45.33	
21,092.00	91.49	0.63	11,895.37	8,619.77 N	1,032.29 W	513,134.17	725,489.01	0.64	8,680.00	45.33	
21,094.00	91.50	0.64	11,895.32	8,621.77 N	1,032.27 W	513,136.17	725,489.03	0.64	8,681.98	45.33	
21,096.00	91.51	0.65	11,895.26	8,623.77 N	1,032.25 W	513,138.17	725,489.05	0.64	8,683.97	45.33	
21,098.00	91.52	0.66	11,895.21	8,625.77 N	1,032.22 W	513,140.17	725,489.08	0.64	8,685.96	45.33	
21,100.00	91.53	0.66	11,895.16	8,627.77 N	1,032.20 W	513,142.17	725,489.10	0.64	8,687.94	45.33	
21,102.00	91.54	0.67	11,895.10	8,629.77 N	1,032.18 W	513,144.17	725,489.12	0.64	8,689.93	45.33	
21,104.00	91.54	0.68	11,895.05	8,631.77 N	1,032.15 W	513,146.17	725,489.15	0.64	8,691.92	45.33	
21,106.00	91.55	0.69	11,895.00	8,633.77 N	1,032.13 W	513,148.17	725,489.17	0.64	8,693.90	45.33	
21,108.00	91.56	0.70	11,894.94	8,635.77 N	1,032.11 W	513,150.17	725,489.19	0.64	8,695.89	45.33	
21,110.00	91.57	0.71	11,894.89	8,637.77 N	1,032.08 W	513,152.17	725,489.22	0.64	8,697.88	45.33	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
21,112.00	91.58	0.72	11,894.83	8,639.76 N	1,032.06 W	513,154.16	725,489.24	0.64	8,699.86	45.33	
21,114.00	91.59	0.73	11,894.78	8,641.76 N	1,032.03 W	513,156.16	725,489.27	0.64	8,701.85	45.33	
21,116.00	91.60	0.74	11,894.72	8,643.76 N	1,032.01 W	513,158.16	725,489.29	0.64	8,703.84	45.33	
21,118.00	91.61	0.75	11,894.67	8,645.76 N	1,031.98 W	513,160.16	725,489.32	0.64	8,705.82	45.33	
21,120.00	91.62	0.76	11,894.61	8,647.76 N	1,031.95 W	513,162.16	725,489.35	0.64	8,707.81	45.33	
21,122.00	91.63	0.77	11,894.55	8,649.76 N	1,031.93 W	513,164.16	725,489.37	0.64	8,709.79	45.33	
21,124.00	91.63	0.77	11,894.50	8,651.76 N	1,031.90 W	513,166.16	725,489.40	0.64	8,711.78	45.33	
21,126.00	91.64	0.78	11,894.44	8,653.76 N	1,031.87 W	513,168.16	725,489.43	0.64	8,713.77	45.33	
21,128.00	91.65	0.79	11,894.38	8,655.76 N	1,031.85 W	513,170.16	725,489.45	0.64	8,715.75	45.33	
21,130.00	91.66	0.80	11,894.32	8,657.76 N	1,031.82 W	513,172.16	725,489.48	0.64	8,717.74	45.33	
21,132.00	91.67	0.81	11,894.27	8,659.75 N	1,031.79 W	513,174.15	725,489.51	0.64	8,719.72	45.33	
21,134.00	91.68	0.82	11,894.21	8,661.75 N	1,031.76 W	513,176.15	725,489.54	0.64	8,721.71	45.33	
21,136.00	91.66	0.79	11,894.15	8,663.75 N	1,031.73 W	513,178.15	725,489.57	1.96	8,723.69	-127.19	
21,138.00	91.63	0.76	11,894.09	8,665.75 N	1,031.71 W	513,180.15	725,489.59	1.96	8,725.68	-127.19	
21,140.00	91.61	0.73	11,894.03	8,667.75 N	1,031.68 W	513,182.15	725,489.62	1.96	8,727.67	-127.19	
21,142.00	91.59	0.70	11,893.98	8,669.75 N	1,031.66 W	513,184.15	725,489.64	1.96	8,729.65	-127.19	
21,144.00	91.56	0.66	11,893.92	8,671.75 N	1,031.63 W	513,186.15	725,489.67	1.96	8,731.64	-127.19	
21,146.00	91.54	0.63	11,893.87	8,673.75 N	1,031.61 W	513,188.15	725,489.69	1.96	8,733.63	-127.19	
21,148.00	91.51	0.60	11,893.82	8,675.75 N	1,031.59 W	513,190.15	725,489.71	1.96	8,735.61	-127.19	
21,150.00	91.49	0.57	11,893.76	8,677.75 N	1,031.57 W	513,192.15	725,489.73	1.96	8,737.60	-127.20	
21,152.00	91.47	0.54	11,893.71	8,679.75 N	1,031.55 W	513,194.15	725,489.75	1.96	8,739.59	-127.20	
21,154.00	91.44	0.51	11,893.66	8,681.74 N	1,031.53 W	513,196.14	725,489.77	1.96	8,741.57	-127.20	
21,156.00	91.42	0.48	11,893.61	8,683.74 N	1,031.51 W	513,198.14	725,489.79	1.96	8,743.56	-127.20	
21,158.00	91.40	0.45	11,893.56	8,685.74 N	1,031.50 W	513,200.14	725,489.80	1.96	8,745.55	-127.20	
21,160.00	91.37	0.41	11,893.51	8,687.74 N	1,031.48 W	513,202.14	725,489.82	1.96	8,747.54	-127.20	
21,162.00	91.35	0.38	11,893.47	8,689.74 N	1,031.47 W	513,204.14	725,489.83	1.96	8,749.52	-127.20	
21,164.00	91.32	0.35	11,893.42	8,691.74 N	1,031.45 W	513,206.14	725,489.85	1.96	8,751.51	-127.20	
21,166.00	91.30	0.32	11,893.37	8,693.74 N	1,031.44 W	513,208.14	725,489.86	1.96	8,753.50	-127.20	
21,168.00	91.28	0.29	11,893.33	8,695.74 N	1,031.43 W	513,210.14	725,489.87	1.96	8,755.49	-127.20	
21,170.00	91.25	0.26	11,893.29	8,697.74 N	1,031.42 W	513,212.14	725,489.88	1.96	8,757.48	-127.20	
21,172.00	91.23	0.23	11,893.24	8,699.74 N	1,031.41 W	513,214.14	725,489.89	1.96	8,759.46	-127.20	
21,174.00	91.21	0.20	11,893.20	8,701.74 N	1,031.41 W	513,216.14	725,489.89	1.96	8,761.45	-127.20	
21,176.00	91.18	0.16	11,893.16	8,703.74 N	1,031.40 W	513,218.14	725,489.90	1.96	8,763.44	-127.20	
21,178.00	91.16	0.13	11,893.12	8,705.74 N	1,031.40 W	513,220.14	725,489.90	1.96	8,765.43	-127.21	
21,180.00	91.13	0.10	11,893.08	8,707.74 N	1,031.39 W	513,222.14	725,489.91	1.96	8,767.42	-127.21	
21,182.00	91.11	0.07	11,893.04	8,709.74 N	1,031.39 W	513,224.14	725,489.91	1.96	8,769.41	-127.21	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
21,184.00	91.09	0.04	11,893.00	8,711.74 N	1,031.39 W	513,226.14	725,489.91	1.96	8,771.40	-127.21	
21,186.00	91.06	0.01	11,892.96	8,713.74 N	1,031.39 W	513,228.14	725,489.91	1.96	8,773.39	-127.21	
21,188.00	91.04	359.98	11,892.93	8,715.74 N	1,031.39 W	513,230.14	725,489.91	1.96	8,775.38	-127.21	
21,190.00	91.02	359.95	11,892.89	8,717.74 N	1,031.39 W	513,232.14	725,489.91	1.96	8,777.37	-127.21	
21,192.00	90.99	359.91	11,892.85	8,719.74 N	1,031.39 W	513,234.14	725,489.91	1.96	8,779.36	-127.21	
21,194.00	90.97	359.88	11,892.82	8,721.74 N	1,031.39 W	513,236.14	725,489.91	1.96	8,781.35	-127.21	
21,196.00	90.95	359.85	11,892.79	8,723.74 N	1,031.40 W	513,238.14	725,489.90	1.96	8,783.33	-127.21	
21,198.00	90.92	359.82	11,892.75	8,725.73 N	1,031.40 W	513,240.13	725,489.90	1.96	8,785.32	-127.21	
21,200.00	90.90	359.79	11,892.72	8,727.73 N	1,031.41 W	513,242.13	725,489.89	1.96	8,787.32	-127.21	
21,202.00	90.87	359.76	11,892.69	8,729.73 N	1,031.42 W	513,244.13	725,489.88	1.96	8,789.31	-127.21	
21,204.00	90.85	359.73	11,892.66	8,731.73 N	1,031.43 W	513,246.13	725,489.87	1.96	8,791.30	-127.21	
21,206.00	90.83	359.70	11,892.63	8,733.73 N	1,031.44 W	513,248.13	725,489.86	1.96	8,793.29	-127.21	
21,208.00	90.80	359.66	11,892.60	8,735.73 N	1,031.45 W	513,250.13	725,489.85	1.96	8,795.28	-127.21	
21,210.00	90.78	359.63	11,892.58	8,737.73 N	1,031.46 W	513,252.13	725,489.84	1.96	8,797.27	-127.21	
21,212.00	90.76	359.60	11,892.55	8,739.73 N	1,031.47 W	513,254.13	725,489.83	1.96	8,799.26	-127.21	
21,214.00	90.73	359.57	11,892.52	8,741.73 N	1,031.49 W	513,256.13	725,489.81	1.96	8,801.25	-127.22	
21,216.00	90.71	359.54	11,892.50	8,743.73 N	1,031.50 W	513,258.13	725,489.80	1.96	8,803.24	-127.22	
21,218.00	90.68	359.51	11,892.47	8,745.73 N	1,031.52 W	513,260.13	725,489.78	1.96	8,805.23	-127.22	
21,220.00	90.66	359.48	11,892.45	8,747.73 N	1,031.54 W	513,262.13	725,489.76	1.96	8,807.22	-127.22	
21,222.00	90.64	359.45	11,892.43	8,749.73 N	1,031.56 W	513,264.13	725,489.74	1.96	8,809.21	-127.22	
21,224.00	90.61	359.41	11,892.41	8,751.73 N	1,031.58 W	513,266.13	725,489.72	1.96	8,811.21	-127.22	
21,226.00	90.59	359.38	11,892.38	8,753.73 N	1,031.60 W	513,268.13	725,489.70	1.96	8,813.20	-127.22	
21,228.00	90.57	359.35	11,892.36	8,755.73 N	1,031.62 W	513,270.13	725,489.68	1.96	8,815.19	-127.22	
21,230.00	90.54	359.32	11,892.34	8,757.73 N	1,031.64 W	513,272.13	725,489.66	1.96	8,817.18	-127.22	
21,232.00	90.52	359.29	11,892.33	8,759.73 N	1,031.67 W	513,274.13	725,489.63	1.96	8,819.17	-127.22	
21,234.00	90.49	359.26	11,892.31	8,761.73 N	1,031.69 W	513,276.13	725,489.61	1.96	8,821.17	-127.22	
21,236.00	90.47	359.23	11,892.29	8,763.73 N	1,031.72 W	513,278.13	725,489.58	1.96	8,823.16	-127.22	
21,238.00	90.45	359.20	11,892.28	8,765.73 N	1,031.75 W	513,280.13	725,489.55	1.96	8,825.15	-127.22	
21,240.00	90.42	359.17	11,892.26	8,767.73 N	1,031.78 W	513,282.13	725,489.52	1.96	8,827.14	-127.22	
21,242.00	90.40	359.13	11,892.25	8,769.73 N	1,031.80 W	513,284.13	725,489.50	1.96	8,829.13	-127.22	
21,244.00	90.38	359.10	11,892.23	8,771.73 N	1,031.84 W	513,286.13	725,489.46	1.96	8,831.13	-127.22	
21,246.00	90.35	359.07	11,892.22	8,773.73 N	1,031.87 W	513,288.13	725,489.43	1.96	8,833.12	-127.22	
21,248.00	90.33	359.04	11,892.21	8,775.73 N	1,031.90 W	513,290.13	725,489.40	1.96	8,835.11	-127.22	
21,250.00	90.31	359.01	11,892.20	8,777.73 N	1,031.93 W	513,292.13	725,489.37	1.96	8,837.11	-127.22	
21,252.00	90.28	358.98	11,892.19	8,779.73 N	1,031.97 W	513,294.13	725,489.33	1.96	8,839.10	-127.22	
21,254.00	90.26	358.95	11,892.18	8,781.73 N	1,032.01 W	513,296.13	725,489.29	1.96	8,841.09	-127.22	
21,256.00	90.23	358.92	11,892.17	8,783.73 N	1,032.04 W	513,298.13	725,489.26	1.96	8,843.08	-127.22	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
21,258.00	90.21	358.88	11,892.16	8,785.73 N	1,032.08 W	513,300.13	725,489.22	1.96	8,845.08	-127.22	
21,260.00	90.19	358.85	11,892.15	8,787.73 N	1,032.12 W	513,302.13	725,489.18	1.96	8,847.07	-127.22	
21,262.00	90.16	358.82	11,892.15	8,789.73 N	1,032.16 W	513,304.13	725,489.14	1.96	8,849.06	-127.22	
21,264.00	90.14	358.79	11,892.14	8,791.73 N	1,032.20 W	513,306.13	725,489.10	1.96	8,851.06	-127.22	
21,266.00	90.12	358.76	11,892.14	8,793.73 N	1,032.25 W	513,308.13	725,489.05	1.96	8,853.05	-127.22	
21,268.00	90.09	358.73	11,892.13	8,795.72 N	1,032.29 W	513,310.12	725,489.01	1.96	8,855.04	-127.22	
21,270.00	90.07	358.70	11,892.13	8,797.72 N	1,032.33 W	513,312.12	725,488.97	1.96	8,857.04	-127.22	
21,272.00	90.04	358.67	11,892.13	8,799.72 N	1,032.38 W	513,314.12	725,488.92	1.96	8,859.03	-127.22	
21,274.00	90.02	358.63	11,892.13	8,801.72 N	1,032.43 W	513,316.12	725,488.87	1.96	8,861.03	-127.22	
21,276.00	90.00	358.60	11,892.13	8,803.72 N	1,032.48 W	513,318.12	725,488.82	1.96	8,863.02	-127.22	
21,278.00	89.97	358.57	11,892.13	8,805.72 N	1,032.53 W	513,320.12	725,488.77	1.96	8,865.01	-127.22	
21,280.00	89.95	358.54	11,892.13	8,807.72 N	1,032.58 W	513,322.12	725,488.72	1.96	8,867.01	-127.22	
21,282.00	89.93	358.51	11,892.13	8,809.72 N	1,032.63 W	513,324.12	725,488.67	1.96	8,869.00	-127.22	
21,284.00	89.90	358.48	11,892.14	8,811.72 N	1,032.68 W	513,326.12	725,488.62	1.96	8,871.00	-127.22	
21,286.00	89.88	358.45	11,892.14	8,813.72 N	1,032.73 W	513,328.12	725,488.57	1.96	8,872.99	-127.22	
21,288.00	89.85	358.42	11,892.14	8,815.72 N	1,032.79 W	513,330.12	725,488.51	1.96	8,874.99	-127.22	
21,290.00	89.83	358.38	11,892.15	8,817.72 N	1,032.84 W	513,332.12	725,488.46	1.96	8,876.98	-127.22	
21,292.00	89.81	358.35	11,892.16	8,819.72 N	1,032.90 W	513,334.12	725,488.40	1.96	8,878.98	-127.22	
21,294.00	89.78	358.32	11,892.16	8,821.72 N	1,032.96 W	513,336.12	725,488.34	1.96	8,880.97	-127.22	
21,296.00	89.76	358.29	11,892.17	8,823.72 N	1,033.02 W	513,338.12	725,488.28	1.96	8,882.97	-127.22	
21,298.00	89.74	358.26	11,892.18	8,825.71 N	1,033.08 W	513,340.11	725,488.22	1.96	8,884.96	-127.22	
21,300.00	89.71	358.23	11,892.19	8,827.71 N	1,033.14 W	513,342.11	725,488.16	1.96	8,886.96	-127.22	
21,302.00	89.69	358.20	11,892.20	8,829.71 N	1,033.20 W	513,344.11	725,488.10	1.96	8,888.95	-127.22	
21,304.00	89.67	358.17	11,892.21	8,831.71 N	1,033.27 W	513,346.11	725,488.03	1.96	8,890.95	-127.22	
21,306.00	89.64	358.14	11,892.22	8,833.71 N	1,033.33 W	513,348.11	725,487.97	1.96	8,892.94	-127.22	
21,308.00	89.62	358.10	11,892.24	8,835.71 N	1,033.40 W	513,350.11	725,487.90	1.96	8,894.94	-127.22	
21,310.00	89.59	358.07	11,892.25	8,837.71 N	1,033.46 W	513,352.11	725,487.84	1.96	8,896.93	-127.22	
21,312.00	89.57	358.04	11,892.26	8,839.71 N	1,033.53 W	513,354.11	725,487.77	1.96	8,898.93	-127.22	
21,314.00	89.55	358.01	11,892.28	8,841.71 N	1,033.60 W	513,356.11	725,487.70	1.96	8,900.92	-127.22	
21,316.00	89.52	357.98	11,892.30	8,843.70 N	1,033.67 W	513,358.10	725,487.63	1.96	8,902.92	-127.22	
21,318.00	89.50	357.95	11,892.31	8,845.70 N	1,033.74 W	513,360.10	725,487.56	1.96	8,904.91	-127.22	
21,320.00	89.48	357.92	11,892.33	8,847.70 N	1,033.81 W	513,362.10	725,487.49	1.96	8,906.91	-127.22	
21,322.00	89.45	357.89	11,892.35	8,849.70 N	1,033.89 W	513,364.10	725,487.41	1.96	8,908.90	-127.22	
21,324.00	89.46	357.90	11,892.37	8,851.70 N	1,033.96 W	513,366.10	725,487.34	0.62	8,910.90	49.90	
21,326.00	89.50	357.95	11,892.39	8,853.70 N	1,034.03 W	513,368.10	725,487.27	3.21	8,912.90	51.66	
21,328.00	89.54	358.00	11,892.40	8,855.70 N	1,034.10 W	513,370.10	725,487.20	3.21	8,914.89	51.66	
21,330.00	89.58	358.05	11,892.42	8,857.69 N	1,034.17 W	513,372.09	725,487.13	3.21	8,916.89	51.66	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
21,332.00	89.62	358.10	11,892.43	8,859.69 N	1,034.24 W	513,374.09	725,487.06	3.21	8,918.88	51.66	
21,334.00	89.66	358.15	11,892.45	8,861.69 N	1,034.30 W	513,376.09	725,487.00	3.21	8,920.88	51.66	
21,336.00	89.70	358.20	11,892.46	8,863.69 N	1,034.37 W	513,378.09	725,486.93	3.21	8,922.87	51.66	
21,338.00	89.74	358.25	11,892.47	8,865.69 N	1,034.43 W	513,380.09	725,486.87	3.21	8,924.87	51.66	
21,340.00	89.78	358.30	11,892.48	8,867.69 N	1,034.49 W	513,382.09	725,486.81	3.21	8,926.86	51.66	
21,342.00	89.82	358.35	11,892.48	8,869.69 N	1,034.55 W	513,384.09	725,486.75	3.21	8,928.86	51.66	
21,344.00	89.86	358.40	11,892.49	8,871.69 N	1,034.61 W	513,386.09	725,486.69	3.21	8,930.85	51.66	
21,346.00	89.90	358.45	11,892.49	8,873.69 N	1,034.66 W	513,388.09	725,486.64	3.21	8,932.85	51.66	
21,348.00	89.94	358.50	11,892.50	8,875.69 N	1,034.71 W	513,390.09	725,486.59	3.21	8,934.84	51.66	
21,350.00	89.98	358.55	11,892.50	8,877.69 N	1,034.77 W	513,392.09	725,486.53	3.21	8,936.84	51.66	
21,352.00	90.02	358.60	11,892.50	8,879.68 N	1,034.82 W	513,394.08	725,486.48	3.21	8,938.83	51.66	
21,354.00	90.06	358.65	11,892.50	8,881.68 N	1,034.86 W	513,396.08	725,486.44	3.21	8,940.82	51.66	
21,356.00	90.10	358.70	11,892.49	8,883.68 N	1,034.91 W	513,398.08	725,486.39	3.21	8,942.82	51.66	
21,358.00	90.14	358.75	11,892.49	8,885.68 N	1,034.95 W	513,400.08	725,486.35	3.21	8,944.81	51.66	
21,360.00	90.18	358.80	11,892.48	8,887.68 N	1,035.00 W	513,402.08	725,486.30	3.21	8,946.80	51.66	
21,362.00	90.22	358.85	11,892.48	8,889.68 N	1,035.04 W	513,404.08	725,486.26	3.21	8,948.80	51.66	
21,364.00	90.26	358.90	11,892.47	8,891.68 N	1,035.08 W	513,406.08	725,486.22	3.21	8,950.79	51.66	
21,366.00	90.30	358.95	11,892.46	8,893.68 N	1,035.11 W	513,408.08	725,486.19	3.21	8,952.78	51.66	
21,368.00	90.34	359.00	11,892.45	8,895.68 N	1,035.15 W	513,410.08	725,486.15	3.21	8,954.78	51.66	
21,370.00	90.38	359.05	11,892.44	8,897.68 N	1,035.18 W	513,412.08	725,486.12	3.21	8,956.77	51.66	
21,372.00	90.41	359.10	11,892.42	8,899.68 N	1,035.22 W	513,414.08	725,486.08	3.21	8,958.76	51.66	
21,374.00	90.45	359.15	11,892.41	8,901.68 N	1,035.25 W	513,416.08	725,486.05	3.21	8,960.76	51.66	
21,376.00	90.49	359.20	11,892.39	8,903.68 N	1,035.28 W	513,418.08	725,486.02	3.21	8,962.75	51.66	
21,378.00	90.53	359.25	11,892.37	8,905.68 N	1,035.30 W	513,420.08	725,486.00	3.21	8,964.74	51.66	
21,380.00	90.57	359.30	11,892.35	8,907.68 N	1,035.33 W	513,422.08	725,485.97	3.21	8,966.73	51.66	
21,382.00	90.61	359.35	11,892.33	8,909.68 N	1,035.35 W	513,424.08	725,485.95	3.21	8,968.72	51.66	
21,384.00	90.65	359.40	11,892.31	8,911.68 N	1,035.37 W	513,426.08	725,485.93	3.21	8,970.72	51.66	
21,386.00	90.69	359.45	11,892.29	8,913.68 N	1,035.39 W	513,428.08	725,485.91	3.21	8,972.71	51.66	
21,388.00	90.73	359.51	11,892.26	8,915.68 N	1,035.41 W	513,430.08	725,485.89	3.21	8,974.70	51.66	
21,390.00	90.77	359.56	11,892.23	8,917.68 N	1,035.43 W	513,432.08	725,485.87	3.21	8,976.69	51.66	
21,392.00	90.81	359.61	11,892.21	8,919.68 N	1,035.44 W	513,434.08	725,485.86	3.21	8,978.68	51.66	
21,394.00	90.85	359.66	11,892.18	8,921.68 N	1,035.45 W	513,436.08	725,485.85	3.21	8,980.67	51.66	
21,396.00	90.89	359.71	11,892.15	8,923.68 N	1,035.47 W	513,438.08	725,485.83	3.21	8,982.66	51.66	
21,398.00	90.93	359.76	11,892.12	8,925.68 N	1,035.48 W	513,440.08	725,485.82	3.21	8,984.65	51.67	
21,400.00	90.97	359.81	11,892.08	8,927.68 N	1,035.48 W	513,442.08	725,485.82	3.21	8,986.64	51.67	
21,402.00	91.01	359.86	11,892.05	8,929.68 N	1,035.49 W	513,444.08	725,485.81	3.21	8,988.63	51.67	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
21,404.00	91.05	359.91	11,892.01	8,931.68 N	1,035.49 W	513,446.08	725,485.81	3.21	8,990.62	51.67	
21,406.00	91.09	359.96	11,891.97	8,933.68 N	1,035.50 W	513,448.08	725,485.80	3.21	8,992.61	51.67	
21,408.00	91.13	0.01	11,891.94	8,935.68 N	1,035.50 W	513,450.08	725,485.80	3.21	8,994.60	51.67	
21,410.00	91.17	0.06	11,891.90	8,937.68 N	1,035.49 W	513,452.08	725,485.81	3.21	8,996.59	51.67	
21,412.00	91.21	0.11	11,891.85	8,939.67 N	1,035.49 W	513,454.07	725,485.81	3.21	8,998.58	51.67	
21,414.00	91.25	0.16	11,891.81	8,941.67 N	1,035.49 W	513,456.07	725,485.81	3.21	9,000.57	51.67	
21,416.00	91.29	0.21	11,891.77	8,943.67 N	1,035.48 W	513,458.07	725,485.82	3.21	9,002.56	51.67	
21,418.00	91.33	0.26	11,891.72	8,945.67 N	1,035.47 W	513,460.07	725,485.83	3.21	9,004.54	51.67	
21,420.00	91.31	0.26	11,891.67	8,947.67 N	1,035.46 W	513,462.07	725,485.84	1.14	9,006.53	-176.29	
21,422.00	91.28	0.26	11,891.63	8,949.67 N	1,035.45 W	513,464.07	725,485.85	1.14	9,008.52	-176.29	
21,424.00	91.26	0.26	11,891.59	8,951.67 N	1,035.45 W	513,466.07	725,485.85	1.14	9,010.51	-176.29	
21,426.00	91.24	0.25	11,891.54	8,953.67 N	1,035.44 W	513,468.07	725,485.86	1.14	9,012.50	-176.29	
21,428.00	91.22	0.25	11,891.50	8,955.67 N	1,035.43 W	513,470.07	725,485.87	1.14	9,014.49	-176.29	
21,430.00	91.19	0.25	11,891.46	8,957.67 N	1,035.42 W	513,472.07	725,485.88	1.14	9,016.47	-176.29	
21,432.00	91.17	0.25	11,891.42	8,959.67 N	1,035.41 W	513,474.07	725,485.89	1.14	9,018.46	-176.29	
21,434.00	91.15	0.25	11,891.37	8,961.67 N	1,035.40 W	513,476.07	725,485.90	1.14	9,020.45	-176.29	
21,436.00	91.13	0.25	11,891.34	8,963.67 N	1,035.39 W	513,478.07	725,485.91	1.14	9,022.44	-176.29	
21,438.00	91.10	0.25	11,891.30	8,965.67 N	1,035.38 W	513,480.07	725,485.92	1.14	9,024.43	-176.29	
21,440.00	91.08	0.24	11,891.26	8,967.67 N	1,035.38 W	513,482.07	725,485.92	1.14	9,026.42	-176.29	
21,442.00	91.06	0.24	11,891.22	8,969.67 N	1,035.37 W	513,484.07	725,485.93	1.14	9,028.41	-176.29	
21,444.00	91.03	0.24	11,891.18	8,971.67 N	1,035.36 W	513,486.07	725,485.94	1.14	9,030.39	-176.29	
21,446.00	91.01	0.24	11,891.15	8,973.67 N	1,035.35 W	513,488.07	725,485.95	1.14	9,032.38	-176.29	
21,448.00	90.99	0.24	11,891.11	8,975.67 N	1,035.34 W	513,490.07	725,485.96	1.14	9,034.37	-176.29	
21,450.00	90.97	0.24	11,891.08	8,977.67 N	1,035.33 W	513,492.07	725,485.97	1.14	9,036.36	-176.29	
21,452.00	90.94	0.23	11,891.05	8,979.67 N	1,035.33 W	513,494.07	725,485.97	1.14	9,038.35	-176.29	
21,454.00	90.92	0.23	11,891.01	8,981.67 N	1,035.32 W	513,496.07	725,485.98	1.14	9,040.34	-176.29	
21,456.00	90.90	0.23	11,890.98	8,983.67 N	1,035.31 W	513,498.07	725,485.99	1.14	9,042.33	-176.29	
21,458.00	90.88	0.23	11,890.95	8,985.67 N	1,035.30 W	513,500.07	725,486.00	1.14	9,044.31	-176.29	
21,460.00	90.85	0.23	11,890.92	8,987.67 N	1,035.29 W	513,502.07	725,486.01	1.14	9,046.30	-176.29	
21,462.00	90.83	0.23	11,890.89	8,989.66 N	1,035.29 W	513,504.06	725,486.01	1.14	9,048.29	-176.29	
21,464.00	90.81	0.23	11,890.86	8,991.66 N	1,035.28 W	513,506.06	725,486.02	1.14	9,050.28	-176.29	
21,466.00	90.78	0.22	11,890.84	8,993.66 N	1,035.27 W	513,508.06	725,486.03	1.14	9,052.27	-176.29	
21,468.00	90.76	0.22	11,890.81	8,995.66 N	1,035.26 W	513,510.06	725,486.04	1.14	9,054.26	-176.29	
21,470.00	90.74	0.22	11,890.78	8,997.66 N	1,035.25 W	513,512.06	725,486.05	1.14	9,056.25	-176.29	
21,472.00	90.72	0.22	11,890.76	8,999.66 N	1,035.25 W	513,514.06	725,486.05	1.14	9,058.24	-176.29	
21,474.00	90.69	0.22	11,890.73	9,001.66 N	1,035.24 W	513,516.06	725,486.06	1.14	9,060.22	-176.29	
21,476.00	90.67	0.22	11,890.71	9,003.66 N	1,035.23 W	513,518.06	725,486.07	1.14	9,062.21	-176.29	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
21,478.00	90.65	0.22	11,890.69	9,005.66 N	1,035.22 W	513,520.06	725,486.08	1.14	9,064.20	-176.29	
21,480.00	90.63	0.21	11,890.66	9,007.66 N	1,035.22 W	513,522.06	725,486.08	1.14	9,066.19	-176.29	
21,482.00	90.60	0.21	11,890.64	9,009.66 N	1,035.21 W	513,524.06	725,486.09	1.14	9,068.18	-176.29	
21,484.00	90.58	0.21	11,890.62	9,011.66 N	1,035.20 W	513,526.06	725,486.10	1.14	9,070.17	-176.29	
21,486.00	90.56	0.21	11,890.60	9,013.66 N	1,035.19 W	513,528.06	725,486.11	1.14	9,072.16	-176.29	
21,488.00	90.53	0.21	11,890.58	9,015.66 N	1,035.19 W	513,530.06	725,486.11	1.14	9,074.15	-176.29	
21,490.00	90.51	0.21	11,890.56	9,017.66 N	1,035.18 W	513,532.06	725,486.12	1.14	9,076.13	-176.29	
21,492.00	90.49	0.21	11,890.55	9,019.66 N	1,035.17 W	513,534.06	725,486.13	1.14	9,078.12	-176.29	
21,494.00	90.47	0.20	11,890.53	9,021.66 N	1,035.16 W	513,536.06	725,486.14	1.14	9,080.11	-176.29	
21,496.00	90.44	0.20	11,890.51	9,023.66 N	1,035.16 W	513,538.06	725,486.14	1.14	9,082.10	-176.29	
21,498.00	90.42	0.20	11,890.50	9,025.66 N	1,035.15 W	513,540.06	725,486.15	1.14	9,084.09	-176.29	
21,500.00	90.40	0.20	11,890.48	9,027.66 N	1,035.14 W	513,542.06	725,486.16	1.14	9,086.08	-176.29	
21,502.00	90.38	0.20	11,890.47	9,029.66 N	1,035.14 W	513,544.06	725,486.16	1.14	9,088.07	-176.29	
21,504.00	90.35	0.20	11,890.46	9,031.66 N	1,035.13 W	513,546.06	725,486.17	1.14	9,090.06	-176.29	
21,506.00	90.33	0.20	11,890.45	9,033.66 N	1,035.12 W	513,548.06	725,486.18	1.14	9,092.05	-176.29	
21,508.00	90.31	0.19	11,890.44	9,035.66 N	1,035.12 W	513,550.06	725,486.18	1.14	9,094.04	-176.29	
21,510.00	90.28	0.19	11,890.43	9,037.66 N	1,035.11 W	513,552.06	725,486.19	1.14	9,096.02	-176.29	
21,512.00	90.26	0.19	11,890.42	9,039.66 N	1,035.10 W	513,554.06	725,486.20	1.14	9,098.01	-176.29	
21,514.00	90.26	0.21	11,890.41	9,041.66 N	1,035.10 W	513,556.06	725,486.20	0.89	9,100.00	101.24	
21,516.00	90.27	0.24	11,890.40	9,043.66 N	1,035.09 W	513,558.06	725,486.21	1.98	9,101.99	66.55	
21,518.00	90.29	0.28	11,890.39	9,045.66 N	1,035.08 W	513,560.06	725,486.22	1.98	9,103.98	66.55	
21,520.00	90.31	0.32	11,890.38	9,047.66 N	1,035.07 W	513,562.06	725,486.23	1.98	9,105.97	66.55	
21,522.00	90.32	0.35	11,890.37	9,049.66 N	1,035.06 W	513,564.06	725,486.24	1.98	9,107.96	66.55	
21,524.00	90.34	0.39	11,890.35	9,051.66 N	1,035.04 W	513,566.06	725,486.26	1.98	9,109.95	66.55	
21,526.00	90.35	0.43	11,890.34	9,053.66 N	1,035.03 W	513,568.06	725,486.27	1.98	9,111.93	66.55	
21,528.00	90.37	0.46	11,890.33	9,055.66 N	1,035.01 W	513,570.06	725,486.29	1.98	9,113.92	66.55	
21,530.00	90.38	0.50	11,890.32	9,057.66 N	1,035.00 W	513,572.06	725,486.30	1.98	9,115.91	66.55	
21,532.00	90.40	0.54	11,890.30	9,059.66 N	1,034.98 W	513,574.06	725,486.32	1.98	9,117.90	66.55	
21,534.00	90.42	0.57	11,890.29	9,061.66 N	1,034.96 W	513,576.06	725,486.34	1.98	9,119.88	66.56	
21,536.00	90.43	0.61	11,890.27	9,063.66 N	1,034.94 W	513,578.06	725,486.36	1.98	9,121.87	66.56	
21,538.00	90.45	0.65	11,890.26	9,065.66 N	1,034.92 W	513,580.06	725,486.38	1.98	9,123.86	66.56	
21,540.00	90.46	0.68	11,890.24	9,067.66 N	1,034.89 W	513,582.06	725,486.41	1.98	9,125.85	66.56	
21,542.00	90.48	0.72	11,890.23	9,069.66 N	1,034.87 W	513,584.06	725,486.43	1.98	9,127.83	66.56	
21,544.00	90.49	0.75	11,890.21	9,071.66 N	1,034.84 W	513,586.06	725,486.46	1.98	9,129.82	66.56	
21,546.00	90.51	0.79	11,890.19	9,073.66 N	1,034.82 W	513,588.06	725,486.48	1.98	9,131.81	66.56	
21,548.00	90.53	0.83	11,890.17	9,075.66 N	1,034.79 W	513,590.06	725,486.51	1.98	9,133.79	66.56	
21,550.00	90.54	0.86	11,890.16	9,077.66 N	1,034.76 W	513,592.06	725,486.54	1.98	9,135.78	66.56	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
21,552.00	90.56	0.90	11,890.14	9,079.66 N	1,034.73 W	513,594.06	725,486.57	1.98	9,137.77	66.56	
21,554.00	90.57	0.94	11,890.12	9,081.66 N	1,034.70 W	513,596.06	725,486.60	1.98	9,139.75	66.56	
21,556.00	90.59	0.97	11,890.10	9,083.66 N	1,034.66 W	513,598.06	725,486.64	1.98	9,141.74	66.56	
21,558.00	90.61	1.01	11,890.08	9,085.66 N	1,034.63 W	513,600.06	725,486.67	1.98	9,143.72	66.56	
21,560.00	90.62	1.05	11,890.05	9,087.66 N	1,034.59 W	513,602.06	725,486.71	1.98	9,145.71	66.56	
21,562.00	90.64	1.08	11,890.03	9,089.66 N	1,034.56 W	513,604.06	725,486.74	1.98	9,147.70	66.56	
21,564.00	90.65	1.12	11,890.01	9,091.66 N	1,034.52 W	513,606.06	725,486.78	1.98	9,149.68	66.56	
21,566.00	90.67	1.16	11,889.99	9,093.66 N	1,034.48 W	513,608.06	725,486.82	1.98	9,151.67	66.56	
21,568.00	90.68	1.19	11,889.96	9,095.66 N	1,034.44 W	513,610.06	725,486.86	1.98	9,153.65	66.56	
21,570.00	90.70	1.23	11,889.94	9,097.65 N	1,034.39 W	513,612.05	725,486.91	1.98	9,155.64	66.56	
21,572.00	90.72	1.26	11,889.91	9,099.65 N	1,034.35 W	513,614.05	725,486.95	1.98	9,157.62	66.56	
21,574.00	90.73	1.30	11,889.89	9,101.65 N	1,034.31 W	513,616.05	725,486.99	1.98	9,159.61	66.56	
21,576.00	90.75	1.34	11,889.86	9,103.65 N	1,034.26 W	513,618.05	725,487.04	1.98	9,161.59	66.56	
21,578.00	90.76	1.37	11,889.84	9,105.65 N	1,034.21 W	513,620.05	725,487.09	1.98	9,163.57	66.56	
21,580.00	90.78	1.41	11,889.81	9,107.65 N	1,034.16 W	513,622.05	725,487.14	1.98	9,165.56	66.56	
21,582.00	90.79	1.45	11,889.78	9,109.65 N	1,034.11 W	513,624.05	725,487.19	1.98	9,167.54	66.56	
21,584.00	90.81	1.48	11,889.75	9,111.65 N	1,034.06 W	513,626.05	725,487.24	1.98	9,169.53	66.56	
21,586.00	90.83	1.52	11,889.73	9,113.65 N	1,034.01 W	513,628.05	725,487.29	1.98	9,171.51	66.57	
21,588.00	90.84	1.56	11,889.70	9,115.65 N	1,033.96 W	513,630.05	725,487.34	1.98	9,173.49	66.57	
21,590.00	90.86	1.59	11,889.67	9,117.65 N	1,033.90 W	513,632.05	725,487.40	1.98	9,175.48	66.57	
21,592.00	90.87	1.63	11,889.64	9,119.65 N	1,033.85 W	513,634.05	725,487.45	1.98	9,177.46	66.57	
21,594.00	90.89	1.67	11,889.61	9,121.64 N	1,033.79 W	513,636.04	725,487.51	1.98	9,179.44	66.57	
21,596.00	90.91	1.70	11,889.57	9,123.64 N	1,033.73 W	513,638.04	725,487.57	1.98	9,181.42	66.57	
21,598.00	90.92	1.74	11,889.54	9,125.64 N	1,033.67 W	513,640.04	725,487.63	1.98	9,183.41	66.57	
21,600.00	90.94	1.77	11,889.51	9,127.64 N	1,033.61 W	513,642.04	725,487.69	1.98	9,185.39	66.57	
21,602.00	90.95	1.81	11,889.48	9,129.64 N	1,033.55 W	513,644.04	725,487.75	1.98	9,187.37	66.57	
21,604.00	90.97	1.85	11,889.44	9,131.64 N	1,033.48 W	513,646.04	725,487.82	1.98	9,189.35	66.57	
21,606.00	90.98	1.88	11,889.41	9,133.64 N	1,033.42 W	513,648.04	725,487.88	1.98	9,191.33	66.57	
21,608.00	91.00	1.92	11,889.37	9,135.64 N	1,033.35 W	513,650.04	725,487.95	1.98	9,193.32	66.57	
21,610.00	90.99	1.91	11,889.34	9,137.63 N	1,033.28 W	513,652.03	725,488.02	0.78	9,195.30	-144.37	
21,612.00	90.97	1.90	11,889.31	9,139.63 N	1,033.22 W	513,654.03	725,488.08	0.78	9,197.28	-144.37	
21,614.00	90.96	1.89	11,889.27	9,141.63 N	1,033.15 W	513,656.03	725,488.15	0.78	9,199.26	-144.37	
21,616.00	90.95	1.88	11,889.24	9,143.63 N	1,033.09 W	513,658.03	725,488.21	0.78	9,201.24	-144.37	
21,618.00	90.94	1.87	11,889.21	9,145.63 N	1,033.02 W	513,660.03	725,488.28	0.78	9,203.22	-144.37	
21,620.00	90.92	1.87	11,889.17	9,147.63 N	1,032.95 W	513,662.03	725,488.35	0.78	9,205.21	-144.37	
21,622.00	90.91	1.86	11,889.14	9,149.63 N	1,032.89 W	513,664.03	725,488.41	0.78	9,207.19	-144.37	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
21,624.00	90.90	1.85	11,889.11	9,151.63 N	1,032.82 W	513,666.03	725,488.48	0.78	9,209.17	-144.37	
21,626.00	90.89	1.84	11,889.08	9,153.62 N	1,032.76 W	513,668.02	725,488.54	0.78	9,211.15	-144.37	
21,628.00	90.87	1.83	11,889.05	9,155.62 N	1,032.70 W	513,670.02	725,488.60	0.78	9,213.13	-144.37	
21,630.00	90.86	1.82	11,889.02	9,157.62 N	1,032.63 W	513,672.02	725,488.67	0.78	9,215.12	-144.37	
21,632.00	90.85	1.81	11,888.99	9,159.62 N	1,032.57 W	513,674.02	725,488.73	0.78	9,217.10	-144.37	
21,634.00	90.83	1.80	11,888.96	9,161.62 N	1,032.51 W	513,676.02	725,488.79	0.78	9,219.08	-144.37	
21,636.00	90.82	1.79	11,888.93	9,163.62 N	1,032.44 W	513,678.02	725,488.86	0.78	9,221.06	-144.37	
21,638.00	90.81	1.78	11,888.90	9,165.62 N	1,032.38 W	513,680.02	725,488.92	0.78	9,223.04	-144.37	
21,640.00	90.80	1.77	11,888.87	9,167.62 N	1,032.32 W	513,682.02	725,488.98	0.78	9,225.03	-144.37	
21,642.00	90.78	1.77	11,888.85	9,169.61 N	1,032.26 W	513,684.01	725,489.04	0.78	9,227.01	-144.37	
21,644.00	90.77	1.76	11,888.82	9,171.61 N	1,032.20 W	513,686.01	725,489.10	0.78	9,228.99	-144.37	
21,646.00	90.76	1.75	11,888.79	9,173.61 N	1,032.13 W	513,688.01	725,489.17	0.78	9,230.97	-144.37	
21,648.00	90.75	1.74	11,888.77	9,175.61 N	1,032.07 W	513,690.01	725,489.23	0.78	9,232.96	-144.37	
21,650.00	90.73	1.73	11,888.74	9,177.61 N	1,032.01 W	513,692.01	725,489.29	0.78	9,234.94	-144.37	
21,652.00	90.72	1.72	11,888.71	9,179.61 N	1,031.95 W	513,694.01	725,489.35	0.78	9,236.92	-144.37	
21,654.00	90.71	1.71	11,888.69	9,181.61 N	1,031.89 W	513,696.01	725,489.41	0.78	9,238.90	-144.37	
21,656.00	90.70	1.70	11,888.66	9,183.61 N	1,031.83 W	513,698.01	725,489.47	0.78	9,240.89	-144.37	
21,658.00	90.68	1.69	11,888.64	9,185.61 N	1,031.77 W	513,700.01	725,489.53	0.78	9,242.87	-144.37	
21,660.00	90.67	1.68	11,888.62	9,187.60 N	1,031.72 W	513,702.00	725,489.58	0.78	9,244.85	-144.37	
21,662.00	90.66	1.67	11,888.59	9,189.60 N	1,031.66 W	513,704.00	725,489.64	0.78	9,246.84	-144.37	
21,664.00	90.64	1.67	11,888.57	9,191.60 N	1,031.60 W	513,706.00	725,489.70	0.78	9,248.82	-144.37	
21,666.00	90.63	1.66	11,888.55	9,193.60 N	1,031.54 W	513,708.00	725,489.76	0.78	9,250.80	-144.37	
21,668.00	90.62	1.65	11,888.53	9,195.60 N	1,031.48 W	513,710.00	725,489.82	0.78	9,252.78	-144.37	
21,670.00	90.61	1.64	11,888.51	9,197.60 N	1,031.43 W	513,712.00	725,489.87	0.78	9,254.77	-144.37	
21,672.00	90.59	1.63	11,888.48	9,199.60 N	1,031.37 W	513,714.00	725,489.93	0.78	9,256.75	-144.37	
21,674.00	90.58	1.62	11,888.46	9,201.60 N	1,031.31 W	513,716.00	725,489.99	0.78	9,258.73	-144.37	
21,676.00	90.57	1.61	11,888.44	9,203.60 N	1,031.26 W	513,718.00	725,490.04	0.78	9,260.72	-144.37	
21,678.00	90.56	1.60	11,888.42	9,205.60 N	1,031.20 W	513,720.00	725,490.10	0.78	9,262.70	-144.37	
21,680.00	90.54	1.59	11,888.41	9,207.60 N	1,031.14 W	513,722.00	725,490.16	0.78	9,264.68	-144.37	
21,682.00	90.53	1.58	11,888.39	9,209.59 N	1,031.09 W	513,723.99	725,490.21	0.78	9,266.67	-144.37	
21,684.00	90.52	1.57	11,888.37	9,211.59 N	1,031.03 W	513,725.99	725,490.27	0.78	9,268.65	-144.37	
21,686.00	90.50	1.57	11,888.35	9,213.59 N	1,030.98 W	513,727.99	725,490.32	0.78	9,270.63	-144.37	
21,688.00	90.49	1.56	11,888.33	9,215.59 N	1,030.92 W	513,729.99	725,490.38	0.78	9,272.62	-144.37	
21,690.00	90.48	1.55	11,888.32	9,217.59 N	1,030.87 W	513,731.99	725,490.43	0.78	9,274.60	-144.37	
21,692.00	90.47	1.54	11,888.30	9,219.59 N	1,030.82 W	513,733.99	725,490.48	0.78	9,276.58	-144.37	
21,694.00	90.45	1.53	11,888.28	9,221.59 N	1,030.76 W	513,735.99	725,490.54	0.78	9,278.57	-144.37	
21,696.00	90.44	1.52	11,888.27	9,223.59 N	1,030.71 W	513,737.99	725,490.59	0.78	9,280.55	-144.37	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
21,698.00	90.43	1.51	11,888.25	9,225.59 N	1,030.66 W	513,739.99	725,490.64	0.78	9,282.53	-144.37	
21,700.00	90.42	1.50	11,888.24	9,227.59 N	1,030.60 W	513,741.99	725,490.70	0.78	9,284.52	-144.37	
21,702.00	90.40	1.49	11,888.22	9,229.59 N	1,030.55 W	513,743.99	725,490.75	0.78	9,286.50	-144.37	
21,704.00	90.39	1.48	11,888.21	9,231.59 N	1,030.50 W	513,745.99	725,490.80	0.78	9,288.48	-144.37	
21,706.00	90.38	1.47	11,888.20	9,233.59 N	1,030.45 W	513,747.99	725,490.85	0.78	9,290.47	-144.37	
21,708.00	90.37	1.46	11,888.18	9,235.58 N	1,030.40 W	513,749.98	725,490.90	0.78	9,292.45	-144.37	
21,710.00	90.35	1.46	11,888.17	9,237.58 N	1,030.35 W	513,751.98	725,490.95	0.78	9,294.44	-144.37	
21,712.00	90.34	1.45	11,888.16	9,239.58 N	1,030.30 W	513,753.98	725,491.00	0.78	9,296.42	-144.37	
21,714.00	90.33	1.44	11,888.15	9,241.58 N	1,030.25 W	513,755.98	725,491.05	0.78	9,298.40	-144.37	
21,716.00	90.31	1.43	11,888.14	9,243.58 N	1,030.20 W	513,757.98	725,491.10	0.78	9,300.39	-144.37	
21,718.00	90.30	1.42	11,888.13	9,245.58 N	1,030.15 W	513,759.98	725,491.15	0.78	9,302.37	-144.37	
21,720.00	90.29	1.41	11,888.11	9,247.58 N	1,030.10 W	513,761.98	725,491.20	0.78	9,304.36	-144.37	
21,722.00	90.28	1.40	11,888.11	9,249.58 N	1,030.05 W	513,763.98	725,491.25	0.78	9,306.34	-144.37	
21,724.00	90.26	1.39	11,888.10	9,251.58 N	1,030.00 W	513,765.98	725,491.30	0.78	9,308.32	-144.37	
21,726.00	90.25	1.38	11,888.09	9,253.58 N	1,029.95 W	513,767.98	725,491.35	0.78	9,310.31	-144.37	
21,728.00	90.24	1.37	11,888.08	9,255.58 N	1,029.90 W	513,769.98	725,491.40	0.78	9,312.29	-144.37	
21,730.00	90.23	1.36	11,888.07	9,257.58 N	1,029.85 W	513,771.98	725,491.45	0.78	9,314.28	-144.37	
21,732.00	90.21	1.36	11,888.06	9,259.58 N	1,029.81 W	513,773.98	725,491.49	0.78	9,316.26	-144.37	
21,734.00	90.20	1.35	11,888.06	9,261.58 N	1,029.76 W	513,775.98	725,491.54	0.78	9,318.25	-144.37	
21,736.00	90.19	1.34	11,888.05	9,263.58 N	1,029.71 W	513,777.98	725,491.59	0.78	9,320.23	-144.37	
21,738.00	90.17	1.33	11,888.04	9,265.58 N	1,029.67 W	513,779.98	725,491.63	0.78	9,322.21	-144.37	
21,740.00	90.16	1.32	11,888.04	9,267.57 N	1,029.62 W	513,781.97	725,491.68	0.78	9,324.20	-144.37	
21,742.00	90.15	1.31	11,888.03	9,269.57 N	1,029.57 W	513,783.97	725,491.73	0.78	9,326.18	-144.37	
21,744.00	90.14	1.30	11,888.03	9,271.57 N	1,029.53 W	513,785.97	725,491.77	0.78	9,328.17	-144.37	
21,746.00	90.12	1.29	11,888.02	9,273.57 N	1,029.48 W	513,787.97	725,491.82	0.78	9,330.15	-144.37	
21,748.00	90.11	1.28	11,888.02	9,275.57 N	1,029.44 W	513,789.97	725,491.86	0.78	9,332.14	-144.37	
21,750.00	90.10	1.27	11,888.01	9,277.57 N	1,029.39 W	513,791.97	725,491.91	0.78	9,334.12	-144.37	
21,752.00	90.09	1.26	11,888.01	9,279.57 N	1,029.35 W	513,793.97	725,491.95	0.78	9,336.11	-144.37	
21,754.00	90.07	1.26	11,888.01	9,281.57 N	1,029.31 W	513,795.97	725,491.99	0.78	9,338.09	-144.37	
21,756.00	90.06	1.25	11,888.01	9,283.57 N	1,029.26 W	513,797.97	725,492.04	0.78	9,340.08	-144.37	
21,758.00	90.05	1.24	11,888.00	9,285.57 N	1,029.22 W	513,799.97	725,492.08	0.78	9,342.06	-144.37	
21,760.00	90.03	1.23	11,888.00	9,287.57 N	1,029.18 W	513,801.97	725,492.12	0.78	9,344.05	-144.37	
21,762.00	90.02	1.22	11,888.00	9,289.57 N	1,029.13 W	513,803.97	725,492.17	0.78	9,346.03	-144.37	
21,764.00	90.01	1.21	11,888.00	9,291.57 N	1,029.09 W	513,805.97	725,492.21	0.78	9,348.02	-144.37	
21,766.00	90.00	1.20	11,888.00	9,293.57 N	1,029.05 W	513,807.97	725,492.25	0.78	9,350.00	-144.38	
21,768.00	89.98	1.19	11,888.00	9,295.57 N	1,029.01 W	513,809.97	725,492.29	0.78	9,351.99	-144.38	
21,770.00	89.97	1.18	11,888.00	9,297.57 N	1,028.96 W	513,811.97	725,492.34	0.78	9,353.97	-144.37	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
21,772.00	89.96	1.17	11,888.00	9,299.57 N	1,028.92 W	513,813.97	725,492.38	0.78	9,355.96	-144.37	
21,774.00	89.95	1.16	11,888.00	9,301.57 N	1,028.88 W	513,815.97	725,492.42	0.78	9,357.94	-144.37	
21,776.00	89.93	1.16	11,888.01	9,303.57 N	1,028.84 W	513,817.97	725,492.46	0.78	9,359.93	-144.37	
21,778.00	89.92	1.15	11,888.01	9,305.57 N	1,028.80 W	513,819.97	725,492.50	0.78	9,361.91	-144.37	
21,780.00	89.91	1.14	11,888.01	9,307.57 N	1,028.76 W	513,821.97	725,492.54	0.78	9,363.90	-144.37	
21,782.00	89.90	1.13	11,888.02	9,309.57 N	1,028.72 W	513,823.97	725,492.58	0.78	9,365.88	-144.37	
21,784.00	89.88	1.12	11,888.02	9,311.56 N	1,028.68 W	513,825.96	725,492.62	0.78	9,367.87	-144.37	
21,786.00	89.87	1.11	11,888.02	9,313.56 N	1,028.64 W	513,827.96	725,492.66	0.78	9,369.85	-144.37	
21,788.00	89.86	1.10	11,888.03	9,315.56 N	1,028.61 W	513,829.96	725,492.69	0.78	9,371.84	-144.37	
21,790.00	89.84	1.09	11,888.03	9,317.56 N	1,028.57 W	513,831.96	725,492.73	0.78	9,373.82	-144.37	
21,792.00	89.83	1.08	11,888.04	9,319.56 N	1,028.53 W	513,833.96	725,492.77	0.78	9,375.81	-144.37	
21,794.00	89.82	1.07	11,888.05	9,321.56 N	1,028.49 W	513,835.96	725,492.81	0.78	9,377.80	-144.37	
21,796.00	89.81	1.06	11,888.05	9,323.56 N	1,028.46 W	513,837.96	725,492.84	0.78	9,379.78	-144.37	
21,798.00	89.81	1.06	11,888.06	9,325.56 N	1,028.42 W	513,839.96	725,492.88	0.07	9,381.77	-118.32	
21,800.00	89.82	1.07	11,888.07	9,327.56 N	1,028.38 W	513,841.96	725,492.92	0.66	9,383.75	30.25	
21,802.00	89.83	1.08	11,888.07	9,329.56 N	1,028.34 W	513,843.96	725,492.96	0.66	9,385.74	30.25	
21,804.00	89.84	1.08	11,888.08	9,331.56 N	1,028.31 W	513,845.96	725,492.99	0.66	9,387.72	30.25	
21,806.00	89.85	1.09	11,888.08	9,333.56 N	1,028.27 W	513,847.96	725,493.03	0.66	9,389.71	30.25	
21,808.00	89.86	1.10	11,888.09	9,335.56 N	1,028.23 W	513,849.96	725,493.07	0.66	9,391.69	30.25	
21,810.00	89.87	1.10	11,888.09	9,337.56 N	1,028.19 W	513,851.96	725,493.11	0.66	9,393.68	30.25	
21,812.00	89.89	1.11	11,888.10	9,339.56 N	1,028.15 W	513,853.96	725,493.15	0.66	9,395.67	30.25	
21,814.00	89.90	1.12	11,888.10	9,341.56 N	1,028.11 W	513,855.96	725,493.19	0.66	9,397.65	30.25	
21,816.00	89.91	1.12	11,888.10	9,343.56 N	1,028.07 W	513,857.96	725,493.23	0.66	9,399.64	30.25	
21,818.00	89.92	1.13	11,888.11	9,345.56 N	1,028.04 W	513,859.96	725,493.26	0.66	9,401.62	30.25	
21,820.00	89.93	1.14	11,888.11	9,347.56 N	1,028.00 W	513,861.96	725,493.30	0.66	9,403.61	30.25	
21,822.00	89.94	1.14	11,888.11	9,349.56 N	1,027.96 W	513,863.96	725,493.34	0.66	9,405.59	30.25	
21,824.00	89.95	1.15	11,888.11	9,351.56 N	1,027.92 W	513,865.96	725,493.38	0.66	9,407.58	30.25	
21,826.00	89.96	1.16	11,888.11	9,353.56 N	1,027.88 W	513,867.96	725,493.42	0.66	9,409.56	30.25	
21,828.00	89.98	1.16	11,888.12	9,355.56 N	1,027.84 W	513,869.96	725,493.46	0.66	9,411.55	30.25	
21,830.00	89.99	1.17	11,888.12	9,357.56 N	1,027.79 W	513,871.96	725,493.51	0.66	9,413.53	30.25	
21,832.00	90.00	1.18	11,888.12	9,359.56 N	1,027.75 W	513,873.96	725,493.55	0.66	9,415.52	30.25	
21,834.00	90.01	1.18	11,888.12	9,361.56 N	1,027.71 W	513,875.96	725,493.59	0.66	9,417.50	30.25	
21,836.00	90.02	1.19	11,888.12	9,363.55 N	1,027.67 W	513,877.95	725,493.63	0.66	9,419.49	30.25	
21,838.00	90.03	1.20	11,888.11	9,365.55 N	1,027.63 W	513,879.95	725,493.67	0.66	9,421.47	30.25	
21,840.00	90.04	1.20	11,888.11	9,367.55 N	1,027.59 W	513,881.95	725,493.71	0.66	9,423.46	30.25	
21,842.00	90.06	1.21	11,888.11	9,369.55 N	1,027.55 W	513,883.95	725,493.75	0.66	9,425.44	30.25	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
21,844.00	90.07	1.22	11,888.11	9,371.55 N	1,027.50 W	513,885.95	725,493.80	0.66	9,427.43	30.25	
21,846.00	90.08	1.22	11,888.11	9,373.55 N	1,027.46 W	513,887.95	725,493.84	0.66	9,429.41	30.25	
21,848.00	90.09	1.23	11,888.10	9,375.55 N	1,027.42 W	513,889.95	725,493.88	0.66	9,431.40	30.25	
21,850.00	90.10	1.24	11,888.10	9,377.55 N	1,027.37 W	513,891.95	725,493.93	0.66	9,433.38	30.25	
21,852.00	90.11	1.24	11,888.10	9,379.55 N	1,027.33 W	513,893.95	725,493.97	0.66	9,435.37	30.25	
21,854.00	90.12	1.25	11,888.09	9,381.55 N	1,027.29 W	513,895.95	725,494.01	0.66	9,437.35	30.25	
21,856.00	90.14	1.26	11,888.09	9,383.55 N	1,027.24 W	513,897.95	725,494.06	0.66	9,439.34	30.25	
21,858.00	90.15	1.26	11,888.08	9,385.55 N	1,027.20 W	513,899.95	725,494.10	0.66	9,441.32	30.25	
21,860.00	90.16	1.27	11,888.08	9,387.55 N	1,027.16 W	513,901.95	725,494.14	0.66	9,443.31	30.25	
21,862.00	90.17	1.28	11,888.07	9,389.55 N	1,027.11 W	513,903.95	725,494.19	0.66	9,445.29	30.25	
21,864.00	90.18	1.28	11,888.07	9,391.55 N	1,027.07 W	513,905.95	725,494.23	0.66	9,447.28	30.25	
21,866.00	90.19	1.29	11,888.06	9,393.55 N	1,027.02 W	513,907.95	725,494.28	0.66	9,449.26	30.25	
21,868.00	90.20	1.30	11,888.05	9,395.55 N	1,026.98 W	513,909.95	725,494.32	0.66	9,451.25	30.25	
21,870.00	90.21	1.30	11,888.05	9,397.55 N	1,026.93 W	513,911.95	725,494.37	0.66	9,453.23	30.25	
21,872.00	90.23	1.31	11,888.04	9,399.55 N	1,026.89 W	513,913.95	725,494.41	0.66	9,455.22	30.25	
21,874.00	90.24	1.32	11,888.03	9,401.55 N	1,026.84 W	513,915.95	725,494.46	0.66	9,457.20	30.25	
21,876.00	90.25	1.32	11,888.02	9,403.54 N	1,026.79 W	513,917.94	725,494.51	0.66	9,459.18	30.25	
21,878.00	90.26	1.33	11,888.01	9,405.54 N	1,026.75 W	513,919.94	725,494.55	0.66	9,461.17	30.25	
21,880.00	90.27	1.34	11,888.00	9,407.54 N	1,026.70 W	513,921.94	725,494.60	0.66	9,463.15	30.25	
21,882.00	90.28	1.34	11,887.99	9,409.54 N	1,026.66 W	513,923.94	725,494.64	0.66	9,465.14	30.25	
21,884.00	90.29	1.35	11,887.98	9,411.54 N	1,026.61 W	513,925.94	725,494.69	0.66	9,467.12	30.25	
21,886.00	90.31	1.36	11,887.97	9,413.54 N	1,026.56 W	513,927.94	725,494.74	0.66	9,469.11	30.25	
21,888.00	90.32	1.36	11,887.96	9,415.54 N	1,026.51 W	513,929.94	725,494.79	0.66	9,471.09	30.26	
21,890.00	90.33	1.37	11,887.95	9,417.54 N	1,026.47 W	513,931.94	725,494.83	0.66	9,473.07	30.26	
21,892.00	90.34	1.37	11,887.94	9,419.54 N	1,026.42 W	513,933.94	725,494.88	0.66	9,475.06	30.26	
21,894.00	90.35	1.38	11,887.93	9,421.54 N	1,026.37 W	513,935.94	725,494.93	0.66	9,477.04	30.26	
21,896.00	90.36	1.39	11,887.91	9,423.54 N	1,026.32 W	513,937.94	725,494.98	0.66	9,479.03	30.26	
21,898.00	90.37	1.39	11,887.90	9,425.54 N	1,026.27 W	513,939.94	725,495.03	0.66	9,481.01	30.26	
21,900.00	90.39	1.40	11,887.89	9,427.54 N	1,026.22 W	513,941.94	725,495.08	0.66	9,483.00	30.26	
21,902.00	90.40	1.41	11,887.87	9,429.54 N	1,026.18 W	513,943.94	725,495.12	0.66	9,484.98	30.26	
21,904.00	90.41	1.41	11,887.86	9,431.54 N	1,026.13 W	513,945.94	725,495.17	0.66	9,486.96	30.26	
21,906.00	90.42	1.42	11,887.85	9,433.54 N	1,026.08 W	513,947.94	725,495.22	0.66	9,488.95	30.26	
21,908.00	90.43	1.43	11,887.83	9,435.54 N	1,026.03 W	513,949.94	725,495.27	0.66	9,490.93	30.26	
21,910.00	90.44	1.43	11,887.82	9,437.53 N	1,025.98 W	513,951.93	725,495.32	0.66	9,492.92	30.26	
21,912.00	90.45	1.44	11,887.80	9,439.53 N	1,025.93 W	513,953.93	725,495.37	0.66	9,494.90	30.26	
21,914.00	90.47	1.45	11,887.78	9,441.53 N	1,025.88 W	513,955.93	725,495.42	0.66	9,496.88	30.26	
21,916.00	90.48	1.45	11,887.77	9,443.53 N	1,025.83 W	513,957.93	725,495.47	0.66	9,498.87	30.26	

