



Railroad Commission of Texas
Oil and Gas Division
P.O. Box 12967
Capitol Station
Austin, TX 78711

October 19, 2017


Attn: Pam Johns

RE: Pioneer Natural Resources
University 7-43 #113H
Andrews County, TX
API #: 42-003-47567

Enclosed, please find the original and one copy of the survey performed on the referenced well by LEAM Drilling Services. (P-5 No. 491647). Other information required by your office is as follows:

<u>Name & Title of Surveyor</u>	<u>Drainhole Number</u>	<u>Surveyed Depths</u>	<u>Dates Performed</u>	<u>Type of Survey</u>
Randy W. Rakowitz (OH)		0' – 19,639'	08/30/2017 – 10/16/2017	MWD

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


Nora Tucker
Well Planner

Enclosures

LEAM Drilling Systems LLC

Survey Report

Company:	PIONEER NATURAL RESOURCES	Local Co-ordinate Reference:	Well University 7-43 113H - Slot Slot 13
Project:	Andrews County, TX	TVD Reference:	GE 2970' + KB 29' @ 2999.00usft (Patterson 802)
Site:	University 7-43	MD Reference:	GE 2970' + KB 29' @ 2999.00usft (Patterson 802)
Well:	University 7-43 113H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM 5000.1 MULTI User DB

Project	Andrews County, TX		
Map System:	US State Plane 1927 (Exact solution)	System Datum:	Mean Sea Level
Geo Datum:	NAD 1927 (NADCON CONUS)		
Map Zone:	Texas Central 4203		

Site		University 7-43,			
Site Position:		Northing:		981,655.23 usft	
From:		Easting:		1,404,840.76 usft	
Position Uncertainty:		Slot Radius:		Grid Convergence:	
Map		0.00 usft		13-3/16 "	
				32° 21' 5.0598 N	
				102° 15' 36.8474 W	
				-0.99 °	

Well	University 7-43 113H - Slot Slot 13, Site 1					
Well Position	+N-S	0.00 usft	Northing:	981,141.80 usft	Latitude:	32° 20' 59.8975 N
	+E-W	0.00 usft	Easting:	1,404,354.40 usft	Longitude:	102° 15' 42.4112 W
Position Uncertainty		0.00 usft	Wellhead Elevation:	0.00 usft	Ground Level:	2,970.00 usft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	8/23/2017	6.35	60.22	47,917

Design	OH				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)	
	0.00	0.00	0.00	169.80	

Survey Program	Date	10/19/2017			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
135.00	8,868.00	Survey #1 (OH)	LEAM MWD+HDGM	MWD+HDGM	
8,931.00	19,639.00	Survey #2 (OH)	MWD+IFR+MS	MWD + IFR + Multi Station	
19,639.00	19,639.00	Survey #3 (OH)	Project	Projection	

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
8,868.00	1.58	121.77	8,824.38	176.52	-592.36	-278.63	0.00	0.00	0.00	
8,931.00	1.32	121.07	8,887.36	175.68	-591.00	-277.57	0.41	-0.41	-1.11	
8,945.00	1.36	124.67	8,901.36	175.51	-590.73	-277.35	0.67	0.29	25.71	
9,039.00	6.73	163.70	8,995.10	169.58	-588.26	-271.08	6.10	5.71	41.52	
9,132.00	15.03	169.85	9,086.35	152.45	-584.60	-253.57	9.00	8.92	6.61	
9,226.00	23.16	172.05	9,175.10	122.09	-579.89	-222.86	8.68	8.65	2.34	
9,319.00	30.95	169.67	9,257.87	80.39	-573.06	-180.60	8.46	8.38	-2.56	

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Design:	OH	Database:	EDM 5000.1 MULTI User DB