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Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
21,918.00	90.49	1.46	11,887.75	9,445.53 N	1,025.77 W	513,959.93	725,495.53	0.66	9,500.85	30.26	
21,920.00	90.50	1.47	11,887.73	9,447.53 N	1,025.72 W	513,961.93	725,495.58	0.66	9,502.84	30.26	
21,922.00	90.51	1.47	11,887.72	9,449.53 N	1,025.67 W	513,963.93	725,495.63	0.66	9,504.82	30.26	
21,924.00	90.52	1.48	11,887.70	9,451.53 N	1,025.62 W	513,965.93	725,495.68	0.66	9,506.80	30.26	
21,926.00	90.53	1.49	11,887.68	9,453.53 N	1,025.57 W	513,967.93	725,495.73	0.66	9,508.79	30.26	
21,928.00	90.54	1.49	11,887.66	9,455.53 N	1,025.52 W	513,969.93	725,495.78	0.66	9,510.77	30.26	
21,930.00	90.56	1.50	11,887.64	9,457.53 N	1,025.46 W	513,971.93	725,495.84	0.66	9,512.75	30.26	
21,932.00	90.57	1.51	11,887.62	9,459.53 N	1,025.41 W	513,973.93	725,495.89	0.66	9,514.74	30.26	
21,934.00	90.58	1.51	11,887.60	9,461.53 N	1,025.36 W	513,975.93	725,495.94	0.66	9,516.72	30.26	
21,936.00	90.59	1.52	11,887.58	9,463.52 N	1,025.31 W	513,977.92	725,495.99	0.66	9,518.70	30.26	
21,938.00	90.60	1.53	11,887.56	9,465.52 N	1,025.25 W	513,979.92	725,496.05	0.66	9,520.69	30.26	
21,940.00	90.61	1.53	11,887.54	9,467.52 N	1,025.20 W	513,981.92	725,496.10	0.66	9,522.67	30.26	
21,942.00	90.62	1.54	11,887.52	9,469.52 N	1,025.15 W	513,983.92	725,496.15	0.66	9,524.66	30.26	
21,944.00	90.64	1.55	11,887.50	9,471.52 N	1,025.09 W	513,985.92	725,496.21	0.66	9,526.64	30.26	
21,946.00	90.65	1.55	11,887.47	9,473.52 N	1,025.04 W	513,987.92	725,496.26	0.66	9,528.62	30.26	
21,948.00	90.66	1.56	11,887.45	9,475.52 N	1,024.98 W	513,989.92	725,496.32	0.66	9,530.61	30.26	
21,950.00	90.67	1.57	11,887.43	9,477.52 N	1,024.93 W	513,991.92	725,496.37	0.66	9,532.59	30.26	
21,952.00	90.68	1.57	11,887.40	9,479.52 N	1,024.87 W	513,993.92	725,496.43	0.66	9,534.57	30.26	
21,954.00	90.69	1.58	11,887.38	9,481.52 N	1,024.82 W	513,995.92	725,496.48	0.66	9,536.56	30.26	
21,956.00	90.70	1.59	11,887.36	9,483.52 N	1,024.76 W	513,997.92	725,496.54	0.66	9,538.54	30.26	
21,958.00	90.72	1.59	11,887.33	9,485.52 N	1,024.71 W	513,999.92	725,496.59	0.66	9,540.52	30.26	
21,960.00	90.73	1.60	11,887.31	9,487.51 N	1,024.65 W	514,001.91	725,496.65	0.66	9,542.50	30.26	
21,962.00	90.74	1.61	11,887.28	9,489.51 N	1,024.60 W	514,003.91	725,496.70	0.66	9,544.49	30.26	
21,964.00	90.75	1.61	11,887.25	9,491.51 N	1,024.54 W	514,005.91	725,496.76	0.66	9,546.47	30.26	
21,966.00	90.76	1.62	11,887.23	9,493.51 N	1,024.48 W	514,007.91	725,496.82	0.66	9,548.45	30.26	
21,968.00	90.77	1.63	11,887.20	9,495.51 N	1,024.43 W	514,009.91	725,496.87	0.66	9,550.44	30.26	
21,970.00	90.78	1.63	11,887.17	9,497.51 N	1,024.37 W	514,011.91	725,496.93	0.66	9,552.42	30.26	
21,972.00	90.79	1.64	11,887.15	9,499.51 N	1,024.31 W	514,013.91	725,496.99	0.66	9,554.40	30.26	
21,974.00	90.81	1.65	11,887.12	9,501.51 N	1,024.26 W	514,015.91	725,497.04	0.66	9,556.39	30.26	
21,976.00	90.82	1.65	11,887.09	9,503.51 N	1,024.20 W	514,017.91	725,497.10	0.66	9,558.37	30.26	
21,978.00	90.83	1.66	11,887.06	9,505.51 N	1,024.14 W	514,019.91	725,497.16	0.66	9,560.35	30.26	
21,980.00	90.84	1.67	11,887.03	9,507.50 N	1,024.08 W	514,021.90	725,497.22	0.66	9,562.33	30.26	
21,982.00	90.85	1.67	11,887.00	9,509.50 N	1,024.02 W	514,023.90	725,497.28	0.66	9,564.32	30.26	
21,984.00	90.86	1.68	11,886.97	9,511.50 N	1,023.97 W	514,025.90	725,497.33	0.66	9,566.30	30.26	
21,986.00	90.87	1.69	11,886.94	9,513.50 N	1,023.91 W	514,027.90	725,497.39	0.66	9,568.28	30.26	
21,988.00	90.86	1.67	11,886.91	9,515.50 N	1,023.85 W	514,029.90	725,497.45	1.08	9,570.27	-128.72	
21,990.00	90.82	1.63	11,886.88	9,517.50 N	1,023.79 W	514,031.90	725,497.51	2.78	9,572.25	-133.60	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
21,992.00	90.78	1.59	11,886.86	9,519.50 N	1,023.73 W	514,033.90	725,497.57	2.78	9,574.23	-133.60	
21,994.00	90.75	1.55	11,886.83	9,521.50 N	1,023.68 W	514,035.90	725,497.62	2.78	9,576.21	-133.60	
21,996.00	90.71	1.51	11,886.80	9,523.50 N	1,023.63 W	514,037.90	725,497.67	2.78	9,578.20	-133.60	
21,998.00	90.67	1.47	11,886.78	9,525.50 N	1,023.57 W	514,039.90	725,497.73	2.78	9,580.18	-133.60	
22,000.00	90.63	1.43	11,886.76	9,527.49 N	1,023.52 W	514,041.89	725,497.78	2.78	9,582.17	-133.60	
22,002.00	90.59	1.39	11,886.73	9,529.49 N	1,023.47 W	514,043.89	725,497.83	2.78	9,584.15	-133.60	
22,004.00	90.55	1.35	11,886.71	9,531.49 N	1,023.43 W	514,045.89	725,497.87	2.78	9,586.13	-133.60	
22,006.00	90.52	1.31	11,886.70	9,533.49 N	1,023.38 W	514,047.89	725,497.92	2.78	9,588.12	-133.60	
22,008.00	90.48	1.27	11,886.68	9,535.49 N	1,023.34 W	514,049.89	725,497.96	2.78	9,590.10	-133.60	
22,010.00	90.44	1.23	11,886.66	9,537.49 N	1,023.29 W	514,051.89	725,498.01	2.78	9,592.09	-133.60	
22,012.00	90.40	1.19	11,886.65	9,539.49 N	1,023.25 W	514,053.89	725,498.05	2.78	9,594.07	-133.60	
22,014.00	90.36	1.15	11,886.63	9,541.49 N	1,023.21 W	514,055.89	725,498.09	2.78	9,596.06	-133.60	
22,016.00	90.32	1.11	11,886.62	9,543.49 N	1,023.17 W	514,057.89	725,498.13	2.78	9,598.04	-133.61	
22,018.00	90.29	1.07	11,886.61	9,545.49 N	1,023.13 W	514,059.89	725,498.17	2.78	9,600.03	-133.61	
22,020.00	90.25	1.03	11,886.60	9,547.49 N	1,023.10 W	514,061.89	725,498.20	2.78	9,602.01	-133.61	
22,022.00	90.21	0.99	11,886.59	9,549.49 N	1,023.06 W	514,063.89	725,498.24	2.78	9,604.00	-133.61	
22,024.00	90.17	0.95	11,886.59	9,551.49 N	1,023.03 W	514,065.89	725,498.27	2.78	9,605.99	-133.61	
22,026.00	90.13	0.91	11,886.58	9,553.49 N	1,022.99 W	514,067.89	725,498.31	2.78	9,607.97	-133.61	
22,028.00	90.09	0.87	11,886.58	9,555.49 N	1,022.96 W	514,069.89	725,498.34	2.78	9,609.96	-133.61	
22,030.00	90.06	0.83	11,886.58	9,557.49 N	1,022.93 W	514,071.89	725,498.37	2.78	9,611.94	-133.61	
22,032.00	90.02	0.79	11,886.58	9,559.49 N	1,022.91 W	514,073.89	725,498.39	2.78	9,613.93	-133.61	
22,034.00	89.98	0.75	11,886.58	9,561.49 N	1,022.88 W	514,075.89	725,498.42	2.78	9,615.92	-133.61	
22,036.00	89.94	0.70	11,886.58	9,563.49 N	1,022.85 W	514,077.89	725,498.45	2.78	9,617.91	-133.61	
22,038.00	89.90	0.66	11,886.58	9,565.49 N	1,022.83 W	514,079.89	725,498.47	2.78	9,619.89	-133.61	
22,040.00	89.87	0.62	11,886.58	9,567.49 N	1,022.81 W	514,081.89	725,498.49	2.78	9,621.88	-133.61	
22,042.00	89.83	0.58	11,886.59	9,569.49 N	1,022.79 W	514,083.89	725,498.51	2.78	9,623.87	-133.61	
22,044.00	89.79	0.54	11,886.60	9,571.49 N	1,022.77 W	514,085.89	725,498.53	2.78	9,625.85	-133.61	
22,046.00	89.75	0.50	11,886.60	9,573.49 N	1,022.75 W	514,087.89	725,498.55	2.78	9,627.84	-133.61	
22,048.00	89.71	0.46	11,886.61	9,575.49 N	1,022.73 W	514,089.89	725,498.57	2.78	9,629.83	-133.61	
22,050.00	89.67	0.42	11,886.62	9,577.49 N	1,022.72 W	514,091.89	725,498.58	2.78	9,631.82	-133.61	
22,052.00	89.64	0.38	11,886.64	9,579.49 N	1,022.70 W	514,093.89	725,498.60	2.78	9,633.81	-133.61	
22,054.00	89.60	0.34	11,886.65	9,581.49 N	1,022.69 W	514,095.89	725,498.61	2.78	9,635.80	-133.61	
22,056.00	89.56	0.30	11,886.66	9,583.49 N	1,022.68 W	514,097.89	725,498.62	2.78	9,637.78	-133.60	
22,058.00	89.52	0.26	11,886.68	9,585.49 N	1,022.67 W	514,099.89	725,498.63	2.78	9,639.77	-133.60	
22,060.00	89.48	0.22	11,886.70	9,587.49 N	1,022.66 W	514,101.89	725,498.64	2.78	9,641.76	-133.60	
22,062.00	89.44	0.18	11,886.72	9,589.49 N	1,022.65 W	514,103.89	725,498.65	2.78	9,643.75	-133.60	

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Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
22,064.00	89.41	0.14	11,886.74	9,591.49 N	1,022.65 W	514,105.89	725,498.65	2.78	9,645.74	-133.60	
22,066.00	89.37	0.10	11,886.76	9,593.49 N	1,022.64 W	514,107.89	725,498.66	2.78	9,647.73	-133.60	
22,068.00	89.33	0.06	11,886.78	9,595.49 N	1,022.64 W	514,109.89	725,498.66	2.78	9,649.72	-133.60	
22,070.00	89.29	0.02	11,886.80	9,597.49 N	1,022.64 W	514,111.89	725,498.66	2.78	9,651.71	-133.60	
22,072.00	89.25	359.98	11,886.83	9,599.49 N	1,022.64 W	514,113.89	725,498.66	2.78	9,653.70	-133.60	
22,074.00	89.21	359.94	11,886.86	9,601.49 N	1,022.64 W	514,115.89	725,498.66	2.78	9,655.69	-133.60	
22,076.00	89.18	359.90	11,886.88	9,603.48 N	1,022.64 W	514,117.88	725,498.66	2.78	9,657.68	-133.60	
22,078.00	89.14	359.86	11,886.91	9,605.48 N	1,022.65 W	514,119.88	725,498.65	2.78	9,659.67	-133.60	
22,080.00	89.10	359.82	11,886.94	9,607.48 N	1,022.65 W	514,121.88	725,498.65	2.78	9,661.66	-133.60	
22,082.00	89.08	359.79	11,886.98	9,609.48 N	1,022.66 W	514,123.88	725,498.64	1.69	9,663.65	-127.28	
22,084.00	89.08	359.78	11,887.01	9,611.48 N	1,022.67 W	514,125.88	725,498.63	0.70	9,665.64	-101.32	
22,086.00	89.07	359.77	11,887.04	9,613.48 N	1,022.67 W	514,127.88	725,498.63	0.70	9,667.63	-101.32	
22,088.00	89.07	359.75	11,887.07	9,615.48 N	1,022.68 W	514,129.88	725,498.62	0.70	9,669.62	-101.32	
22,090.00	89.07	359.74	11,887.11	9,617.48 N	1,022.69 W	514,131.88	725,498.61	0.70	9,671.61	-101.32	
22,092.00	89.06	359.72	11,887.14	9,619.48 N	1,022.70 W	514,133.88	725,498.60	0.70	9,673.60	-101.32	
22,094.00	89.06	359.71	11,887.17	9,621.48 N	1,022.71 W	514,135.88	725,498.59	0.70	9,675.59	-101.32	
22,096.00	89.06	359.70	11,887.20	9,623.48 N	1,022.72 W	514,137.88	725,498.58	0.70	9,677.58	-101.32	
22,098.00	89.06	359.68	11,887.24	9,625.48 N	1,022.73 W	514,139.88	725,498.57	0.70	9,679.57	-101.32	
22,100.00	89.05	359.67	11,887.27	9,627.48 N	1,022.74 W	514,141.88	725,498.56	0.70	9,681.56	-101.32	
22,102.00	89.05	359.66	11,887.30	9,629.48 N	1,022.76 W	514,143.88	725,498.54	0.70	9,683.55	-101.31	
22,104.00	89.05	359.64	11,887.34	9,631.48 N	1,022.77 W	514,145.88	725,498.53	0.70	9,685.54	-101.31	
22,106.00	89.05	359.63	11,887.37	9,633.48 N	1,022.78 W	514,147.88	725,498.52	0.70	9,687.53	-101.31	
22,108.00	89.04	359.62	11,887.40	9,635.48 N	1,022.79 W	514,149.88	725,498.51	0.70	9,689.52	-101.31	
22,110.00	89.04	359.60	11,887.44	9,637.48 N	1,022.81 W	514,151.88	725,498.49	0.70	9,691.51	-101.31	
22,112.00	89.04	359.59	11,887.47	9,639.48 N	1,022.82 W	514,153.88	725,498.48	0.70	9,693.50	-101.31	
22,114.00	89.03	359.57	11,887.50	9,641.48 N	1,022.84 W	514,155.88	725,498.46	0.70	9,695.49	-101.31	
22,116.00	89.03	359.56	11,887.54	9,643.48 N	1,022.85 W	514,157.88	725,498.45	0.70	9,697.49	-101.31	
22,118.00	89.03	359.55	11,887.57	9,645.48 N	1,022.87 W	514,159.88	725,498.43	0.70	9,699.48	-101.31	
22,120.00	89.03	359.53	11,887.60	9,647.48 N	1,022.88 W	514,161.88	725,498.42	0.70	9,701.47	-101.31	
22,122.00	89.02	359.52	11,887.64	9,649.48 N	1,022.90 W	514,163.88	725,498.40	0.70	9,703.46	-101.31	
22,124.00	89.02	359.51	11,887.67	9,651.48 N	1,022.92 W	514,165.88	725,498.38	0.70	9,705.45	-101.31	
22,126.00	89.02	359.49	11,887.71	9,653.48 N	1,022.93 W	514,167.88	725,498.37	0.70	9,707.44	-101.31	
22,128.00	89.02	359.48	11,887.74	9,655.48 N	1,022.95 W	514,169.88	725,498.35	0.70	9,709.43	-101.31	
22,130.00	89.01	359.46	11,887.78	9,657.48 N	1,022.97 W	514,171.88	725,498.33	0.70	9,711.42	-101.31	
22,132.00	89.01	359.45	11,887.81	9,659.48 N	1,022.99 W	514,173.88	725,498.31	0.70	9,713.41	-101.31	
22,134.00	89.01	359.44	11,887.85	9,661.48 N	1,023.01 W	514,175.88	725,498.29	0.70	9,715.41	-101.31	
22,136.00	89.00	359.42	11,887.88	9,663.48 N	1,023.03 W	514,177.88	725,498.27	0.70	9,717.40	-101.31	