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
9,413.00	39.87	168.88	9,334.40	26.94	-562.89	-126.20	9.50	9.49	-0.84	
9,506.00	46.99	166.16	9,401.90	-35.41	-548.99	-62.37	7.91	7.66	-2.92	
9,600.00	60.26	166.33	9,457.53	-108.76	-531.04	13.00	14.12	14.12	0.18	
9,693.00	64.70	169.41	9,500.49	-189.38	-513.76	95.40	5.60	4.77	3.31	
9,787.00	73.29	168.80	9,534.16	-275.46	-497.18	183.06	9.16	9.14	-0.65	
9,881.00	85.71	167.65	9,551.25	-365.76	-478.34	275.27	13.27	13.21	-1.22	
9,974.00	87.39	167.58	9,556.85	-456.43	-458.43	368.03	1.81	1.81	-0.08	
10,068.00	89.94	167.88	9,559.04	-548.25	-438.46	461.94	2.73	2.71	0.32	
10,162.00	89.14	168.83	9,559.80	-640.31	-419.49	555.90	1.32	-0.85	1.01	
10,255.00	91.03	166.83	9,559.66	-731.21	-399.88	648.84	2.96	2.03	-2.15	
10,349.00	90.36	166.30	9,558.52	-822.63	-378.04	742.68	0.91	-0.71	-0.56	
10,443.00	87.32	164.28	9,560.42	-913.52	-354.18	836.35	3.88	-3.23	-2.15	
10,536.00	88.44	163.83	9,563.86	-1,002.88	-328.65	928.82	1.30	1.20	-0.48	
10,630.00	90.34	165.63	9,564.86	-1,093.54	-303.90	1,022.44	2.78	2.02	1.91	
10,723.00	90.80	167.45	9,563.94	-1,183.98	-282.26	1,115.28	2.02	0.49	1.96	
10,817.00	90.54	167.31	9,562.84	-1,275.70	-261.72	1,209.19	0.31	-0.28	-0.15	
10,911.00	90.72	166.14	9,561.80	-1,367.19	-240.14	1,303.05	1.26	0.19	-1.24	
11,004.00	90.13	165.23	9,561.11	-1,457.29	-217.14	1,395.81	1.17	-0.63	-0.98	
11,098.00	89.05	165.00	9,561.79	-1,548.14	-193.00	1,489.49	1.17	-1.15	-0.24	
11,192.00	89.40	165.54	9,563.06	-1,639.04	-169.10	1,583.18	0.68	0.37	0.57	
11,285.00	89.50	164.76	9,563.95	-1,728.93	-145.27	1,675.87	0.85	0.11	-0.84	
11,379.00	90.28	164.75	9,564.13	-1,819.62	-120.55	1,769.51	0.83	0.83	-0.01	
11,472.00	91.01	166.23	9,563.08	-1,909.64	-97.25	1,862.24	1.77	0.78	1.59	
11,566.00	91.24	168.85	9,561.24	-2,001.40	-76.97	1,956.14	2.80	0.24	2.79	
11,659.00	91.05	166.20	9,559.38	-2,092.18	-56.89	2,049.04	2.86	-0.20	-2.85	
11,753.00	91.26	165.96	9,557.48	-2,183.40	-34.28	2,142.82	0.34	0.22	-0.26	
11,847.00	88.12	165.86	9,557.99	-2,274.56	-11.40	2,236.59	3.34	-3.34	-0.11	
11,940.00	86.60	165.51	9,562.28	-2,364.58	11.57	2,329.25	1.68	-1.63	-0.38	
12,034.00	90.17	165.94	9,564.92	-2,455.62	34.73	2,422.96	3.83	3.80	0.46	
12,127.00	90.42	167.74	9,564.45	-2,546.17	55.90	2,515.83	1.95	0.27	1.94	
12,221.00	91.52	169.45	9,562.85	-2,638.30	74.49	2,609.79	2.16	1.17	1.82	
12,315.00	89.99	166.90	9,561.62	-2,730.29	93.75	2,703.73	3.16	-1.63	-2.71	
12,408.00	89.21	168.13	9,562.27	-2,821.08	113.85	2,796.66	1.57	-0.84	1.32	
12,502.00	88.11	167.87	9,564.46	-2,913.00	133.39	2,890.58	1.20	-1.17	-0.28	
12,595.00	89.00	166.96	9,566.81	-3,003.74	153.65	2,983.47	1.37	0.96	-0.98	
12,689.00	88.25	165.51	9,569.06	-3,095.01	176.01	3,077.26	1.74	-0.80	-1.54	
12,782.00	91.70	167.17	9,569.10	-3,185.36	197.97	3,170.07	4.12	3.71	1.78	
12,876.00	92.61	167.49	9,565.57	-3,277.01	218.57	3,263.92	1.03	0.97	0.34	
12,969.00	93.07	168.08	9,560.96	-3,367.79	238.22	3,356.74	0.80	0.49	0.63	
13,063.00	90.13	166.39	9,558.34	-3,459.42	258.98	3,450.60	3.61	-3.13	-1.80	
13,156.00	86.11	164.16	9,561.39	-3,549.29	282.60	3,543.24	4.94	-4.32	-2.40	
13,250.00	87.11	163.63	9,566.95	-3,639.44	308.63	3,636.57	1.20	1.06	-0.56	