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Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
22,138.00	89.00	359.41	11,887.91	9,665.47 N	1,023.05 W	514,179.87	725,498.25	0.70	9,719.39	-101.31	
22,140.00	89.00	359.40	11,887.95	9,667.47 N	1,023.07 W	514,181.87	725,498.23	0.70	9,721.38	-101.31	
22,142.00	89.00	359.38	11,887.98	9,669.47 N	1,023.09 W	514,183.87	725,498.21	0.70	9,723.37	-101.31	
22,144.00	88.99	359.37	11,888.02	9,671.47 N	1,023.11 W	514,185.87	725,498.19	0.70	9,725.36	-101.31	
22,146.00	88.99	359.36	11,888.05	9,673.47 N	1,023.13 W	514,187.87	725,498.17	0.70	9,727.35	-101.31	
22,148.00	88.99	359.34	11,888.09	9,675.47 N	1,023.16 W	514,189.87	725,498.14	0.70	9,729.35	-101.31	
22,150.00	88.99	359.33	11,888.13	9,677.47 N	1,023.18 W	514,191.87	725,498.12	0.70	9,731.34	-101.31	
22,152.00	88.98	359.31	11,888.16	9,679.47 N	1,023.20 W	514,193.87	725,498.10	0.70	9,733.33	-101.31	
22,154.00	88.98	359.30	11,888.20	9,681.47 N	1,023.23 W	514,195.87	725,498.07	0.70	9,735.32	-101.31	
22,156.00	88.98	359.29	11,888.23	9,683.47 N	1,023.25 W	514,197.87	725,498.05	0.70	9,737.31	-101.31	
22,158.00	88.97	359.27	11,888.27	9,685.47 N	1,023.28 W	514,199.87	725,498.02	0.70	9,739.30	-101.31	
22,160.00	88.97	359.26	11,888.30	9,687.47 N	1,023.30 W	514,201.87	725,498.00	0.70	9,741.30	-101.31	
22,162.00	88.97	359.25	11,888.34	9,689.47 N	1,023.33 W	514,203.87	725,497.97	0.70	9,743.29	-101.31	
22,164.00	88.97	359.23	11,888.38	9,691.47 N	1,023.36 W	514,205.87	725,497.94	0.70	9,745.28	-101.31	
22,166.00	88.96	359.22	11,888.41	9,693.47 N	1,023.38 W	514,207.87	725,497.92	0.70	9,747.27	-101.31	
22,168.00	88.96	359.20	11,888.45	9,695.47 N	1,023.41 W	514,209.87	725,497.89	0.70	9,749.26	-101.31	
22,170.00	88.96	359.19	11,888.48	9,697.47 N	1,023.44 W	514,211.87	725,497.86	0.70	9,751.26	-101.31	
22,172.00	88.96	359.18	11,888.52	9,699.47 N	1,023.47 W	514,213.87	725,497.83	0.70	9,753.25	-101.31	
22,174.00	88.95	359.16	11,888.56	9,701.47 N	1,023.50 W	514,215.87	725,497.80	0.70	9,755.24	-101.31	
22,176.00	88.95	359.15	11,888.59	9,703.47 N	1,023.53 W	514,217.87	725,497.77	0.70	9,757.23	-101.31	
22,178.00	88.98	359.20	11,888.63	9,705.47 N	1,023.55 W	514,219.87	725,497.75	2.64	9,759.22	59.52	
22,180.00	89.00	359.24	11,888.67	9,707.46 N	1,023.58 W	514,221.86	725,497.72	2.64	9,761.22	59.52	
22,182.00	89.03	359.29	11,888.70	9,709.46 N	1,023.61 W	514,223.86	725,497.69	2.64	9,763.21	59.52	
22,184.00	89.06	359.33	11,888.73	9,711.46 N	1,023.63 W	514,225.86	725,497.67	2.64	9,765.20	59.52	
22,186.00	89.08	359.38	11,888.77	9,713.46 N	1,023.65 W	514,227.86	725,497.65	2.64	9,767.19	59.52	
22,188.00	89.11	359.42	11,888.80	9,715.46 N	1,023.68 W	514,229.86	725,497.62	2.64	9,769.18	59.52	
22,190.00	89.14	359.47	11,888.83	9,717.46 N	1,023.69 W	514,231.86	725,497.61	2.64	9,771.17	59.52	
22,192.00	89.16	359.51	11,888.86	9,719.46 N	1,023.71 W	514,233.86	725,497.59	2.64	9,773.17	59.52	
22,194.00	89.19	359.56	11,888.89	9,721.46 N	1,023.73 W	514,235.86	725,497.57	2.64	9,775.16	59.52	
22,196.00	89.22	359.61	11,888.91	9,723.46 N	1,023.74 W	514,237.86	725,497.56	2.64	9,777.15	59.52	
22,198.00	89.24	359.65	11,888.94	9,725.46 N	1,023.76 W	514,239.86	725,497.54	2.64	9,779.14	59.51	
22,200.00	89.27	359.70	11,888.97	9,727.46 N	1,023.77 W	514,241.86	725,497.53	2.64	9,781.13	59.51	
22,202.00	89.30	359.74	11,888.99	9,729.46 N	1,023.78 W	514,243.86	725,497.52	2.64	9,783.12	59.51	
22,204.00	89.33	359.79	11,889.02	9,731.46 N	1,023.79 W	514,245.86	725,497.51	2.64	9,785.11	59.51	
22,206.00	89.35	359.83	11,889.04	9,733.46 N	1,023.79 W	514,247.86	725,497.51	2.64	9,787.10	59.51	
22,208.00	89.38	359.88	11,889.06	9,735.46 N	1,023.80 W	514,249.86	725,497.50	2.64	9,789.09	59.51	
22,210.00	89.41	359.92	11,889.08	9,737.46 N	1,023.80 W	514,251.86	725,497.50	2.64	9,791.08	59.51	



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Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
22,212.00	89.43	359.97	11,889.10	9,739.46 N	1,023.80 W	514,253.86	725,497.50	2.64	9,793.07	59.51	
22,214.00	89.46	0.02	11,889.12	9,741.46 N	1,023.80 W	514,255.86	725,497.50	2.64	9,795.06	59.51	
22,216.00	89.49	0.06	11,889.14	9,743.46 N	1,023.80 W	514,257.86	725,497.50	2.64	9,797.05	59.51	
22,218.00	89.51	0.11	11,889.16	9,745.46 N	1,023.80 W	514,259.86	725,497.50	2.64	9,799.04	59.51	
22,220.00	89.54	0.15	11,889.17	9,747.46 N	1,023.79 W	514,261.86	725,497.51	2.64	9,801.03	59.51	
22,222.00	89.57	0.20	11,889.19	9,749.46 N	1,023.79 W	514,263.86	725,497.51	2.64	9,803.02	59.51	
22,224.00	89.59	0.24	11,889.20	9,751.46 N	1,023.78 W	514,265.86	725,497.52	2.64	9,805.01	59.51	
22,226.00	89.62	0.29	11,889.22	9,753.46 N	1,023.77 W	514,267.86	725,497.53	2.64	9,806.99	59.51	
22,228.00	89.65	0.33	11,889.23	9,755.46 N	1,023.76 W	514,269.86	725,497.54	2.64	9,808.98	59.51	
22,230.00	89.67	0.38	11,889.24	9,757.46 N	1,023.75 W	514,271.86	725,497.55	2.64	9,810.97	59.51	
22,232.00	89.70	0.42	11,889.25	9,759.46 N	1,023.73 W	514,273.86	725,497.57	2.64	9,812.96	59.51	
22,234.00	89.73	0.47	11,889.26	9,761.46 N	1,023.72 W	514,275.86	725,497.58	2.64	9,814.95	59.51	
22,236.00	89.75	0.52	11,889.27	9,763.46 N	1,023.70 W	514,277.86	725,497.60	2.64	9,816.94	59.51	
22,238.00	89.78	0.56	11,889.28	9,765.46 N	1,023.68 W	514,279.86	725,497.62	2.64	9,818.92	59.51	
22,240.00	89.81	0.61	11,889.29	9,767.46 N	1,023.66 W	514,281.86	725,497.64	2.64	9,820.91	59.51	
22,242.00	89.83	0.65	11,889.29	9,769.46 N	1,023.64 W	514,283.86	725,497.66	2.64	9,822.90	59.51	
22,244.00	89.86	0.70	11,889.30	9,771.46 N	1,023.62 W	514,285.86	725,497.68	2.64	9,824.89	59.51	
22,246.00	89.89	0.74	11,889.30	9,773.46 N	1,023.59 W	514,287.86	725,497.71	2.64	9,826.87	59.51	
22,248.00	89.92	0.79	11,889.31	9,775.46 N	1,023.56 W	514,289.86	725,497.74	2.64	9,828.86	59.51	
22,250.00	89.94	0.83	11,889.31	9,777.46 N	1,023.54 W	514,291.86	725,497.76	2.64	9,830.85	59.51	
22,252.00	89.97	0.88	11,889.31	9,779.46 N	1,023.51 W	514,293.86	725,497.79	2.64	9,832.83	59.51	
22,254.00	90.00	0.93	11,889.31	9,781.46 N	1,023.47 W	514,295.86	725,497.83	2.64	9,834.82	59.51	
22,256.00	90.02	0.97	11,889.31	9,783.46 N	1,023.44 W	514,297.86	725,497.86	2.64	9,836.80	59.51	
22,258.00	90.05	1.02	11,889.31	9,785.46 N	1,023.41 W	514,299.86	725,497.89	2.64	9,838.79	59.51	
22,260.00	90.08	1.06	11,889.31	9,787.46 N	1,023.37 W	514,301.86	725,497.93	2.64	9,840.78	59.51	
22,262.00	90.10	1.11	11,889.30	9,789.46 N	1,023.33 W	514,303.86	725,497.97	2.64	9,842.76	59.51	
22,264.00	90.13	1.15	11,889.30	9,791.46 N	1,023.29 W	514,305.86	725,498.01	2.64	9,844.75	59.51	
22,266.00	90.16	1.20	11,889.30	9,793.46 N	1,023.25 W	514,307.86	725,498.05	2.64	9,846.73	59.51	
22,268.00	90.18	1.24	11,889.29	9,795.46 N	1,023.21 W	514,309.86	725,498.09	2.64	9,848.72	59.51	
22,270.00	90.21	1.29	11,889.28	9,797.46 N	1,023.16 W	514,311.86	725,498.14	2.64	9,850.70	59.51	
22,272.00	90.21	1.29	11,889.28	9,799.45 N	1,023.12 W	514,313.85	725,498.18	0.00	9,852.69	0.00	
22,274.00	90.22	1.29	11,889.27	9,801.45 N	1,023.07 W	514,315.85	725,498.23	0.42	9,854.67	-8.75	
22,276.00	90.22	1.29	11,889.26	9,803.45 N	1,023.03 W	514,317.85	725,498.27	0.21	9,856.66	-8.75	
22,278.00	90.23	1.29	11,889.25	9,805.45 N	1,022.98 W	514,319.85	725,498.32	0.21	9,858.64	-8.75	
22,280.00	90.23	1.29	11,889.24	9,807.45 N	1,022.94 W	514,321.85	725,498.36	0.21	9,860.63	-8.75	
22,282.00	90.23	1.29	11,889.24	9,809.45 N	1,022.89 W	514,323.85	725,498.41	0.21	9,862.61	-8.75	