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Survey										
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13,344.00	89.60	166.74	9,569.65	-3,730.26	332.65	3,730.21	4.24	2.65	3.31	
13,437.00	90.87	168.57	9,569.26	-3,821.10	352.53	3,823.14	2.40	1.37	1.97	
13,531.00	89.05	166.19	9,569.33	-3,912.82	373.06	3,917.04	3.19	-1.94	-2.53	
13,625.00	88.96	166.50	9,570.96	-4,004.15	395.25	4,010.86	0.34	-0.10	0.33	
13,718.00	88.75	165.01	9,572.82	-4,094.27	418.13	4,103.61	1.62	-0.23	-1.60	
13,812.00	91.19	165.06	9,572.87	-4,185.08	442.40	4,197.27	2.60	2.60	0.05	
13,906.00	90.80	165.04	9,571.24	-4,275.88	466.65	4,290.94	0.42	-0.41	-0.02	
13,999.00	90.36	165.46	9,570.30	-4,365.81	490.33	4,383.64	0.65	-0.47	0.45	
14,093.00	89.44	164.90	9,570.46	-4,456.68	514.37	4,477.33	1.15	-0.98	-0.60	
14,187.00	89.86	168.61	9,571.03	-4,548.16	535.90	4,571.18	3.97	0.45	3.95	
14,281.00	89.58	168.62	9,571.49	-4,640.31	554.46	4,665.16	0.30	-0.30	0.01	
14,374.00	89.20	169.25	9,572.48	-4,731.58	572.30	4,758.14	0.79	-0.41	0.68	
14,468.00	91.04	171.73	9,572.29	-4,824.27	587.83	4,852.12	3.29	1.96	2.64	
14,561.00	89.82	168.98	9,571.59	-4,915.95	603.41	4,945.11	3.23	-1.31	-2.96	
14,655.00	88.47	167.78	9,572.99	-5,008.01	622.34	5,039.06	1.92	-1.44	-1.28	
14,749.00	87.95	168.29	9,575.93	-5,099.92	641.82	5,132.97	0.77	-0.55	0.54	
14,842.00	89.13	166.68	9,578.30	-5,190.68	661.97	5,225.86	2.15	1.27	-1.73	
14,936.00	89.52	164.65	9,579.41	-5,281.74	685.24	5,319.61	2.20	0.41	-2.16	
15,029.00	91.26	164.96	9,578.77	-5,371.48	709.61	5,412.25	1.90	1.87	0.33	
15,123.00	90.72	164.17	9,577.15	-5,462.08	734.62	5,505.84	1.02	-0.57	-0.84	
15,217.00	90.03	165.21	9,576.53	-5,552.74	759.44	5,599.46	1.33	-0.73	1.11	
15,310.00	90.42	166.77	9,576.17	-5,642.97	781.96	5,692.25	1.73	0.42	1.68	
15,404.00	92.02	169.39	9,574.17	-5,734.91	801.37	5,786.18	3.27	1.70	2.79	
15,497.00	90.70	167.31	9,571.96	-5,825.96	820.14	5,879.11	2.65	-1.42	-2.24	
15,592.00	88.59	166.31	9,572.55	-5,918.44	841.81	5,973.98	2.46	-2.22	-1.05	
15,685.00	90.33	167.96	9,573.42	-6,009.10	862.52	6,066.87	2.58	1.87	1.77	
15,779.00	90.85	168.61	9,572.46	-6,101.13	881.60	6,160.83	0.89	0.55	0.69	
15,873.00	89.80	168.70	9,571.92	-6,193.30	900.09	6,254.81	1.12	-1.12	0.10	
15,967.00	89.88	166.72	9,572.18	-6,285.14	920.10	6,348.74	2.11	0.09	-2.11	
16,055.00	90.46	166.77	9,571.92	-6,370.79	940.28	6,436.61	0.66	0.66	0.06	
16,149.00	91.20	167.21	9,570.56	-6,462.37	961.44	6,530.49	0.92	0.79	0.47	
16,243.00	90.97	166.05	9,568.78	-6,553.80	983.17	6,624.33	1.26	-0.24	-1.23	
16,337.00	92.06	166.50	9,566.30	-6,645.08	1,005.47	6,718.11	1.25	1.16	0.48	
16,430.00	90.12	164.77	9,564.53	-6,735.15	1,028.53	6,810.84	2.79	-2.09	-1.86	
16,524.00	90.05	162.40	9,564.39	-6,825.31	1,055.09	6,904.28	2.52	-0.07	-2.52	
16,618.00	90.23	163.51	9,564.16	-6,915.18	1,082.65	6,997.61	1.20	0.19	1.18	
16,712.00	91.25	165.19	9,562.94	-7,005.69	1,108.00	7,091.18	2.09	1.09	1.79	
16,805.00	90.09	165.05	9,561.86	-7,095.56	1,131.88	7,183.86	1.26	-1.25	-0.15	
16,899.00	90.30	165.38	9,561.54	-7,186.45	1,155.87	7,277.56	0.42	0.22	0.35	
16,993.00	91.99	167.61	9,559.66	-7,277.82	1,177.82	7,371.37	2.98	1.80	2.37	
17,087.00	91.11	168.89	9,557.12	-7,369.81	1,196.95	7,465.30	1.65	-0.94	1.36	
17,180.00	89.97	170.32	9,556.24	-7,461.28	1,213.73	7,558.29	1.97	-1.23	1.54	