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Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
22,284.00	90.24	1.29	11,889.23	9,811.45 N	1,022.85 W	514,325.85	725,498.45	0.21	9,864.59	-8.75	
22,286.00	90.24	1.28	11,889.22	9,813.45 N	1,022.81 W	514,327.85	725,498.49	0.21	9,866.58	-8.75	
22,288.00	90.25	1.28	11,889.21	9,815.45 N	1,022.76 W	514,329.85	725,498.54	0.21	9,868.56	-8.75	
22,290.00	90.25	1.28	11,889.20	9,817.45 N	1,022.72 W	514,331.85	725,498.58	0.21	9,870.55	-8.75	
22,292.00	90.26	1.28	11,889.19	9,819.45 N	1,022.67 W	514,333.85	725,498.63	0.21	9,872.53	-8.75	
22,294.00	90.26	1.28	11,889.18	9,821.45 N	1,022.63 W	514,335.85	725,498.67	0.21	9,874.52	-8.75	
22,296.00	90.26	1.28	11,889.18	9,823.45 N	1,022.58 W	514,337.85	725,498.72	0.21	9,876.50	-8.75	
22,298.00	90.27	1.28	11,889.17	9,825.45 N	1,022.54 W	514,339.85	725,498.76	0.21	9,878.49	-8.75	
22,300.00	90.27	1.28	11,889.16	9,827.45 N	1,022.49 W	514,341.85	725,498.81	0.21	9,880.47	-8.75	
22,302.00	90.28	1.28	11,889.15	9,829.45 N	1,022.45 W	514,343.85	725,498.85	0.21	9,882.46	-8.75	
22,304.00	90.28	1.28	11,889.14	9,831.45 N	1,022.40 W	514,345.85	725,498.90	0.21	9,884.44	-8.75	
22,306.00	90.28	1.28	11,889.13	9,833.45 N	1,022.36 W	514,347.85	725,498.94	0.21	9,886.43	-8.75	
22,308.00	90.29	1.28	11,889.12	9,835.45 N	1,022.31 W	514,349.85	725,498.99	0.21	9,888.41	-8.75	
22,310.00	90.29	1.28	11,889.11	9,837.44 N	1,022.27 W	514,351.84	725,499.03	0.21	9,890.40	-8.75	
22,312.00	90.30	1.28	11,889.10	9,839.44 N	1,022.22 W	514,353.84	725,499.08	0.21	9,892.38	-8.75	
22,314.00	90.30	1.28	11,889.09	9,841.44 N	1,022.18 W	514,355.84	725,499.12	0.21	9,894.36	-8.75	
22,316.00	90.30	1.28	11,889.08	9,843.44 N	1,022.14 W	514,357.84	725,499.16	0.21	9,896.35	-8.75	
22,318.00	90.31	1.27	11,889.07	9,845.44 N	1,022.09 W	514,359.84	725,499.21	0.21	9,898.33	-8.75	
22,320.00	90.31	1.27	11,889.05	9,847.44 N	1,022.05 W	514,361.84	725,499.25	0.21	9,900.32	-8.75	
22,322.00	90.32	1.27	11,889.04	9,849.44 N	1,022.00 W	514,363.84	725,499.30	0.21	9,902.30	-8.75	
22,324.00	90.32	1.27	11,889.03	9,851.44 N	1,021.96 W	514,365.84	725,499.34	0.21	9,904.29	-8.75	
22,326.00	90.33	1.27	11,889.02	9,853.44 N	1,021.91 W	514,367.84	725,499.39	0.21	9,906.27	-8.75	
22,328.00	90.33	1.27	11,889.01	9,855.44 N	1,021.87 W	514,369.84	725,499.43	0.21	9,908.26	-8.75	
22,330.00	90.33	1.27	11,889.00	9,857.44 N	1,021.82 W	514,371.84	725,499.48	0.21	9,910.24	-8.75	
22,332.00	90.34	1.27	11,888.99	9,859.44 N	1,021.78 W	514,373.84	725,499.52	0.21	9,912.23	-8.75	
22,334.00	90.34	1.27	11,888.97	9,861.44 N	1,021.74 W	514,375.84	725,499.56	0.21	9,914.21	-8.75	
22,336.00	90.35	1.27	11,888.96	9,863.44 N	1,021.69 W	514,377.84	725,499.61	0.21	9,916.20	-8.75	
22,338.00	90.35	1.27	11,888.95	9,865.44 N	1,021.65 W	514,379.84	725,499.65	0.21	9,918.18	-8.75	
22,340.00	90.35	1.27	11,888.94	9,867.44 N	1,021.60 W	514,381.84	725,499.70	0.21	9,920.17	-8.75	
22,342.00	90.36	1.27	11,888.93	9,869.44 N	1,021.56 W	514,383.84	725,499.74	0.21	9,922.15	-8.75	
22,344.00	90.36	1.27	11,888.91	9,871.44 N	1,021.51 W	514,385.84	725,499.79	0.21	9,924.14	-8.75	
22,346.00	90.37	1.27	11,888.90	9,873.44 N	1,021.47 W	514,387.84	725,499.83	0.21	9,926.12	-8.75	
22,348.00	90.37	1.27	11,888.89	9,875.43 N	1,021.43 W	514,389.83	725,499.87	0.21	9,928.10	-8.75	
22,350.00	90.38	1.26	11,888.87	9,877.43 N	1,021.38 W	514,391.83	725,499.92	0.21	9,930.09	-8.75	
22,352.00	90.38	1.26	11,888.86	9,879.43 N	1,021.34 W	514,393.83	725,499.96	0.21	9,932.07	-8.75	
22,354.00	90.38	1.26	11,888.85	9,881.43 N	1,021.29 W	514,395.83	725,500.01	0.21	9,934.06	-8.75	
22,356.00	90.39	1.26	11,888.83	9,883.43 N	1,021.25 W	514,397.83	725,500.05	0.21	9,936.04	-8.75	



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Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
22,358.00	90.39	1.26	11,888.82	9,885.43 N	1,021.21 W	514,399.83	725,500.09	0.21	9,938.03	-8.75	
22,360.00	90.40	1.26	11,888.81	9,887.43 N	1,021.16 W	514,401.83	725,500.14	0.21	9,940.01	-8.75	
22,362.00	90.40	1.26	11,888.79	9,889.43 N	1,021.12 W	514,403.83	725,500.18	0.21	9,942.00	-8.75	
22,364.00	90.40	1.26	11,888.78	9,891.43 N	1,021.07 W	514,405.83	725,500.23	0.21	9,943.98	-8.75	
22,366.00	90.41	1.26	11,888.77	9,893.43 N	1,021.03 W	514,407.83	725,500.27	0.21	9,945.97	-8.75	
22,368.00	90.41	1.26	11,888.75	9,895.43 N	1,020.99 W	514,409.83	725,500.31	0.21	9,947.95	-8.75	
22,370.00	90.42	1.26	11,888.74	9,897.43 N	1,020.94 W	514,411.83	725,500.36	0.21	9,949.94	-8.75	
22,372.00	90.42	1.26	11,888.72	9,899.43 N	1,020.90 W	514,413.83	725,500.40	0.21	9,951.92	-8.75	
22,374.00	90.42	1.26	11,888.71	9,901.43 N	1,020.85 W	514,415.83	725,500.45	0.21	9,953.91	-8.75	
22,376.00	90.43	1.26	11,888.69	9,903.43 N	1,020.81 W	514,417.83	725,500.49	0.21	9,955.89	-8.75	
22,378.00	90.43	1.26	11,888.68	9,905.43 N	1,020.77 W	514,419.83	725,500.53	0.21	9,957.88	-8.75	
22,380.00	90.44	1.26	11,888.66	9,907.43 N	1,020.72 W	514,421.83	725,500.58	0.21	9,959.86	-8.75	
22,382.00	90.44	1.25	11,888.65	9,909.43 N	1,020.68 W	514,423.83	725,500.62	0.21	9,961.85	-8.75	
22,384.00	90.45	1.25	11,888.63	9,911.43 N	1,020.63 W	514,425.83	725,500.67	0.21	9,963.83	-8.75	
22,386.00	90.45	1.25	11,888.62	9,913.42 N	1,020.59 W	514,427.82	725,500.71	0.21	9,965.81	-8.75	
22,388.00	90.45	1.25	11,888.60	9,915.42 N	1,020.55 W	514,429.82	725,500.75	0.21	9,967.80	-8.75	
22,390.00	90.46	1.25	11,888.58	9,917.42 N	1,020.50 W	514,431.82	725,500.80	0.21	9,969.78	-8.75	
22,392.00	90.46	1.25	11,888.57	9,919.42 N	1,020.46 W	514,433.82	725,500.84	0.21	9,971.77	-8.75	
22,394.00	90.47	1.25	11,888.55	9,921.42 N	1,020.42 W	514,435.82	725,500.88	0.21	9,973.75	-8.75	
22,396.00	90.47	1.25	11,888.54	9,923.42 N	1,020.37 W	514,437.82	725,500.93	0.21	9,975.74	-8.75	
22,398.00	90.47	1.25	11,888.52	9,925.42 N	1,020.33 W	514,439.82	725,500.97	0.21	9,977.72	-8.75	
22,400.00	90.48	1.25	11,888.50	9,927.42 N	1,020.28 W	514,441.82	725,501.02	0.21	9,979.71	-8.75	
22,402.00	90.48	1.25	11,888.49	9,929.42 N	1,020.24 W	514,443.82	725,501.06	0.21	9,981.69	-8.75	
22,404.00	90.49	1.25	11,888.47	9,931.42 N	1,020.20 W	514,445.82	725,501.10	0.21	9,983.68	-8.75	
22,406.00	90.49	1.25	11,888.45	9,933.42 N	1,020.15 W	514,447.82	725,501.15	0.21	9,985.66	-8.75	
22,408.00	90.49	1.25	11,888.43	9,935.42 N	1,020.11 W	514,449.82	725,501.19	0.21	9,987.65	-8.75	
22,410.00	90.50	1.25	11,888.42	9,937.42 N	1,020.07 W	514,451.82	725,501.23	0.21	9,989.63	-8.75	
22,412.00	90.50	1.24	11,888.40	9,939.42 N	1,020.02 W	514,453.82	725,501.28	0.21	9,991.62	-8.75	
22,414.00	90.51	1.24	11,888.38	9,941.42 N	1,019.98 W	514,455.82	725,501.32	0.21	9,993.60	-8.75	
22,416.00	90.51	1.24	11,888.36	9,943.42 N	1,019.94 W	514,457.82	725,501.36	0.21	9,995.59	-8.75	
22,418.00	90.52	1.24	11,888.35	9,945.42 N	1,019.89 W	514,459.82	725,501.41	0.21	9,997.57	-8.75	
22,420.00	90.52	1.24	11,888.33	9,947.42 N	1,019.85 W	514,461.82	725,501.45	0.21	9,999.56	-8.75	
22,422.00	90.52	1.24	11,888.31	9,949.41 N	1,019.81 W	514,463.81	725,501.49	0.21	10,001.54	-8.75	
22,424.00	90.53	1.24	11,888.29	9,951.41 N	1,019.76 W	514,465.81	725,501.54	0.21	10,003.53	-8.75	
22,426.00	90.53	1.24	11,888.27	9,953.41 N	1,019.72 W	514,467.81	725,501.58	0.21	10,005.51	-8.75	
22,428.00	90.54	1.24	11,888.25	9,955.41 N	1,019.68 W	514,469.81	725,501.62	0.21	10,007.49	-8.75	
22,430.00	90.54	1.24	11,888.24	9,957.41 N	1,019.63 W	514,471.81	725,501.67	0.21	10,009.48	-8.75	



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				Northing	Easting	Northing	Easting				
22,432.00	90.54	1.24	11,888.22	9,959.41 N	1,019.59 W	514,473.81	725,501.71	0.21	10,011.46	-8.75	
22,434.00	90.55	1.24	11,888.20	9,961.41 N	1,019.55 W	514,475.81	725,501.75	0.21	10,013.45	-8.75	
22,436.00	90.55	1.24	11,888.18	9,963.41 N	1,019.50 W	514,477.81	725,501.80	0.21	10,015.43	-8.75	
22,438.00	90.56	1.24	11,888.16	9,965.41 N	1,019.46 W	514,479.81	725,501.84	0.21	10,017.42	-8.75	
22,440.00	90.56	1.24	11,888.14	9,967.41 N	1,019.42 W	514,481.81	725,501.88	0.21	10,019.40	-8.75	
22,442.00	90.56	1.24	11,888.12	9,969.41 N	1,019.37 W	514,483.81	725,501.93	0.21	10,021.39	-8.75	
22,444.00	90.57	1.23	11,888.10	9,971.41 N	1,019.33 W	514,485.81	725,501.97	0.21	10,023.37	-8.75	
22,446.00	90.57	1.23	11,888.08	9,973.41 N	1,019.29 W	514,487.81	725,502.01	0.21	10,025.36	-8.75	
22,448.00	90.58	1.23	11,888.06	9,975.41 N	1,019.25 W	514,489.81	725,502.05	0.21	10,027.34	-8.75	
22,450.00	90.58	1.23	11,888.04	9,977.41 N	1,019.20 W	514,491.81	725,502.10	0.21	10,029.33	-8.75	
22,452.00	90.59	1.23	11,888.02	9,979.41 N	1,019.16 W	514,493.81	725,502.14	0.21	10,031.31	-8.75	
22,454.00	90.59	1.23	11,888.00	9,981.41 N	1,019.12 W	514,495.81	725,502.18	0.21	10,033.30	-8.75	
22,456.00	90.59	1.23	11,887.98	9,983.41 N	1,019.07 W	514,497.81	725,502.23	0.21	10,035.28	-8.75	
22,458.00	90.60	1.23	11,887.96	9,985.40 N	1,019.03 W	514,499.80	725,502.27	0.21	10,037.27	-8.75	
22,460.00	90.59	1.24	11,887.94	9,987.40 N	1,018.99 W	514,501.80	725,502.31	0.66	10,039.25	158.63	
22,462.00	90.56	1.25	11,887.92	9,989.40 N	1,018.94 W	514,503.80	725,502.36	1.52	10,041.24	160.35	
22,463.00	90.54	1.25	11,887.91	9,990.40 N	1,018.92 W	514,504.80	725,502.38	1.52	10,042.23	160.35	100HLC @ 22,463'MD
22,464.00	90.53	1.26	11,887.90	9,991.40 N	1,018.90 W	514,505.80	725,502.40	1.52	10,043.22	160.35	
22,466.00	90.50	1.27	11,887.88	9,993.40 N	1,018.86 W	514,507.80	725,502.44	1.52	10,045.21	160.35	
22,468.00	90.47	1.28	11,887.86	9,995.40 N	1,018.81 W	514,509.80	725,502.49	1.52	10,047.19	160.35	
22,470.00	90.44	1.29	11,887.85	9,997.40 N	1,018.77 W	514,511.80	725,502.53	1.52	10,049.18	160.35	
22,472.00	90.41	1.30	11,887.83	9,999.40 N	1,018.72 W	514,513.80	725,502.58	1.52	10,051.16	160.35	
22,474.00	90.38	1.31	11,887.82	10,001.40 N	1,018.68 W	514,515.80	725,502.62	1.52	10,053.14	160.35	
22,476.00	90.36	1.32	11,887.81	10,003.40 N	1,018.63 W	514,517.80	725,502.67	1.52	10,055.13	160.35	
22,478.00	90.33	1.33	11,887.79	10,005.40 N	1,018.58 W	514,519.80	725,502.72	1.52	10,057.11	160.35	
22,480.00	90.30	1.34	11,887.78	10,007.40 N	1,018.54 W	514,521.80	725,502.76	1.52	10,059.10	160.35	
22,482.00	90.27	1.35	11,887.77	10,009.40 N	1,018.49 W	514,523.80	725,502.81	1.52	10,061.08	160.35	
22,484.00	90.24	1.36	11,887.76	10,011.40 N	1,018.44 W	514,525.80	725,502.86	1.52	10,063.07	160.35	
22,486.00	90.21	1.37	11,887.76	10,013.40 N	1,018.40 W	514,527.80	725,502.90	1.52	10,065.05	160.35	
22,488.00	90.18	1.38	11,887.75	10,015.40 N	1,018.35 W	514,529.80	725,502.95	1.52	10,067.04	160.35	
22,490.00	90.15	1.39	11,887.74	10,017.40 N	1,018.30 W	514,531.80	725,503.00	1.52	10,069.02	160.35	
22,492.00	90.13	1.40	11,887.74	10,019.39 N	1,018.25 W	514,533.79	725,503.05	1.52	10,071.00	160.35	
22,494.00	90.10	1.41	11,887.73	10,021.39 N	1,018.20 W	514,535.79	725,503.10	1.52	10,072.99	160.35	
22,496.00	90.07	1.42	11,887.73	10,023.39 N	1,018.15 W	514,537.79	725,503.15	1.52	10,074.97	160.35	
22,498.00	90.04	1.43	11,887.73	10,025.39 N	1,018.10 W	514,539.79	725,503.20	1.52	10,076.96	160.35	Last MWD Svy @ 22498'MD
22,500.00	90.04	1.43	11,887.73	10,027.39 N	1,018.05 W	514,541.79	725,503.25	0.00	10,078.94	0.00	

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Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates (usft)		Map Coordinates (usft)		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing	Easting	Northing	Easting				
22,502.00	90.04	1.43	11,887.73	10,029.39 N	1,018.00 W	514,543.79	725,503.30	0.00	10,080.92	0.00	
22,504.00	90.04	1.43	11,887.72	10,031.39 N	1,017.95 W	514,545.79	725,503.35	0.00	10,082.91	0.00	
22,506.00	90.04	1.43	11,887.72	10,033.39 N	1,017.90 W	514,547.79	725,503.40	0.00	10,084.89	0.00	
22,508.00	90.04	1.43	11,887.72	10,035.39 N	1,017.85 W	514,549.79	725,503.45	0.00	10,086.88	0.00	
22,510.00	90.04	1.43	11,887.72	10,037.39 N	1,017.80 W	514,551.79	725,503.50	0.00	10,088.86	0.00	
22,512.00	90.04	1.43	11,887.72	10,039.39 N	1,017.75 W	514,553.79	725,503.55	0.00	10,090.84	0.00	
22,514.00	90.04	1.43	11,887.72	10,041.39 N	1,017.70 W	514,555.79	725,503.60	0.00	10,092.83	0.00	
22,516.00	90.04	1.43	11,887.72	10,043.39 N	1,017.65 W	514,557.79	725,503.65	0.00	10,094.81	0.00	
22,518.00	90.04	1.43	11,887.72	10,045.39 N	1,017.60 W	514,559.79	725,503.70	0.00	10,096.80	0.00	Projection to TD @ 22518'MD - 5 1/2" Casing

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates (usft)		Comment
		+N/-S	+E/-W	
18.00	18.00	0.00	0.00	18ft KB Offset
68.19	68.19	0.18	0.00	First Gyro @ 68.19'MD
865.98	865.93	5.21	-2.74	Last Gyro @ 865.98'MD
11,134.00	11,027.52	-727.52	-827.67	Tie-in @ 11134'MD
11,198.00	11,090.51	-735.12	-836.10	First MWD Svy @ 11198'MD
11,948.00	11,745.63	-479.41	-954.19	SLC @ 11,948'MD
12,070.00	11,813.86	-379.04	-965.17	100HLC @ 12,070'MD
17,278.00	11,889.32	4,807.36	-1,012.20	SLC @ 17,278'MD
22,463.00	11,887.91	9,990.40	-1,018.92	100HLC @ 22,463'MD
22,498.00	11,887.73	10,025.39	-1,018.10	Last MWD Svy @ 22498'MD
22,518.00	11,887.72	10,045.39	-1,017.60	Projection to TD @ 22518'MD

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin (usft)		Start TVD (usft)
				+N/_S	+E/-W	
Target	Tspot 12-13 311H PBHL	354.19	Slot	0.00	0.00	0.00

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Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys

Survey tool program

From (usft)	To (usft)	Survey/Plan	Survey Tool
18.00	865.98	Gyro (RKB Adjusted from 8ft)	3_Gyro-GC_Drill pipe
982.00	11,134.00	Intermediate	Superior
11,198.00	22,498.00	Production	MWD+IFR1+SAG+FDIR
22,518.00	22,518.00	Projection to TD	Superior
			MWD+IFR1+SAG+FDIR
			3_Blind

Casing Details

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (in)	Hole Diameter (in)
4,561.81	4,561.20	9 5/8" Casing	9.625	12.250
11,167.00	11,060.01	7 5/8" Liner	7.625	8.750
22,518.00	11,887.72	5 1/2" Casing	5.500	6.750

Design Targets

Target Name	Dip Angle	Dip Dir.	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
- hit/miss target	()	()	()	()	()	()	()		
- Shape									
()									

Directional Difficulty Index

Average Dogleg over Survey:	1.63 °/100ft	Maximum Dogleg over Survey:	24.83 °/100ft at 12,244.00 usft
Net Tortousity applicable to Plans:	0.92 °/100ft	Directional Difficulty Index:	6.923

Audit Info

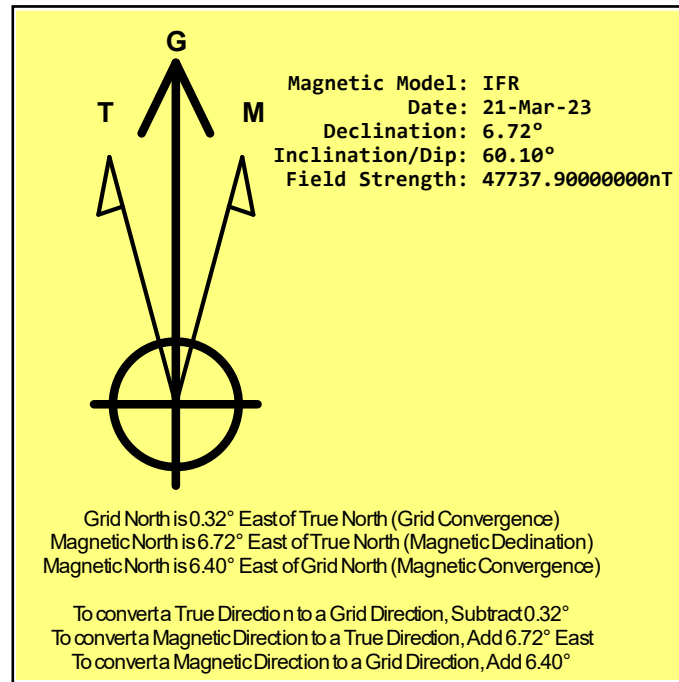
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North Reference Sheet for Top Spot 12-13 - Top Spot 12-13 Federal Com 311H - OH

All data is in US Feet unless otherwise stated. Directions and Coordinates are relative to Grid North Reference.
 Vertical Depths are relative to GL 3567.2' + RKB 26' @ 3593.20usft (H&P 419). Northing and Easting are relative to Top Spot 12-13 Federal Com 311H
 Coordinate System is US State Plane 1983, New Mexico Eastern Zone using datum North American Datum 1983, ellipsoid GRS 1980
 Projection method is Transverse Mercator (Gauss-Kruger)
 Central Meridian is 104° 20' 0.000 W°, Longitude Origin:0° 0' 0.000 E°, Latitude Origin:0° 0' 0.000 N°
 False Easting: 541,337.50usft, False Northing: 0.00usft, Scale Reduction: 0.99994837