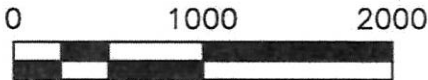
LEAM Drilling Systems LLC

Survey Report

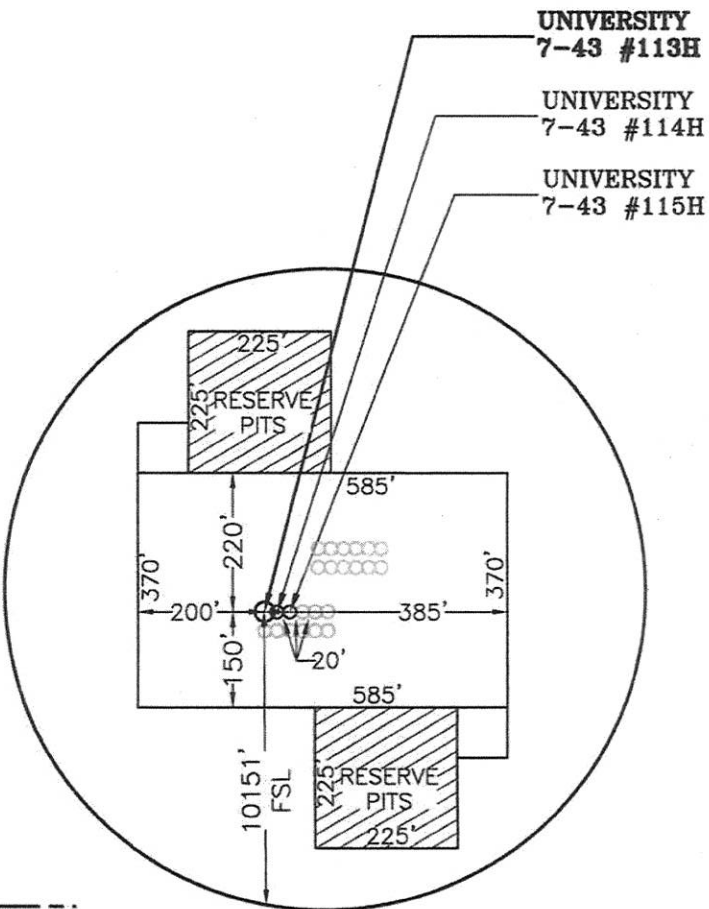
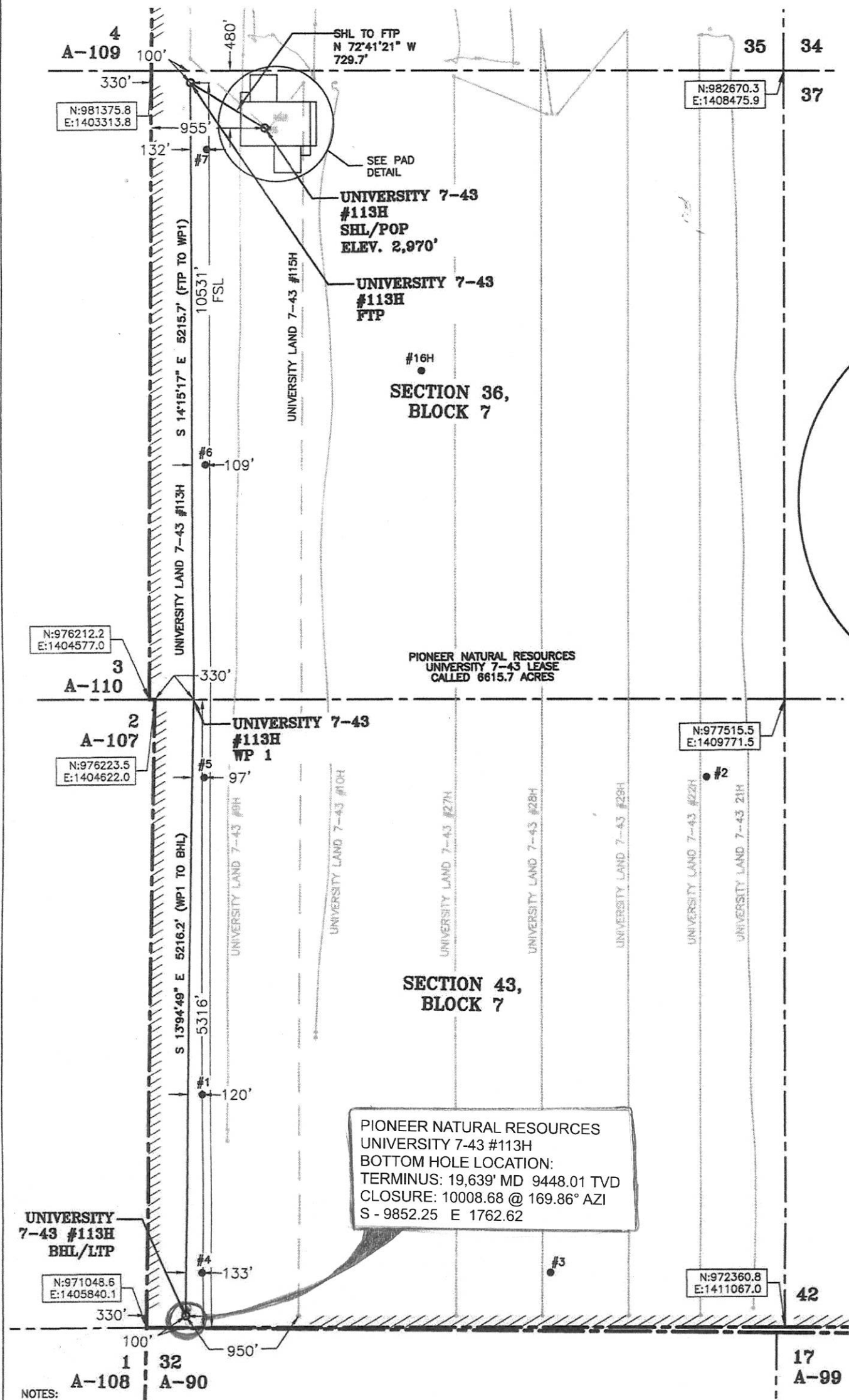
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17,274.00	88.22	168.21	9,557.72	-7,553.62	1,231.23	7,652.27	2.92	-1.86	-2.24	
17,368.00	87.97	167.97	9,560.85	-7,645.54	1,250.62	7,746.17	0.37	-0.27	-0.26	
17,461.00	88.57	168.65	9,563.66	-7,736.57	1,269.46	7,839.10	0.97	0.65	0.73	
17,555.00	90.54	170.37	9,564.39	-7,828.99	1,286.57	7,933.09	2.78	2.10	1.83	
17,648.00	89.97	167.29	9,563.97	-7,920.21	1,304.58	8,026.06	3.37	-0.61	-3.31	
17,742.00	89.96	166.76	9,564.03	-8,011.81	1,325.69	8,119.95	0.56	-0.01	-0.56	
17,835.00	90.33	167.13	9,563.79	-8,102.41	1,346.69	8,212.83	0.56	0.40	0.40	
17,929.00	92.24	165.27	9,561.69	-8,193.66	1,369.11	8,306.62	2.84	2.03	-1.98	
18,022.00	92.87	164.79	9,557.54	-8,283.42	1,393.11	8,399.20	0.85	0.68	-0.52	
18,116.00	93.19	164.28	9,552.57	-8,373.89	1,418.14	8,492.67	0.64	0.34	-0.54	
18,210.00	93.58	164.82	9,547.02	-8,464.33	1,443.13	8,586.11	0.71	0.41	0.57	
18,303.00	95.74	165.87	9,539.47	-8,554.00	1,466.59	8,678.52	2.58	2.32	1.13	
18,397.00	96.43	165.63	9,529.50	-8,644.60	1,489.59	8,771.76	0.78	0.73	-0.26	
18,491.00	92.07	163.70	9,522.54	-8,734.97	1,514.38	8,865.09	5.07	-4.64	-2.05	
18,584.00	93.27	164.84	9,518.20	-8,824.39	1,539.57	8,957.56	1.78	1.29	1.23	
18,678.00	93.05	164.98	9,513.02	-8,915.01	1,564.00	9,051.07	0.28	-0.23	0.15	
18,771.00	92.54	166.08	9,508.49	-9,004.95	1,587.21	9,143.70	1.30	-0.55	1.18	
18,865.00	94.63	167.28	9,502.61	-9,096.24	1,608.82	9,237.37	2.56	2.22	1.28	
18,959.00	97.01	168.15	9,493.08	-9,187.60	1,628.72	9,330.82	2.69	2.53	0.93	
19,052.00	97.75	168.25	9,481.13	-9,277.88	1,647.58	9,423.01	0.80	0.80	0.11	
19,145.00	95.93	168.75	9,470.06	-9,368.36	1,665.99	9,515.32	2.03	-1.96	0.54	
19,239.00	92.39	168.68	9,463.24	-9,460.29	1,684.33	9,609.04	3.77	-3.77	-0.07	
19,333.00	92.25	168.56	9,459.43	-9,552.36	1,702.87	9,702.95	0.20	-0.15	-0.13	
19,426.00	92.59	169.06	9,455.51	-9,643.51	1,720.90	9,795.85	0.65	0.37	0.54	
19,520.00	91.89	168.65	9,451.83	-9,735.67	1,739.05	9,889.76	0.86	-0.74	-0.44	
19,614.00	91.82	168.55	9,448.79	-9,827.77	1,757.62	9,983.69	0.13	-0.07	-0.11	
19,639.00	91.77	168.36	9,448.01	-9,852.25	1,762.62	10,008.67	0.79	-0.20	-0.76	
Projection										