Grid Coordinates of Well: 504,514.40 usft N, 726,521.30 usft E
 Geographical Coordinates of Well: 32° 23' 7.985 N, 103° 44' 0.326 W
 Grid Convergence at Surface is: 0.32°

Based upon Minimum Curvature type calculations, at a Measured Depth of 22,518.00usft
 the Bottom Hole Displacement is 10,096.80usft in the Direction of 354.22° (Grid).
 Magnetic Convergence at surface is: -6.40° (21 March 2023, , IFR)

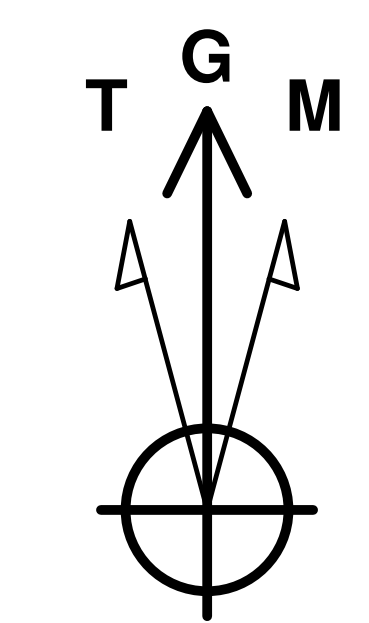




Final Plan Vs Actual

Project: Eddy County, NM (NAD83)
Site: Top Spot 12-13
Well: Top Spot 12-13 Federal Com 311H
Wellbore: OH
Design: Plan 1
Rig: H&P 419

Map System: US State Plane 1983
Datum: North American Datum 1983
Ellipsoid: GRS 1980
Zone Name: New Mexico Eastern Zone

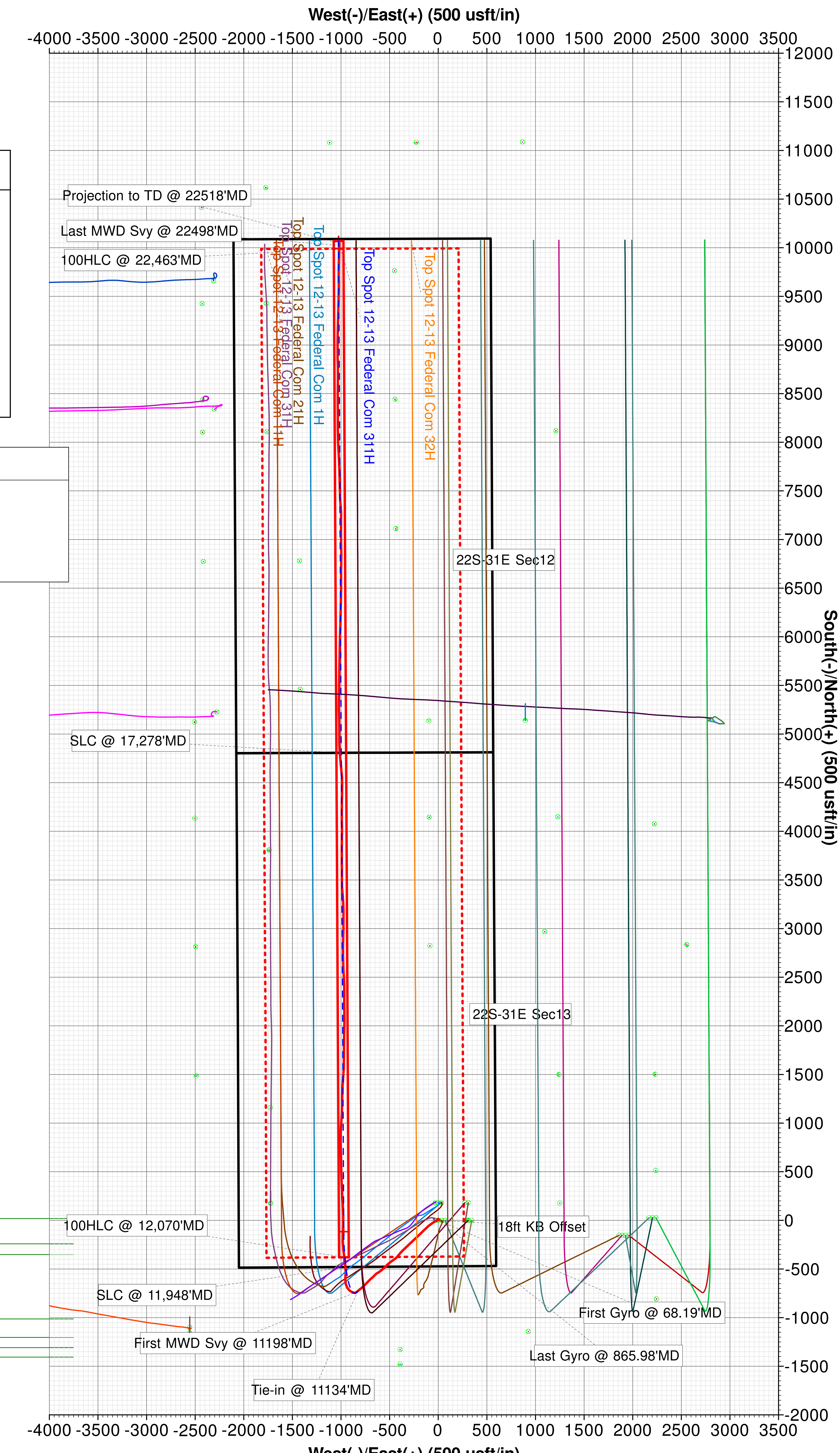
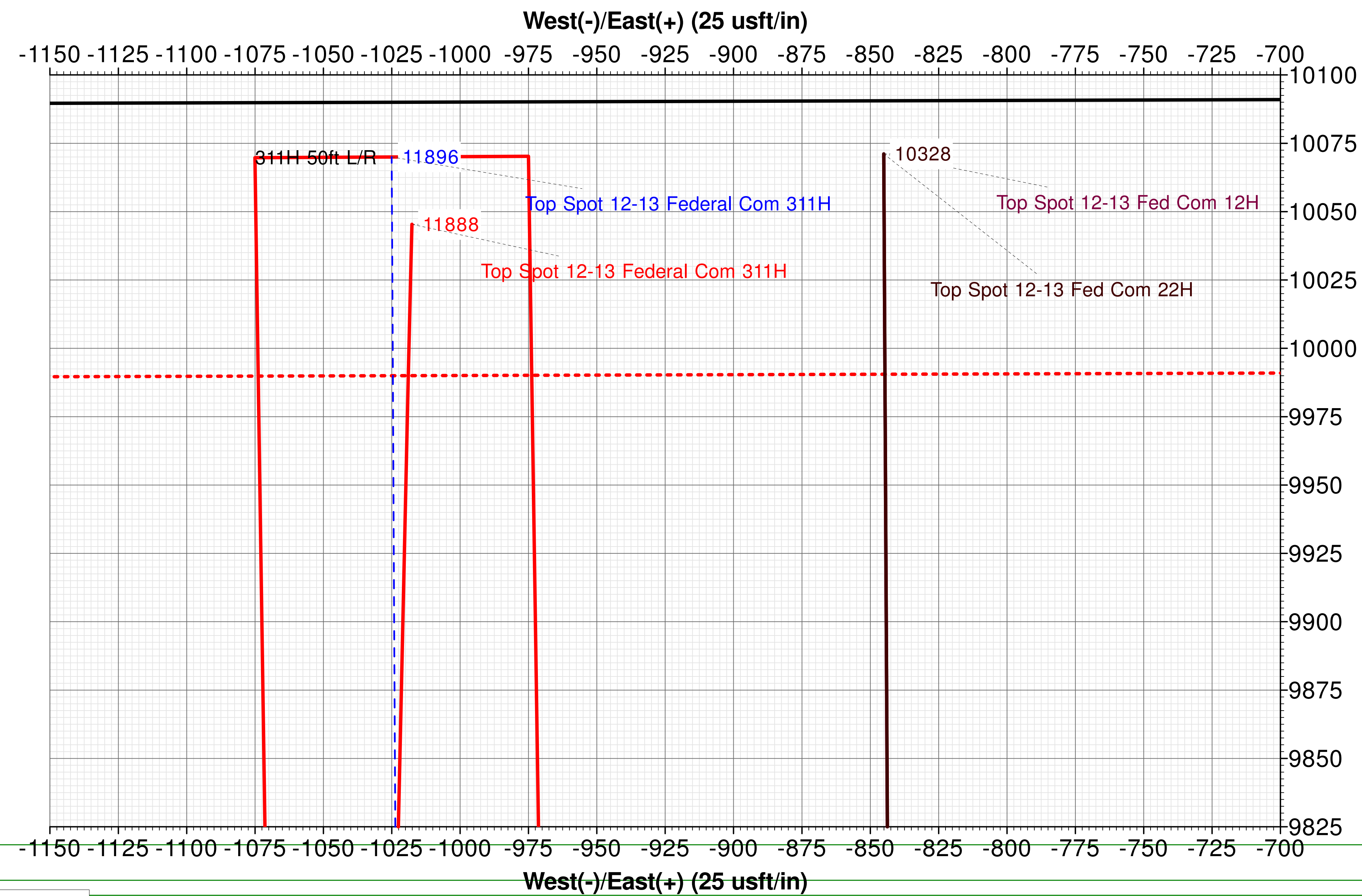
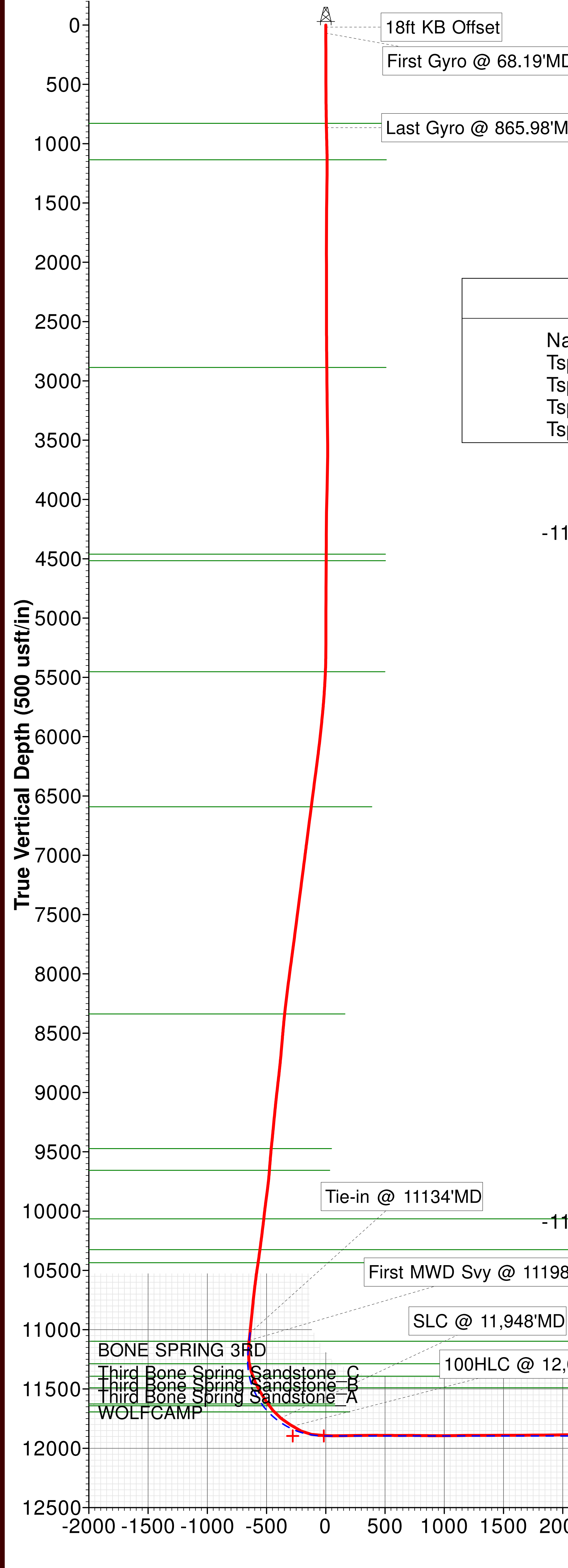


Azimuths to Grid North
True North: -0.32°
Magnetic North: 6.40°
Magnetic Field Strength: 47737.9nT
Dip Angle: 60.10°
Date: 3/21/2023
Model: IFR

WELL DETAILS table with columns: +N/-S, +E/-W, Northing, Easting, Latitude, Longitude. Values: 0.00, 0.00, 504514.40, 726521.30, 32° 23' 7.985 N, 103° 44' 0.326 W

FINAL SURVEY ANNOTATIONS table with columns: MD, Inc, Azi, TVD, +N/-S, +E/-W, VSect, Departure, Annotation. Includes entries like 18ft KB Offset, First Gyro @ 68.19'MD, Last Gyro @ 865.98'MD

DESIGN TARGET DETAILS table with columns: Name, TVD, +N/-S, +E/-W, Northing, Easting, Latitude, Longitude. Lists targets like Tspot 12-13 311H FTP, LndPt, LTP, PBHL



H&P 419

Occidental Petroleum Corporation

Eddy County, NM (NAD83) Top Spot 12-13

API# 30-015-47627

Top Spot 12-13 Federal Com 311H

OH

Design: Final Surveys

Sperry Drilling Services

Combo Report

31 March, 2023

Well Coordinates: 32° 23' 7.985 N
103° 44' 0.326 W

North American Datum 1983
New Mexico Eastern Zone
504,514.40 N
726,521.30 E

Ground Level: 3,567.20 usft

Local Coordinate Origin:

Centered on Well Top Spot 12-13 Federal Com 311H

Viewing Datum:

GL 3567.2' + RKB 26' @ 3593.20usft (H&P 419)

TVDs to System:

N

North Reference:

Grid

Unit System:

API-US Survey Feet

Compass Version: 5000.15 Build: 91E

Report Version: Midcon Combo v1.15

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Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
0.00	0.00	0.00	0.00	0.00 N	0.00 E	504,514.40	726,521.30	0.00	0.00	0.00	
18.00	0.00	0.00	18.00	0.00 N	0.00 E	504,514.40	726,521.30	0.00	0.00	0.00	18ft KB Offset
68.19	0.42	358.94	68.19	0.18 N	0.00 W	504,514.58	726,521.30	0.84	0.18	358.94	First Gyro @ 68.19'MD
122.28	0.10	327.95	122.28	0.42 N	0.03 W	504,514.82	726,521.27	0.63	0.42	-171.24	
205.14	0.08	6.80	205.14	0.54 N	0.06 W	504,514.94	726,521.24	0.08	0.54	126.91	
297.62	0.14	23.46	297.62	0.71 N	0.01 W	504,515.11	726,521.29	0.07	0.71	36.56	
391.87	0.19	12.17	391.87	0.97 N	0.07 E	504,515.37	726,521.37	0.06	0.96	-38.76	
486.12	0.28	20.59	486.12	1.34 N	0.18 E	504,515.74	726,521.48	0.10	1.31	25.24	
580.40	0.35	29.86	580.40	1.80 N	0.41 E	504,516.20	726,521.71	0.09	1.75	40.75	
674.68	0.70	336.97	674.67	2.58 N	0.32 E	504,516.98	726,521.62	0.60	2.53	-82.61	
768.86	1.29	304.18	768.84	3.71 N	0.78 W	504,518.11	726,520.52	0.85	3.77	-61.17	
865.98	1.63	310.27	865.93	5.21 N	2.74 W	504,519.61	726,518.56	0.38	5.46	27.60	Last Gyro @ 865.98'MD
982.00	1.78	322.45	981.90	7.71 N	5.09 W	504,522.11	726,516.21	0.34	8.18	73.68	
1,076.00	1.24	325.85	1,075.86	9.71 N	6.55 W	504,524.11	726,514.75	0.58	10.32	172.28	
1,171.00	0.25	86.26	1,170.86	10.57 N	6.92 W	504,524.97	726,514.38	1.46	11.22	171.03	
1,266.00	0.89	135.05	1,265.85	10.06 N	6.20 W	504,524.46	726,515.10	0.79	10.64	63.33	
1,361.00	1.11	132.60	1,360.84	8.92 N	5.00 W	504,523.32	726,516.30	0.24	9.38	-12.23	
1,455.00	0.96	134.55	1,454.82	7.75 N	3.77 W	504,522.15	726,517.53	0.16	8.09	167.76	
1,550.00	1.21	121.39	1,549.80	6.67 N	2.34 W	504,521.07	726,518.96	0.37	6.87	-51.61	
1,739.00	0.72	257.05	1,738.79	5.36 N	1.80 W	504,519.76	726,519.50	0.95	5.52	163.73	
1,929.00	0.66	268.23	1,928.78	5.06 N	4.05 W	504,519.46	726,517.25	0.08	5.45	119.54	
2,024.00	0.66	278.98	2,023.77	5.13 N	5.14 W	504,519.53	726,516.16	0.13	5.62	95.37	
2,119.00	0.99	265.05	2,118.76	5.14 N	6.50 W	504,519.54	726,514.80	0.40	5.78	-38.38	
2,214.00	1.02	260.73	2,213.75	4.94 N	8.15 W	504,519.34	726,513.15	0.09	5.74	-70.57	
2,309.00	0.75	273.85	2,308.74	4.84 N	9.61 W	504,519.24	726,511.69	0.35	5.79	149.55	
2,498.00	0.67	270.73	2,497.72	4.94 N	11.95 W	504,519.34	726,509.35	0.05	6.12	-155.76	
2,593.00	0.37	299.71	2,592.72	5.10 N	12.77 W	504,519.50	726,508.53	0.41	6.37	152.63	
2,782.00	0.88	32.80	2,781.71	6.62 N	12.51 W	504,521.02	726,508.79	0.51	7.85	115.41	
2,877.00	0.80	53.38	2,876.70	7.63 N	11.58 W	504,522.03	726,509.72	0.33	8.76	114.99	
3,066.00	1.03	50.37	3,065.67	9.50 N	9.22 W	504,523.90	726,512.08	0.12	10.39	-13.31	
3,161.00	1.20	45.85	3,160.66	10.74 N	7.84 W	504,525.14	726,513.46	0.20	11.48	-29.63	
3,350.00	1.15	45.70	3,349.62	13.44 N	5.07 W	504,527.84	726,516.23	0.03	13.89	-176.55	
3,540.00	1.15	68.15	3,539.58	15.48 N	1.93 W	504,529.88	726,519.37	0.24	15.60	101.22	
3,635.00	1.06	100.90	3,634.56	15.67 N	0.19 W	504,530.07	726,521.11	0.66	15.61	114.26	
3,729.00	1.63	123.43	3,728.54	14.77 N	1.78 E	504,529.17	726,523.08	0.82	14.51	54.49	
3,824.00	1.45	146.55	3,823.50	13.02 N	3.57 E	504,527.42	726,524.87	0.68	12.59	117.50	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
3,919.00	1.21	190.68	3,918.48	11.03 N	4.05 E	504,525.43	726,525.35	1.08	10.57	124.61	
4,013.00	1.45	178.76	4,012.45	8.87 N	3.89 E	504,523.27	726,525.19	0.39	8.43	-55.12	
4,108.00	1.26	163.50	4,107.43	6.67 N	4.22 E	504,521.07	726,525.52	0.43	6.21	-125.26	
4,203.00	0.62	255.71	4,202.42	5.54 N	4.01 E	504,519.94	726,525.31	1.50	5.10	154.24	
4,297.00	0.68	243.73	4,296.41	5.17 N	3.02 E	504,519.57	726,524.32	0.16	4.83	-72.25	
4,392.00	0.42	223.24	4,391.41	4.66 N	2.28 E	504,519.06	726,523.58	0.34	4.41	-152.84	
4,486.00	0.81	229.31	4,485.40	3.98 N	1.54 E	504,518.38	726,522.84	0.42	3.80	12.53	
4,501.00	1.07	241.83	4,500.40	3.84 N	1.33 E	504,518.24	726,522.63	2.20	3.69	44.68	
4,652.00	1.33	250.66	4,651.37	2.60 N	1.56 W	504,517.00	726,519.74	0.21	2.74	39.89	
4,746.00	1.37	251.42	4,745.34	1.88 N	3.66 W	504,516.28	726,517.64	0.05	2.24	24.50	
4,841.00	1.15	251.24	4,840.32	1.21 N	5.64 W	504,515.61	726,515.66	0.23	1.77	-179.06	
4,936.00	1.01	249.94	4,935.30	0.62 N	7.33 W	504,515.02	726,513.97	0.15	1.35	-170.72	
5,030.00	1.01	257.53	5,029.29	0.15 N	8.91 W	504,514.55	726,512.39	0.14	1.05	93.79	
5,125.00	0.97	264.61	5,124.27	0.10 S	10.53 W	504,514.30	726,510.77	0.14	0.96	111.63	
5,220.00	1.12	261.83	5,219.26	0.31 S	12.25 W	504,514.09	726,509.05	0.17	0.93	-20.07	
5,315.00	2.08	247.88	5,314.22	1.09 S	14.77 W	504,513.31	726,506.53	1.08	0.41	-29.16	
5,409.00	4.67	241.10	5,408.05	3.58 S	19.70 W	504,510.82	726,501.60	2.78	-1.57	-12.16	
5,504.00	7.40	240.98	5,502.51	8.42 S	28.44 W	504,505.98	726,492.86	2.87	-5.50	-0.32	
5,598.00	8.60	240.09	5,595.60	14.86 S	39.82 W	504,499.54	726,481.48	1.28	-10.75	-6.33	
5,693.00	9.13	235.51	5,689.46	22.67 S	52.19 W	504,491.73	726,469.11	0.93	-17.27	-55.37	
5,788.00	10.84	234.98	5,783.02	32.07 S	65.72 W	504,482.33	726,455.58	1.80	-25.25	-3.34	
5,883.00	11.05	232.34	5,876.29	42.76 S	80.24 W	504,471.64	726,441.06	0.57	-34.41	-68.57	
5,977.00	11.09	232.24	5,968.54	53.80 S	94.52 W	504,460.60	726,426.78	0.05	-43.95	-25.69	
6,072.00	11.02	226.83	6,061.78	65.60 S	108.37 W	504,448.80	726,412.93	1.09	-54.29	-96.51	
6,167.00	11.97	227.81	6,154.88	78.43 S	122.29 W	504,435.97	726,399.01	1.02	-65.65	12.10	
6,261.00	12.05	226.59	6,246.82	91.72 S	136.64 W	504,422.68	726,384.66	0.28	-77.41	-73.11	
6,356.00	11.84	225.25	6,339.76	105.40 S	150.76 W	504,409.00	726,370.54	0.37	-89.59	-127.79	
6,451.00	12.00	226.46	6,432.71	119.06 S	164.85 W	504,395.34	726,356.45	0.31	-101.76	57.97	
6,545.00	11.89	225.65	6,524.68	132.56 S	178.85 W	504,381.84	726,342.45	0.21	-113.77	-123.67	
6,640.00	11.79	226.20	6,617.66	146.12 S	192.86 W	504,368.28	726,328.44	0.16	-125.84	131.81	
6,734.00	11.92	226.07	6,709.65	159.50 S	206.78 W	504,354.90	726,314.52	0.14	-137.74	-11.67	
6,829.00	11.85	226.16	6,802.62	173.07 S	220.88 W	504,341.33	726,300.42	0.08	-149.81	165.21	
6,923.00	11.80	226.11	6,894.62	186.41 S	234.77 W	504,327.99	726,286.53	0.05	-161.68	-168.44	
7,018.00	12.19	228.59	6,987.55	199.78 S	249.29 W	504,314.62	726,272.01	0.68	-173.51	54.10	
7,112.00	11.96	227.20	7,079.47	212.97 S	263.88 W	504,301.43	726,257.42	0.39	-185.15	-129.02	
7,302.00	11.83	224.81	7,265.39	240.16 S	292.05 W	504,274.24	726,229.25	0.27	-209.35	-105.95	
7,396.00	12.05	226.74	7,357.36	253.72 S	305.99 W	504,260.68	726,215.31	0.48	-221.43	62.09	



Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
7,491.00	12.16	227.06	7,450.24	267.33 S	320.53 W	504,247.07	726,200.77	0.14	-233.50	31.54	
7,680.00	11.96	227.20	7,635.07	294.20 S	349.47 W	504,220.20	726,171.83	0.11	-257.29	171.75	
7,775.00	11.82	225.26	7,728.03	307.73 S	363.61 W	504,206.67	726,157.69	0.45	-269.33	-110.25	
7,964.00	11.14	220.88	7,913.26	335.16 S	389.31 W	504,179.24	726,131.99	0.58	-294.02	-130.09	
8,153.00	10.53	220.28	8,098.89	362.14 S	412.42 W	504,152.26	726,108.88	0.33	-318.52	-169.82	
8,343.00	10.61	225.90	8,285.67	387.56 S	436.21 W	504,126.84	726,085.09	0.54	-341.40	88.33	
8,437.00	10.44	232.39	8,378.09	398.78 S	449.17 W	504,115.62	726,072.13	1.27	-351.25	101.34	
8,532.00	10.86	235.47	8,471.45	409.11 S	463.36 W	504,105.29	726,057.94	0.74	-360.08	55.10	
8,627.00	9.88	235.92	8,564.90	418.75 S	477.49 W	504,095.65	726,043.81	1.04	-368.24	175.50	
8,722.00	9.91	234.21	8,658.49	428.10 S	490.87 W	504,086.30	726,030.43	0.31	-376.19	-85.01	
8,911.00	10.53	226.43	8,844.50	449.51 S	516.57 W	504,064.89	726,004.73	0.80	-394.89	-69.67	
9,006.00	9.80	222.24	8,938.01	461.48 S	528.30 W	504,052.92	725,993.00	1.09	-405.61	-136.68	
9,101.00	9.70	224.35	9,031.63	473.19 S	539.33 W	504,041.21	725,981.97	0.39	-416.14	106.67	
9,195.00	9.85	228.56	9,124.27	484.17 S	550.89 W	504,030.23	725,970.41	0.78	-425.90	80.23	
9,290.00	9.69	230.97	9,217.89	494.59 S	563.19 W	504,019.81	725,958.11	0.46	-435.01	112.55	
9,384.00	9.78	229.43	9,310.54	504.76 S	575.40 W	504,009.64	725,945.90	0.29	-443.90	-71.69	
9,479.00	10.49	230.07	9,404.06	515.56 S	588.17 W	503,998.84	725,933.13	0.76	-453.35	9.33	
9,574.00	10.37	233.75	9,497.49	526.17 S	601.69 W	503,988.23	725,919.61	0.71	-462.53	102.02	
9,668.00	10.61	239.12	9,589.92	535.61 S	615.94 W	503,978.79	725,905.36	1.07	-470.48	78.86	
9,724.00	10.35	240.23	9,644.98	540.75 S	624.73 W	503,973.65	725,896.57	0.59	-474.71	142.71	
9,819.00	10.88	232.26	9,738.36	550.48 S	639.23 W	503,963.92	725,882.07	1.64	-482.92	-74.10	
9,913.00	11.85	222.54	9,830.53	563.02 S	652.77 W	503,951.38	725,868.53	2.28	-494.03	-67.96	
10,008.00	11.79	226.85	9,923.52	576.85 S	666.45 W	503,937.55	725,854.85	0.93	-506.39	96.00	
10,103.00	11.15	228.80	10,016.62	589.54 S	680.44 W	503,924.86	725,840.86	0.79	-517.60	149.74	
10,198.00	10.76	225.37	10,109.89	601.82 S	693.67 W	503,912.58	725,827.63	0.80	-528.48	-122.57	
10,292.00	11.24	225.63	10,202.16	614.39 S	706.46 W	503,900.01	725,814.84	0.51	-539.69	6.03	
10,387.00	11.75	224.58	10,295.25	627.75 S	719.87 W	503,886.65	725,801.43	0.58	-551.63	-22.82	
10,482.00	12.51	223.97	10,388.13	642.05 S	733.80 W	503,872.35	725,787.50	0.81	-564.44	-9.87	
10,577.00	13.06	223.80	10,480.78	657.20 S	748.37 W	503,857.20	725,772.93	0.58	-578.04	-4.00	
10,671.00	11.99	226.74	10,572.54	671.56 S	762.83 W	503,842.84	725,758.47	1.32	-590.86	150.64	
10,766.00	10.85	226.88	10,665.66	684.43 S	776.55 W	503,829.97	725,744.75	1.20	-602.28	178.68	
10,861.00	10.86	231.04	10,758.96	696.17 S	790.03 W	503,818.23	725,731.27	0.82	-612.59	91.31	
10,955.00	10.29	231.70	10,851.36	706.94 S	803.51 W	503,807.46	725,717.79	0.62	-621.94	168.33	
11,050.00	10.25	229.09	10,944.84	717.73 S	816.55 W	503,796.67	725,704.75	0.49	-631.36	-96.20	
11,134.00	10.06	228.15	11,027.52	727.52 S	827.67 W	503,786.88	725,693.63	0.30	-639.97	-139.36	Tie-in @ 11134'MD
11,198.00	10.37	227.80	11,090.51	735.12 S	836.10 W	503,779.28	725,685.20	0.49	-646.68	-11.49	First MWD Svy @ 11198'MD
11,292.00	11.98	253.88	11,182.78	743.52 S	851.75 W	503,770.88	725,669.55	5.59	-653.45	85.42	



Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
11,386.00	21.67	287.16	11,272.84	741.10 S	877.82 W	503,773.30	725,643.48	14.15	-648.40	61.71	
11,480.00	24.84	310.27	11,359.38	723.17 S	909.54 W	503,791.23	725,611.76	10.20	-627.35	81.73	
11,574.00	26.17	327.80	11,444.34	692.82 S	935.69 W	503,821.58	725,585.61	8.13	-594.51	88.01	
11,666.00	30.79	347.27	11,525.35	652.58 S	951.74 W	503,861.82	725,569.56	11.21	-552.85	72.35	
11,760.00	33.84	2.96	11,604.93	602.87 S	955.69 W	503,911.53	725,565.61	9.47	-503.00	76.78	
11,855.00	40.15	2.48	11,680.77	545.80 S	953.00 W	503,968.60	725,568.30	6.65	-446.49	-2.81	
11,948.00	51.28	356.07	11,745.63	479.41 S	954.19 W	504,034.99	725,567.11	12.93	-380.32	-24.70	SLC @ 11,948'MD
11,950.00	51.52	355.96	11,746.88	477.85 S	954.30 W	504,036.55	725,567.00	12.93	-378.76	-20.20	
12,044.00	58.87	352.48	11,800.51	401.14 S	962.17 W	504,113.26	725,559.13	8.39	-301.65	-22.26	
12,070.00	59.32	352.07	11,813.86	379.04 S	965.17 W	504,135.36	725,556.13	2.21	-279.35	-38.15	100HLC @ 12,070'MD
12,139.00	60.53	350.99	11,848.44	319.98 S	973.97 W	504,194.42	725,547.33	2.21	-219.71	-37.94	
12,150.00	60.86	350.98	11,853.82	310.51 S	975.47 W	504,203.89	725,545.83	3.00	-210.13	-1.52	
12,244.00	82.42	0.47	11,883.32	222.15 S	981.61 W	504,292.25	725,539.69	24.83	-121.60	24.37	
12,339.00	87.44	1.83	11,891.71	127.57 S	979.71 W	504,386.83	725,541.59	5.47	-27.71	15.17	
12,425.00	88.50	0.93	11,894.76	41.65 S	977.64 W	504,472.75	725,543.66	1.62	57.56	-40.33	
12,520.00	92.16	358.66	11,894.21	53.32 N	977.98 W	504,567.72	725,543.32	4.53	152.08	-31.81	
12,614.00	90.21	357.83	11,892.27	147.25 N	980.85 W	504,661.65	725,540.45	2.25	245.82	-156.94	
12,709.00	90.73	356.23	11,891.49	242.12 N	985.78 W	504,756.52	725,535.52	1.77	340.70	-71.99	
12,804.00	89.87	357.43	11,890.99	336.97 N	991.03 W	504,851.37	725,530.27	1.55	435.59	125.62	
12,899.00	89.32	358.35	11,891.66	431.90 N	994.53 W	504,946.30	725,526.77	1.13	530.39	120.88	
12,993.00	90.09	358.30	11,892.15	525.86 N	997.27 W	505,040.26	725,524.03	0.82	624.14	-3.72	
13,088.00	90.13	359.19	11,891.96	620.83 N	999.36 W	505,135.23	725,521.94	0.94	718.84	87.43	
13,183.00	88.90	358.47	11,892.77	715.81 N	1,001.30 W	505,230.21	725,520.00	1.50	813.53	-149.66	
13,278.00	89.95	358.98	11,893.72	810.78 N	1,003.41 W	505,325.18	725,517.89	1.23	908.22	25.91	
13,373.00	89.86	2.24	11,893.88	905.76 N	1,002.40 W	505,420.16	725,518.90	3.43	1,002.61	91.58	
13,468.00	91.53	4.22	11,892.73	1,000.60 N	997.05 W	505,515.00	725,524.25	2.73	1,096.42	49.84	
13,562.00	90.01	2.23	11,891.46	1,094.43 N	991.76 W	505,608.83	725,529.54	2.66	1,189.23	-127.36	
13,657.00	90.12	1.02	11,891.36	1,189.39 N	989.07 W	505,703.79	725,532.23	1.28	1,283.43	-84.81	
13,752.00	90.04	1.40	11,891.22	1,284.37 N	987.06 W	505,798.77	725,534.24	0.41	1,377.72	101.89	
13,846.00	90.32	2.25	11,890.93	1,378.32 N	984.07 W	505,892.72	725,537.23	0.95	1,470.89	71.77	
13,941.00	89.87	5.73	11,890.77	1,473.07 N	977.46 W	505,987.47	725,543.84	3.69	1,564.48	97.36	
14,036.00	90.44	1.24	11,890.51	1,567.87 N	971.68 W	506,082.27	725,549.62	4.76	1,658.21	-82.76	
14,130.00	91.24	359.78	11,889.14	1,661.86 N	970.85 W	506,176.26	725,550.45	1.77	1,751.63	-61.27	
14,225.00	89.50	1.17	11,888.52	1,756.85 N	970.06 W	506,271.25	725,551.24	2.34	1,846.05	141.37	
14,320.00	91.07	0.46	11,888.05	1,851.83 N	968.71 W	506,366.23	725,552.59	1.81	1,940.41	-24.33	
14,414.00	90.68	1.42	11,886.61	1,945.81 N	967.17 W	506,460.21	725,554.13	1.10	2,033.74	112.10	

HALLIBURTON**Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys**

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
14,509.00	88.84	0.63	11,887.01	2,040.79 N	965.47 W	506,555.19	725,555.83	2.11	2,128.06	-156.76	
14,604.00	89.12	359.15	11,888.70	2,135.77 N	965.65 W	506,650.17	725,555.65	1.59	2,222.57	-79.30	
14,699.00	88.23	359.09	11,890.90	2,230.73 N	967.11 W	506,745.13	725,554.19	0.94	2,317.20	-176.14	
14,793.00	89.45	1.07	11,892.80	2,324.70 N	966.98 W	506,839.10	725,554.32	2.47	2,410.67	58.38	
14,888.00	88.76	357.98	11,894.29	2,419.68 N	967.76 W	506,934.08	725,553.54	3.33	2,505.24	-102.61	
14,982.00	88.55	357.20	11,896.49	2,513.57 N	971.71 W	507,027.97	725,549.59	0.86	2,599.05	-105.08	
15,172.00	90.22	358.81	11,898.53	2,703.43 N	978.33 W	507,217.83	725,542.97	1.22	2,788.60	43.96	
15,266.00	92.32	0.04	11,896.45	2,797.39 N	979.27 W	507,311.79	725,542.03	2.59	2,882.18	30.34	
15,361.00	91.58	1.56	11,893.22	2,892.33 N	977.94 W	507,406.73	725,543.36	1.78	2,976.49	115.94	
15,456.00	91.96	1.92	11,890.28	2,987.24 N	975.06 W	507,501.64	725,546.24	0.55	3,070.62	43.43	
15,645.00	89.03	358.54	11,888.65	3,176.18 N	974.30 W	507,690.58	725,547.00	2.37	3,258.51	-130.90	
15,740.00	88.78	357.17	11,890.47	3,271.09 N	977.86 W	507,785.49	725,543.44	1.47	3,353.30	-100.36	
15,835.00	87.42	354.76	11,893.62	3,365.80 N	984.54 W	507,880.20	725,536.76	2.91	3,448.19	-119.49	
15,930.00	91.48	358.53	11,894.53	3,460.59 N	990.10 W	507,974.99	725,531.20	5.83	3,543.06	42.91	
16,024.00	92.24	0.50	11,891.48	3,554.53 N	990.89 W	508,068.93	725,530.41	2.25	3,636.60	68.86	
16,119.00	88.76	359.10	11,890.65	3,649.51 N	991.22 W	508,163.91	725,530.08	3.95	3,731.13	-158.08	
16,213.00	89.01	0.42	11,892.48	3,743.49 N	991.62 W	508,257.89	725,529.68	1.43	3,824.66	79.29	
16,308.00	90.37	359.46	11,892.99	3,838.49 N	991.72 W	508,352.89	725,529.58	1.75	3,919.18	-35.22	
16,403.00	91.15	1.83	11,891.73	3,933.47 N	990.65 W	508,447.87	725,530.65	2.63	4,013.56	71.77	
16,497.00	89.28	358.92	11,891.38	4,027.45 N	990.03 W	508,541.85	725,531.27	3.68	4,107.00	-122.71	
16,592.00	90.98	359.35	11,891.16	4,122.43 N	991.47 W	508,636.83	725,529.83	1.85	4,201.64	14.19	
16,687.00	90.64	1.10	11,889.82	4,217.42 N	991.09 W	508,731.82	725,530.21	1.88	4,296.10	100.98	
16,782.00	89.63	359.42	11,889.59	4,312.41 N	990.66 W	508,826.81	725,530.64	2.06	4,390.56	-121.01	
16,876.00	90.77	2.07	11,889.27	4,406.40 N	989.44 W	508,920.80	725,531.86	3.07	4,483.94	66.72	
16,971.00	89.73	359.33	11,888.85	4,501.38 N	988.28 W	509,015.78	725,533.02	3.08	4,578.32	-110.78	
17,066.00	89.94	354.65	11,889.13	4,596.22 N	993.27 W	509,110.62	725,528.03	4.93	4,673.18	-87.44	
17,160.00	90.06	354.21	11,889.13	4,689.78 N	1,002.39 W	509,204.18	725,518.91	0.49	4,767.17	-74.74	
17,278.00	89.76	356.25	11,889.32	4,807.36 N	1,012.20 W	509,321.76	725,509.10	1.75	4,885.15	98.47	SLC @ 17,278'MD
17,350.00	89.57	357.50	11,889.74	4,879.25 N	1,016.12 W	509,393.65	725,505.18	1.75	4,957.07	98.47	
17,445.00	90.21	0.44	11,889.92	4,974.22 N	1,017.83 W	509,488.62	725,503.47	3.17	5,051.72	77.72	
17,634.00	89.32	358.56	11,890.70	5,163.21 N	1,019.48 W	509,677.61	725,501.82	1.10	5,239.90	-115.33	
17,728.00	90.90	359.33	11,890.52	5,257.19 N	1,021.21 W	509,771.59	725,500.09	1.87	5,333.57	25.98	
17,823.00	90.01	1.07	11,889.76	5,352.18 N	1,020.88 W	509,866.58	725,500.42	2.06	5,428.04	117.08	
17,917.00	89.72	0.53	11,889.98	5,446.17 N	1,019.56 W	509,960.57	725,501.74	0.65	5,521.42	-118.24	
18,106.00	89.79	0.98	11,890.79	5,635.15 N	1,017.07 W	510,149.55	725,504.23	0.24	5,709.17	81.16	
18,201.00	90.30	0.54	11,890.72	5,730.14 N	1,015.81 W	510,244.54	725,505.49	0.71	5,803.55	-40.79	
18,295.00	89.65	1.50	11,890.76	5,824.12 N	1,014.14 W	510,338.52	725,507.16	1.23	5,896.88	124.10	



Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
18,390.00	90.24	0.29	11,890.85	5,919.11 N	1,012.66 W	510,433.51	725,508.64	1.42	5,991.23	-64.01	
18,485.00	90.76	2.86	11,890.02	6,014.06 N	1,010.05 W	510,528.46	725,511.25	2.76	6,085.43	78.55	
18,579.00	89.56	1.76	11,889.76	6,107.98 N	1,006.26 W	510,622.38	725,515.04	1.73	6,178.48	-137.49	
18,674.00	90.21	0.30	11,889.95	6,202.96 N	1,004.55 W	510,717.36	725,516.75	1.68	6,272.80	-66.00	
18,769.00	91.33	2.25	11,888.67	6,297.92 N	1,002.44 W	510,812.32	725,518.86	2.37	6,367.06	60.12	
18,958.00	89.13	0.13	11,887.91	6,486.86 N	998.51 W	511,001.26	725,522.79	1.62	6,554.63	-136.05	
19,052.00	89.66	359.67	11,888.91	6,580.85 N	998.68 W	511,095.25	725,522.62	0.75	6,648.16	-40.96	
19,147.00	91.18	0.51	11,888.21	6,675.85 N	998.53 W	511,190.25	725,522.77	1.83	6,742.65	28.92	
19,242.00	90.17	1.04	11,887.09	6,770.83 N	997.24 W	511,285.23	725,524.06	1.20	6,837.01	152.31	
19,337.00	88.99	359.27	11,887.79	6,865.82 N	996.99 W	511,380.22	725,524.31	2.24	6,931.49	-123.69	
19,431.00	89.48	358.83	11,889.04	6,959.80 N	998.54 W	511,474.20	725,522.76	0.70	7,025.14	-41.92	
19,525.00	90.21	359.08	11,889.30	7,053.78 N	1,000.26 W	511,568.18	725,521.04	0.82	7,118.82	18.90	
19,714.00	89.14	1.39	11,890.37	7,242.76 N	999.48 W	511,757.16	725,521.82	1.35	7,306.74	114.86	
19,809.00	88.20	354.41	11,892.58	7,337.61 N	1,002.96 W	511,852.01	725,518.34	7.41	7,401.46	-97.74	
19,904.00	90.69	358.56	11,893.50	7,432.40 N	1,008.78 W	511,946.80	725,512.52	5.09	7,496.35	59.07	
19,998.00	88.90	358.52	11,893.83	7,526.37 N	1,011.18 W	512,040.77	725,510.12	1.90	7,590.08	-178.72	
20,093.00	89.63	358.39	11,895.05	7,621.33 N	1,013.74 W	512,135.73	725,507.56	0.78	7,684.80	-10.10	
20,188.00	90.53	358.14	11,894.92	7,716.28 N	1,016.61 W	512,230.68	725,504.69	0.98	7,779.56	-15.52	
20,377.00	87.09	357.00	11,898.84	7,905.04 N	1,024.62 W	512,419.44	725,496.68	1.92	7,968.16	-161.68	
20,566.00	91.75	358.72	11,900.76	8,093.84 N	1,031.68 W	512,608.24	725,489.62	2.63	8,156.70	20.27	
20,660.00	90.36	0.39	11,899.03	8,187.81 N	1,032.41 W	512,702.21	725,488.89	2.31	8,250.27	129.76	
20,755.00	89.94	359.31	11,898.78	8,282.81 N	1,032.66 W	512,797.21	725,488.64	1.22	8,344.81	-111.25	
20,850.00	89.88	0.14	11,898.93	8,377.81 N	1,033.11 W	512,892.21	725,488.19	0.88	8,439.36	94.14	
20,944.00	90.82	359.95	11,898.35	8,471.81 N	1,033.04 W	512,986.21	725,488.26	1.02	8,532.87	-11.43	
21,134.00	91.68	0.82	11,894.21	8,661.75 N	1,031.76 W	513,176.15	725,489.54	0.64	8,721.71	45.32	
21,323.00	89.44	357.87	11,892.36	8,850.70 N	1,033.92 W	513,365.10	725,487.38	1.96	8,909.90	-127.19	
21,418.00	91.33	0.26	11,891.72	8,945.67 N	1,035.47 W	513,460.07	725,485.83	3.21	9,004.54	51.66	
21,513.00	90.25	0.19	11,890.41	9,040.66 N	1,035.10 W	513,555.06	725,486.20	1.14	9,099.01	-176.29	
21,608.00	91.00	1.92	11,889.37	9,135.64 N	1,033.35 W	513,650.04	725,487.95	1.98	9,193.32	66.55	
21,797.00	89.80	1.06	11,888.06	9,324.56 N	1,028.44 W	513,838.96	725,492.86	0.78	9,380.77	-144.37	
21,987.00	90.88	1.69	11,886.93	9,514.50 N	1,023.88 W	514,028.90	725,497.42	0.66	9,569.27	30.25	
22,081.00	89.08	359.80	11,886.96	9,608.48 N	1,022.66 W	514,122.88	725,498.64	2.78	9,662.65	-133.60	
22,176.00	88.95	359.15	11,888.59	9,703.47 N	1,023.53 W	514,217.87	725,497.77	0.70	9,757.23	-101.32	
22,270.00	90.21	1.29	11,889.28	9,797.46 N	1,023.16 W	514,311.86	725,498.14	2.64	9,850.70	59.52	
22,459.00	90.60	1.23	11,887.95	9,986.40 N	1,019.01 W	514,500.80	725,502.29	0.21	10,038.26	-8.75	
22,463.00	90.54	1.25	11,887.91	9,990.40 N	1,018.92 W	514,504.80	725,502.38	1.52	10,042.23	160.35	100HLC @ 22,463'MD
22,498.00	90.04	1.43	11,887.73	10,025.39 N	1,018.10 W	514,539.79	725,503.20	1.52	10,076.96	160.35	Last MWD Svy @ 22498'MD

HALLIBURTON

Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates (usft)		Map Coordinates (usft)		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing	Easting	Northing	Easting				
22,518.00	90.04	1.43	11,887.72	10,045.39 N	1,017.60 W	514,559.79	725,503.70	0.00	10,096.80	0.00	Projection to TD @ 22518'MD