WELL NAME	NORTHING (NAD27)	EASTING (NAD27)	LATITUDE (NAD 27)	LONGITUDE (NAD27)	SECTION LINE		LEASE LINE	
SURFACE HOLE LOCATION/POINT OF PENETRATION (SHL/POP)	981141.8	1404354.4	32.349971	102.261781	480' N (SEC. 36)	955' W (SEC. 36)	10151' S (SEC. 43)	955' W (SEC. 36)
FIRST TAKE POINT (FTP)	981358.9	1403657.8	32.350535	102.264048	100' N (SEC. 36)	330' W (SEC. 36)	10531' S (SEC. 43)	330' W (SEC. 36)
WAY POINT (WP1)	976303.8	1404942.1	32.336705	102.259608	0' S (SEC. 43)	330' W (SEC. 43)	5316' S (SEC. 43)	330' W (SEC. 43)
LAST TAKE POINT/BOTTOM HOLE LOCATION (LTP/BHL)	971226.3	1406137.3	32.322810	102.255455	100' S (SEC.43)	330' W (SEC. 43)	100' S (SEC. 43)	330' W (SEC. 43)



SCALE: 1" = 1000'



PAD DETAIL
SCALE: 1" = 300'



Hunter Wade Wills
5/22/17

NOTE: WELL IS LOCATED APPROXIMATELY 16.8 MILES EAST OF ANDREWS, ANDREWS COUNTY, TEXAS

NOTES:
THE BASIS OF BEARING OF THE SURVEY IS THE TEXAS COORDINATE SYSTEM, NORTH AMERICAN DATUM 1927 (NAD 27), CENTRAL ZONE (4203).
ALL TEXAS STATE PLANE COORDINATES SHOWN HEREON ARE NAD 27 GRID AND GEOGRAPHIC COORDINATES SHOWN HEREON WERE CONVERTED USING CORPSCON VERSION 6.0.1.
UNLESS OTHERWISE NOTED, ALL DISTANCES SHOWN HEREON ARE GRID DISTANCES AND THEY CAN BE CONVERTED TO SURFACE WHEN MULTIPLIED WITH A "SURFACE ADJUSTMENT FACTOR" OF 1.000188348 AS CALCULATED BY CORPSCON.
ELEVATIONS SHOWN HEREON ARE NAVD88 AS DERIVED BY GPS.
ALL MEASUREMENTS TO LEASE, UNIT, AND SURVEY LINES ARE PERPENDICULAR TO SAID LINES.
THIS SURVEY WAS PREPARED WITHOUT THE BENEFIT OF A TITLE REPORT.

DATED: 05/22/2017
BY: JERRAD KAUFFMAN
TBPLS FIRM NO. 10193998
HALFF ASSOCIATES INC. ENGINEERS - SURVEYORS
3300 N. A STREET, BLDG. 1 STE. 114,
MIDLAND, TX 79705
(432) 253-3255
SCALE: 1" = 1000' AVO 29678-WO284



LEGEND	
	PROPOSED WELL
	EXISTING WELL
	BLOCK LINE
	SECTION LINE
	LEASE LINE
	SUBJECT WELL LATERAL
	PROPOSED WELL BORE
	AS-DRILLED WELL BORE

PIONEER
NATURAL RESOURCES

WELL PLAT

UNIVERSITY 7-43 #113H

LOCATED IN
SECTION 36 & SECTION 43,
BLOCK 7,
UNIVERSITY LANDS SURVEY,
ANDREWS COUNTY, TEXAS



Survey Certification Form

State of Texas
Andrews County

I, Randy W. Rakowitz, certify that; I am employed by LEAM Drilling Services, that I did on the day(s) of 08/30/2017 through 10/16/2017, conduct or supervise the taking of MWD Survey from a depth of 0' MD to 19,639' MD; that the data is true, correct, complete and within the limitations of the tools as set forth by LEAM Drilling Services, that I am authorized and qualified to make this report; that this survey was conducted at the request of Pioneer Natural Resources for the University 7-43 #113H in Andrews County, Texas; and that I reviewed this report and find that it conforms to the principals and procedures as set forth by LEAM Drilling Services.

A handwritten signature in black ink, appearing to read "Randy W. Rakowitz", is written over a horizontal line.

Randy W. Rakowitz
MWD Operations Coordinator



LEAM Drilling Systems, LLC. 2027A Airport Rd., Conroe, TX 77301

Survey Report

MINIMUM CURVATURE CALCULATION

Operator: Pioneer Natural Resources

Well Name: University 7-43 113H

Location: Andrews County, TX

Start Date: 8/30/2017

End Date:

Direction: 169.80°

Survey Number	MD ft	INC °	AZM °	TVD ft	N-S ft	E-W ft	SECT ft	DLS %/100'	A/B ft	L/R ft
TIE IN	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
1	135	0.35	310.04	135.00	0.27	-0.32	-0.32	0.26		
2	226	0.26	24.04	226.00	0.63	-0.44	-0.70	0.41		
3	316	0.18	317.24	316.00	0.92	-0.46	-0.99	0.28		
4	406	0.09	306.17	406.00	1.07	-0.61	-1.16	0.10		
5	495	0.44	157.46	495.00	0.79	-0.54	-0.88	0.58		
6	585	0.35	259.41	585.00	0.42	-0.67	-0.54	0.68		
7	674	0.44	236.91	673.99	0.19	-1.23	-0.40	0.20		
8	769	0.35	277.69	768.99	0.03	-1.82	-0.35	0.30		
9	858	0.44	222.50	857.99	-0.19	-2.32	-0.23	0.42		
10	952	0.26	306.17	951.99	-0.33	-2.74	-0.16	0.52		
11	1045	0.18	63.94	1044.99	-0.14	-2.78	-0.35	0.41		
12	1139	0.44	126.34	1138.99	-0.29	-2.35	-0.13	0.42		
13	1233	0.44	102.44	1232.98	-0.58	-1.71	0.27	0.19		
14	1327	0.35	72.73	1326.98	-0.57	-1.08	0.37	0.23		
15	1420	0.44	130.21	1419.98	-0.72	-0.54	0.61	0.42		
16	1514	0.35	175.39	1513.98	-1.24	-0.24	1.18	0.33		
17	1608	0.70	272.42	1607.97	-1.50	-0.79	1.34	0.87		
18	1702	0.88	288.94	1701.97	-1.24	-2.05	0.86	0.31		
19	1795	0.97	298.61	1794.95	-0.63	-3.41	0.02	0.19		
20	1811	0.62	301.77	1810.95	-0.52	-3.61	-0.12	2.20		
21	1902	0.97	305.64	1901.94	0.19	-4.65	-1.01	0.39		
22	1996	2.20	290.00	1995.91	1.27	-6.99	-2.48	1.38		
23	2089	4.22	284.20	2088.76	2.72	-11.99	-4.80	2.20		
24	2183	6.24	287.71	2182.36	5.12	-20.21	-8.62	2.17		
25	2277	6.16	289.29	2275.81	8.34	-29.83	-13.49	0.20		
26	2370	5.98	290.35	2368.29	11.67	-39.09	-18.41	0.23		
27	2464	7.03	289.82	2461.68	15.33	-49.09	-23.78	1.12		
28	2558	8.97	291.75	2554.76	19.99	-61.31	-30.53	2.08		
29	2652	9.15	291.05	2647.59	25.39	-75.09	-38.29	0.22		
30	2746	9.15	291.93	2740.39	30.87	-89.00	-46.14	0.15		
31	2839	8.62	291.58	2832.28	36.19	-102.34	-53.74	0.57		
32	2933	8.09	292.46	2925.28	41.31	-115.00	-61.02	0.58		
33	3027	8.44	282.61	3018.31	45.34	-127.85	-67.27	1.55		
34	3120	8.71	278.57	3110.27	47.88	-141.47	-72.18	0.71		
35	3214	8.27	278.92	3203.24	49.99	-155.19	-76.68	0.47		
36	3308	7.91	280.50	3296.30	52.22	-168.23	-81.18	0.45		
37	3401	8.62	283.14	3388.34	54.97	-181.30	-86.21	0.87		
38	3495	9.06	284.02	3481.22	58.36	-195.35	-92.03	0.49		

39	3589	8.53	284.02	3574.11	61.85	-209.29	-97.93	0.56
40	3682	8.00	284.55	3666.15	65.14	-222.25	-103.47	0.58
41	3776	8.62	285.60	3759.16	68.68	-235.36	-109.27	0.68
42	3870	8.97	286.83	3852.06	72.70	-249.16	-115.67	0.42
43	3964	8.71	287.54	3944.94	76.96	-262.96	-122.31	0.30
44	4058	8.44	288.77	4037.89	81.33	-276.28	-128.97	0.35
45	4151	7.65	288.94	4129.97	85.53	-288.60	-135.29	0.85
46	4245	8.79	284.02	4223.01	89.30	-301.48	-141.28	1.42
47	4339	9.32	279.27	4315.84	92.27	-315.96	-146.76	0.97
48	4432	8.44	279.80	4407.72	94.64	-330.12	-151.61	0.95
49	4526	8.09	281.21	4500.74	97.10	-343.41	-156.38	0.43
50	4620	7.30	281.73	4593.90	99.60	-355.74	-161.03	0.84
51	4713	8.71	286.48	4685.99	102.80	-368.28	-166.40	1.67
52	4807	9.06	290.17	4778.86	107.37	-382.05	-173.33	0.71
53	4901	7.39	291.05	4871.89	112.10	-394.64	-180.21	1.78
54	4994	8.79	290.00	4963.96	116.68	-406.90	-186.89	1.51
55	5088	10.38	290.17	5056.65	122.05	-421.60	-194.78	1.69
56	5182	9.50	290.00	5149.24	127.63	-436.84	-202.97	0.94
57	5276	8.71	291.05	5242.05	132.84	-450.77	-210.56	0.86
58	5369	8.00	290.88	5334.06	137.67	-463.39	-217.56	0.76
59	5463	7.47	291.93	5427.21	142.29	-475.17	-224.18	0.58
60	5557	8.35	292.81	5520.31	147.21	-487.13	-231.15	0.94
61	5651	9.50	294.21	5613.17	153.04	-500.50	-239.25	1.24
62	5744	8.44	294.74	5705.04	159.05	-513.70	-247.50	1.14
63	5838	7.83	294.74	5798.09	164.61	-525.78	-255.12	0.65
64	5932	7.39	294.74	5891.26	169.82	-537.08	-262.25	0.47
65	6025	6.51	295.27	5983.58	174.58	-547.28	-268.73	0.95
66	6119	5.72	281.03	6077.05	177.75	-556.70	-273.52	1.81
67	6212	5.54	273.30	6169.60	178.89	-565.73	-276.25	0.84
68	6306	4.84	274.70	6263.21	179.48	-574.21	-278.33	0.76
69	6399	3.69	269.78	6355.95	179.79	-581.12	-279.85	1.30
70	6493	3.08	265.91	6449.79	179.60	-586.66	-280.65	0.69
71	6587	1.85	264.16	6543.70	179.26	-590.69	-281.03	1.31
72	6680	1.67	258.88	6636.66	178.85	-593.51	-281.12	0.26
73	6774	1.58	267.85	6730.62	178.53	-596.15	-281.28	0.29
74	6868	1.32	253.79	6824.59	178.18	-598.49	-281.35	0.47
75	6954	1.06	244.29	6910.57	177.56	-600.15	-281.03	0.38
76	7088	1.06	239.02	7044.55	176.39	-602.33	-280.26	0.07
77	7181	0.79	237.79	7137.54	175.60	-603.61	-279.72	0.29
78	7275	0.53	217.75	7231.53	174.91	-604.43	-279.18	0.37
79	7369	0.53	204.92	7325.53	174.17	-604.88	-278.54	0.13
80	7462	0.97	12.44	7418.52	174.55	-604.89	-278.91	1.60
81	7556	0.97	22.11	7512.51	176.07	-604.42	-280.32	0.17
82	7650	0.62	6.29	7606.50	177.31	-604.06	-281.48	0.44
83	7744	0.26	97.16	7700.50	177.79	-603.80	-281.90	0.72
84	7837	0.26	208.61	7793.50	177.58	-603.69	-281.67	0.46
85	7931	0.44	285.78	7887.50	177.49	-604.14	-281.67	0.49
86	8025	1.49	64.29	7981.49	178.12	-603.38	-282.15	1.96
87	8119	1.58	75.19	8075.45	178.98	-601.03	-282.58	0.32
88	8213	0.79	82.75	8169.43	179.39	-599.13	-282.65	0.85
89	8306	0.70	95.58	8262.42	179.42	-597.93	-282.47	0.20
90	8400	0.62	110.35	8356.42	179.18	-596.88	-282.05	0.20
91	8494	0.53	116.15	8450.41	178.82	-596.02	-281.54	0.11
92	8587	0.62	172.93	8543.41	178.13	-595.57	-280.78	0.59
93	8681	0.62	87.50	8637.41	177.64	-595.00	-280.20	0.89
94	8775	0.70	114.57	8731.40	177.43	-593.97	-279.81	0.34