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	Local Coordinates +E/-W (usft)	Comment
18.00	18.00	0.00	0.00	18ft KB Offset
68.19	68.19	0.18	0.00	First Gyro @ 68.19'MD
865.98	865.93	5.21	-2.74	Last Gyro @ 865.98'MD
11,134.00	11,027.52	-727.52	-827.67	Tie-in @ 11134'MD
11,198.00	11,090.51	-735.12	-836.10	First MWD Svy @ 11198'MD
11,948.00	11,745.63	-479.41	-954.19	SLC @ 11,948'MD
12,070.00	11,813.86	-379.04	-965.17	100HLC @ 12,070'MD
17,278.00	11,889.32	4,807.36	-1,012.20	SLC @ 17,278'MD
22,463.00	11,887.91	9,990.40	-1,018.92	100HLC @ 22,463'MD
22,498.00	11,887.73	10,025.39	-1,018.10	Last MWD Svy @ 22498'MD
22,518.00	11,887.72	10,045.39	-1,017.60	Projection to TD @ 22518'MD

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin +N/_S (usft)	Origin +E/-W (usft)	Start TVD (usft)
Target	Tspot 12-13 311H PBHL	354.19	Slot	0.00	0.00	0.00

Survey tool program

From (usft)	To (usft)	Survey/Plan	Survey Tool
18.00	865.98	Gyro (RKB Adjusted from 8ft)	3_Gyro-GC_Drill pipe
982.00	11,134.00	Intermediate	Superior
11,198.00	22,498.00	Production	MWD+IFR1+SAG+FDIR
			Superior
22,518.00	22,518.00	Projection to TD	MWD+IFR1+SAG+FDIR
			3_Blind

HALLIBURTON

Design Report for Top Spot 12-13 Federal Com 311H - Final Surveys

Design Targets

Target Name	Dip	Dip	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
- hit/miss target	Angle	Dir.							
- Shape	0	0	0	0	0	0	0		
()									

Directional Difficulty Index

Average Dogleg over Survey:	1.63 °/100ft	Maximum Dogleg over Survey:	24.83 °/100ft at 12,244.00 usft
Net Tortousity applicable to Plans:	0.92 °/100ft	Directional Difficulty Index:	6.923

Audit Info

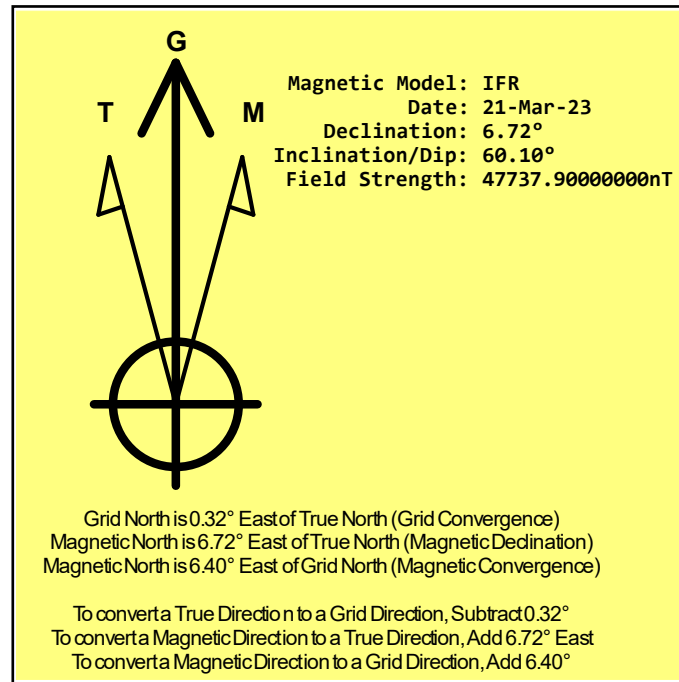
HALLIBURTON

North Reference Sheet for Top Spot 12-13 - Top Spot 12-13 Federal Com 311H - OH

All data is in US Feet unless otherwise stated. Directions and Coordinates are relative to Grid North Reference.
 Vertical Depths are relative to GL 3567.2' + RKB 26' @ 3593.20usft (H&P 419). Northing and Easting are relative to Top Spot 12-13 Federal Com 311H
 Coordinate System is US State Plane 1983, New Mexico Eastern Zone using datum North American Datum 1983, ellipsoid GRS 1980
 Projection method is Transverse Mercator (Gauss-Kruger)
 Central Meridian is 104° 20' 0.000 W°, Longitude Origin:0° 0' 0.000 E°, Latitude Origin:0° 0' 0.000 N°
 False Easting: 541,337.50usft, False Northing: 0.00usft, Scale Reduction: 0.99994837

Grid Coordinates of Well: 504,514.40 usft N, 726,521.30 usft E
 Geographical Coordinates of Well: 32° 23' 7.985 N, 103° 44' 0.326 W
 Grid Convergence at Surface is: 0.32°

Based upon Minimum Curvature type calculations, at a Measured Depth of 22,518.00usft
 the Bottom Hole Displacement is 10,096.80usft in the Direction of 354.22° (Grid).
 Magnetic Convergence at surface is: -6.40° (21 March 2023, , IFR)



Intent As Drilled

API # 30-015-47627		
Operator Name: OXY USA INC.	Property Name: Top Spot 12 13 Federal Com	Well Number 311H

Kick Off Point (KOP)

UL D	Section 24	Township 22S	Range 31E	Lot	Feet 261	From N/S North	Feet 1170	From E/W West	County Eddy
Latitude 32.38352793					Longitude -103.73628100			NAD Nad83	

First Take Point (FTP)

UL M	Section 13	Township 22S	Range 31E	Lot	Feet 141	From N/S South	Feet 1079	From E/W West	County Eddy
Latitude 32.38463496					Longitude -103.73657566			NAD Nad83	

Last Take Point (LTP)

UL D	Section 12	Township 22S	Range 31E	Lot	Feet 295	From N/S North	Feet 1081	From E/W West	County Eddy
Latitude 32.41248906					Longitude -103.73656156			NAD Nad83	

Is this well the defining well for the Horizontal Spacing Unit? Yes

Is this well an infill well? No

If infill is yes please provide API if available, Operator Name and well number for Defining well for Horizontal Spacing Unit.

API #		
Operator Name:	Property Name:	Well Number

KZ 06/29/2018

U.S. Department of the Interior
BUREAU OF LAND MANAGEMENT

Well Name: TOP SPOT 12_13 FED
COM

Well Location: T22S / R31E / SEC 13 /
SESW / 32.385552 / -103.7333424

County or Parish/State: EDDY /
NM

Well Number: 311H

Type of Well: OIL WELL

Allottee or Tribe Name:

Lease Number: NMNM29233

Unit or CA Name:

Unit or CA Number:

US Well Number: 3001547627

Well Status: Producing Oil Well

Operator: OXY USA
INCORPORATED

Subsequent Report

Sundry ID: 2739798

Type of Submission: Subsequent Report

Type of Action: Hydraulic Fracturing

Date Sundry Submitted: 07/07/2023

Time Sundry Submitted: 09:55

Date Operation Actually Began: 04/19/2023

Actual Procedure: RUPU 4/19/23, RIH & clean out to PBD @ 22496' , pressure test csg to 11300# for 30 min, good test. RIH & perf @ 12117'-22267' Total 1640 holes. Frac in 41 stages 30,868,970 #'s 100 Mesh Proppant and 401,212 bbls clean frac fluid, RD Frac Crew 5/13/2023. Rig Down Coil Tubing Clean Out Crew and Well ready to produce 5/18/2023. OXY USA Inc. requests a tubing exception while continuing to flow back this well. The estimated date of tubing install is 08/20/2023.

Well Name: TOP SPOT 12_13 FED
COM

Well Location: T22S / R31E / SEC 13 /
SESW / 32.385552 / -103.7333424

County or Parish/State: EDDY /
NM

Well Number: 311H

Type of Well: OIL WELL

Allottee or Tribe Name:

Lease Number: NMNM29233

Unit or CA Name:

Unit or CA Number:

US Well Number: 3001547627

Well Status: Producing Oil Well

Operator: OXY USA
INCORPORATED

Operator

I certify that the foregoing is true and correct. 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. Electronic submission of Sundry Notices through this system satisfies regulations requiring a

Operator Electronic Signature: SARAH MCKINNEY

Signed on: JUL 07, 2023 09:55 AM

Name: OXY USA INCORPORATED

Title: Regulatory Analyst Sr

Street Address: 5 GREENWAY PLAZA SUITE 110

City: HOUSTON

State: TX

Phone: (713) 215-7295

Email address: SARAH_MCKINNEY@OXY.COM

Field

Representative Name:

Street Address:

City:

State:

Zip:

Phone:

Email address:

BLM Point of Contact

BLM POC Name: JONATHON W SHEPARD

BLM POC Title: Petroleum Engineer

BLM POC Phone: 5752345972

BLM POC Email Address: jshepard@blm.gov

Disposition: Accepted

Disposition Date: 07/11/2023

Signature: Jonathon Shepard

Submit To Appropriate District Office Two Copies District I 1625 N. French Dr., Hobbs, NM 88240 District II 811 S. First St., Artesia, NM 88210 District III 1000 Rio Brazos Rd., Aztec, NM 87410 District IV 1220 S. St. Francis Dr., Santa Fe, NM 87505	State of New Mexico Energy, Minerals and Natural Resources Oil Conservation Division 1220 South St. Francis Dr. Santa Fe, NM 87505	Form C-105 Revised April 3, 2017 1. WELL API NO. 30-015-47627 2. Type of Lease <input type="checkbox"/> STATE <input type="checkbox"/> FEE <input checked="" type="checkbox"/> FED/INDIAN 3. State Oil & Gas Lease No. 329719
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WELL COMPLETION OR RECOMPLETION REPORT AND LOG

4. Reason for filing: <input checked="" type="checkbox"/> COMPLETION REPORT (Fill in boxes #1 through #31 for State and Fee wells only) <input type="checkbox"/> C-144 CLOSURE ATTACHMENT (Fill in boxes #1 through #9, #15 Date Rig Released and #32 and/or #33; attach this and the plat to the C-144 closure report in accordance with 19.15.17.13.K NMAC)	5. Lease Name or Unit Agreement Name Top Spot 12 13 Federal Com 6. Well Number: 311H
---	---

7. Type of Completion:
 NEW WELL WORKOVER DEEPENING PLUGBACK DIFFERENT RESERVOIR OTHER

8. Name of Operator OXY USA INC.	9. OGRID 16696
--	--------------------------

10. Address of Operator PO Box 50250, MIDLAND, TX 79710	11. Pool name or Wildcat WC 22S31E13; WOLFCAMP
---	--

12. Location	Unit Ltr	Section	Township	Range	Lot	Feet from the	N/S Line	Feet from the	E/W Line	County
Surface:	N	13	22S	31E		473	South	2052	West	Eddy
BH:	D	12	22S	31E		44	North	1088	West	Eddy

13. Date Spudded 10/27/2022	14. Date T.D. Reached 03/29/2023	15. Date Rig Released 04/01/2023	16. Date Completed (Ready to Produce) 05/18/2023	17. Elevations (DF and RKB, RT, GR, etc.) 3567'
18. Total Measured Depth of Well 22518' MD, 11887' TVD		19. Plug Back Measured Depth 22496' MD, 11887' TVD		20. Was Directional Survey Made? Yes
22. Producing Interval(s), of this completion - Top, Bottom, Name 12117-22267, Wolfcamp				21. Type Electric and Other Logs Run CBL/Gamma

23. CASING RECORD (Report all strings set in well)

CASING SIZE	WEIGHT LB./FT.	DEPTH SET	HOLE SIZE	CEMENTING RECORD	AMOUNT PULLED
13 3/8"	54.5# J55 BTC	885'	17 1/2"	1085sx - TOC 0'	
9 5/8"	40# HCL80	4566'	12 1/4"	1400sx - TOC 0'	
7 5/8"	26.4# HCL80	11167'	8 3/4"	331sx- TOC 9295'	
5 1/2"	20# P110	22498'	6 3/4"	215sx - TOC 10533'	

24. LINER RECORD				25. TUBING RECORD			
SIZE	TOP	BOTTOM	SACKS CEMENT	SCREEN	SIZE	DEPTH SET	PACKER SET

26. Perforation record (interval, size, and number) 12117-22267, 0.42", 1640 Holes	27. ACID, SHOT, FRACTURE, CEMENT, SQUEEZE, ETC. DEPTH INTERVAL AMOUNT AND KIND MATERIAL USED 12117-22267 30,868,970# 100 mesh, 401,212 bbls clean frac fluid.
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28. PRODUCTION

Date First Production 05/26/2023	Production Method (<i>Flowing, gas lift, pumping - Size and type pump</i>) Flowing	Well Status (<i>Prod. or Shut-in</i>) Producing
--	--	---

Date of Test 06/06/2023	Hours Tested 24 Hours	Choke Size 0	Prod'n For Test Period	Oil - Bbl 7137	Gas - MCF 10241	Water - Bbl. 6226	Gas - Oil Ratio 1435
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Flow Tubing Press.	Casing Pressure 2535	Calculated 24-Hour Rate	Oil - Bbl. 7137	Gas - MCF 10241	Water - Bbl. 6226	Oil Gravity - API - (<i>Corr.</i>)
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29. Disposition of Gas (<i>Sold, used for fuel, vented, etc.</i>) Sold	30. Test Witnessed By
--	-----------------------

31. List Attachments
C103, C104c, C102, WBD, Directional Survey, Log

32. If a temporary pit was used at the well, attach a plat with the location of the temporary pit.	33. Rig Release Date:
--	-----------------------

34. If an on-site burial was used at the well, report the exact location of the on-site burial:
 Latitude _____ Longitude _____ NAD83

I hereby certify that the information shown on both sides of this form is true and complete to the best of my knowledge and belief

Signature Printed Name **Sarah McKinney** Title **Regulatory Analyst Sr.** Date **06/22/2023**

E-mail Address **sarah_mckinney@oxy.com**

INSTRUCTIONS

This form is to be filed with the appropriate District Office of the Division not later than 20 days after the completion of any newly-drilled or deepened well and not later than 60 days after completion of closure. When submitted as a completion report, this shall be accompanied by one copy of all electrical and radio-activity logs run on the well and a summary of all special tests conducted, including drill stem tests. All depths reported shall be measured depths. In the case of directionally drilled wells, true vertical depths shall also be reported. For multiple completions, items 11, 12 and 26-31 shall be reported for each zone.

INDICATE FORMATION TOPS IN CONFORMANCE WITH GEOGRAPHICAL SECTION OF STATE

Southeastern New Mexico		Northwestern New Mexico	
T. Rustler 829'	T. Bell Canyon	T. Ojo Alamo	T. Penn A"
T. Salado 1136'	T. Strawn	T. Kirtland	T. Penn. "B"
T. Castile 2887'	T. Atoka	T. Fruitland	T. Penn. "C"
T. Delaware 4478'	T. Miss	T. Pictured Cliffs	T. Penn. "D"
T. Cherry Canyon 5356'	T. Devonian	T. Cliff House	T. Leadville
T. Brushy Canyon 6579'	T. Silurian	T. Menefee	T. Madison
T. Grayburg	T. Montoya	T. Point Lookout	T. Elbert
T. San Andres	T. Simpson	T. Mancos	T. McCracken
T. Glorieta	T. McKee	T. Gallup	T. Ignacio Otzte
T. Paddock	T. Ellenburger	Base Greenhorn	T. Granite
T. Blinebry	T. Gr. Wash	T. Dakota	
T. Tubb	T. Delaware Sand	T. Morrison	
T. Drinkard	T. Bone Springs 8424'	T. Todilto	
T. Abo	T. 1 st Bone Springs 9487'	T. Entrada	
T. Wolfcamp	T. 2 nd Bone Springs 10172'	T. Wingate	
T. Penn	T. 3 rd Bone Springs 11233'	T. Chinle	
T. Cisco (Bough C)	T. Wolfcamp 11792'	T. Permian	

OIL OR GAS SANDS OR ZONES

No. 1, from.....to.....
 No. 2, from.....to.....

No. 3, from.....to.....
 No. 4, from.....to.....

IMPORTANT WATER SANDS

Include data on rate of water inflow and elevation to which water rose in hole.

No. 1, from.....to.....feet.....
 No. 2, from.....to.....feet.....
 No. 3, from.....to.....feet.....

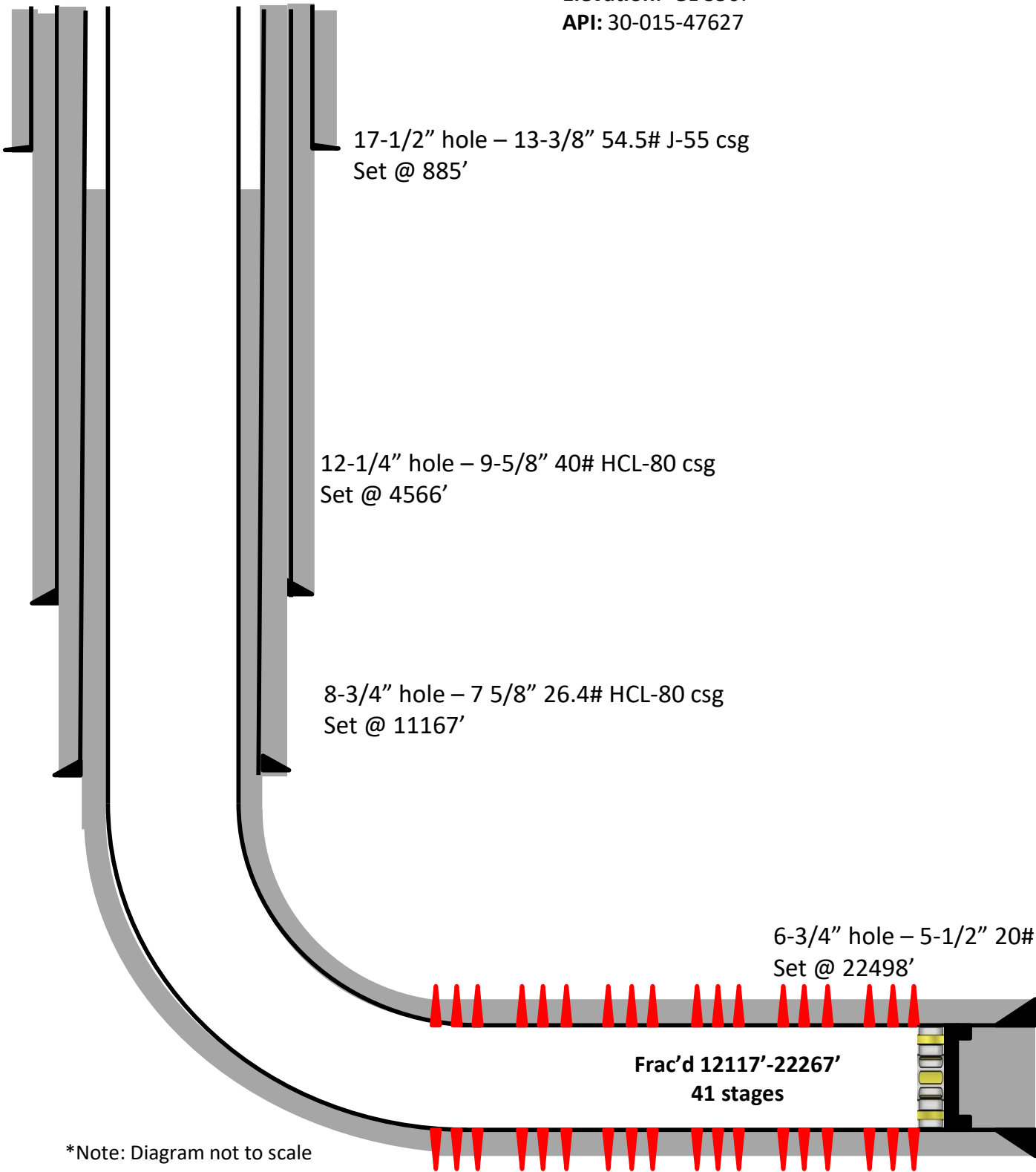
LITHOLOGY RECORD (Attach additional sheet if necessary)

From	To	Thickness In Feet	Lithology		From	To	Thickness In Feet	Lithology



Elevation: GL 3567'

API: 30-015-47627



17-1/2" hole – 13-3/8" 54.5# J-55 csg
Set @ 885'

12-1/4" hole – 9-5/8" 40# HCL-80 csg
Set @ 4566'

8-3/4" hole – 7 5/8" 26.4# HCL-80 csg
Set @ 11167'

6-3/4" hole – 5-1/2" 20# P-110 csg
Set @ 22498'

Frac'd 12117'-22267'
41 stages

*Note: Diagram not to scale

PBTD – 22496' MD

TD – 22518' MD/11887' TVD

District I
 1625 N. French Dr., Hobbs, NM 88240
 Phone:(575) 393-6161 Fax:(575) 393-0720

District II
 811 S. First St., Artesia, NM 88210
 Phone:(575) 748-1283 Fax:(575) 748-9720

District III
 1000 Rio Brazos Rd., Aztec, NM 87410
 Phone:(505) 334-6178 Fax:(505) 334-6170

District IV
 1220 S. St Francis Dr., Santa Fe, NM 87505
 Phone:(505) 476-3470 Fax:(505) 476-3462

State of New Mexico
Energy, Minerals and Natural Resources
Oil Conservation Division
1220 S. St Francis Dr.
Santa Fe, NM 87505

ACKNOWLEDGMENTS

Action 241471

ACKNOWLEDGMENTS

Operator: OXY USA INC P.O. Box 4294 Houston, TX 772104294	OGRID: 16696
	Action Number: 241471
	Action Type: [C-104] Completion Packet (C-104C)

ACKNOWLEDGMENTS

<input checked="" type="checkbox"/>	I hereby certify that the required Water Use Report has been, or will be, submitted for this wells completion.
<input checked="" type="checkbox"/>	I hereby certify that the required FracFocus disclosure has been, or will be, submitted for this wells completion.

District I
 1625 N. French Dr., Hobbs, NM 88240
 Phone:(575) 393-6161 Fax:(575) 393-0720
District II
 811 S. First St., Artesia, NM 88210
 Phone:(575) 748-1283 Fax:(575) 748-9720
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 1000 Rio Brazos Rd., Aztec, NM 87410
 Phone:(505) 334-6178 Fax:(505) 334-6170
District IV
 1220 S. St Francis Dr., Santa Fe, NM 87505
 Phone:(505) 476-3470 Fax:(505) 476-3462

State of New Mexico
Energy, Minerals and Natural Resources
Oil Conservation Division
1220 S. St Francis Dr.
Santa Fe, NM 87505

CONDITIONS

Action 241471

CONDITIONS

Operator: OXY USA INC P.O. Box 4294 Houston, TX 772104294	OGRID: 16696
	Action Number: 241471
	Action Type: [C-104] Completion Packet (C-104C)

CONDITIONS

Created By	Condition	Condition Date
plmartinez	File 3160-4 Completion Report within 10 days to NMOCD after BLM approval.	8/25/2023