95	8868	1.58	121.77	8824.38	176.52	-592.36	-278.62	0.96
96	8931	1.32	121.07	8887.36	175.68	-591.00	-277.57	0.41
97	8945	1.36	124.67	8901.36	175.51	-590.73	-277.34	0.67
98	9039	6.73	163.70	8995.10	169.58	-588.26	-271.07	6.10
99	9132	15.03	169.85	9086.35	152.45	-584.60	-253.56	9.00
100	9226	23.16	172.05	9175.10	122.09	-579.89	-222.85	8.68
101	9313	30.95	169.67	9252.53	83.08	-573.50	-183.32	9.04
102	9413	39.87	168.88	9334.40	26.94	-562.89	-126.19	9.50
103	9506	46.99	166.16	9401.90	-35.41	-548.99	-62.36	7.91
104	9600	60.26	166.33	9457.53	-108.76	-531.04	13.01	14.12
105	9693	64.70	169.41	9500.49	-189.38	-513.76	95.40	5.60
106	9787	73.29	168.80	9534.16	-275.46	-497.18	183.07	9.16
107	9881	85.71	167.65	9551.25	-365.76	-478.34	275.28	13.27
108	9974	87.39	167.58	9556.85	-456.43	-458.43	368.04	1.81
109	10068	89.94	167.88	9559.04	-548.25	-438.46	461.94	2.73
110	10162	89.14	168.83	9559.79	-640.31	-419.49	555.91	1.32
111	10255	91.03	166.83	9559.66	-731.21	-399.88	648.84	2.96
112	10349	90.36	166.30	9558.52	-822.63	-378.04	742.68	0.91
113	10443	87.32	164.28	9560.42	-913.52	-354.18	836.36	3.88
114	10536	88.44	163.83	9563.86	-1002.88	-328.65	928.83	1.30
115	10630	90.34	165.63	9564.86	-1093.54	-303.90	1022.45	2.78
116	10723	90.80	167.45	9563.94	-1183.98	-282.26	1115.29	2.02
117	10817	90.54	167.31	9562.84	-1275.70	-261.72	1209.20	0.31
118	10911	90.72	166.14	9561.80	-1367.19	-240.14	1303.05	1.26
119	11004	90.13	165.23	9561.11	-1457.29	-217.14	1395.81	1.17
120	11098	89.05	165.00	9561.79	-1548.14	-193.00	1489.49	1.17
121	11192	89.40	165.54	9563.06	-1639.04	-169.10	1583.19	0.68
122	11285	89.50	164.76	9563.95	-1728.93	-145.27	1675.88	0.85
123	11379	90.28	164.75	9564.13	-1819.62	-120.55	1769.51	0.83
124	11472	91.01	166.23	9563.08	-1909.64	-97.25	1862.24	1.77
125	11566	91.24	168.85	9561.24	-2001.40	-76.97	1956.14	2.80
126	11659	91.05	166.20	9559.38	-2092.18	-56.89	2049.04	2.86
127	11753	91.26	165.96	9557.48	-2183.40	-34.28	2142.82	0.34
128	11847	88.12	165.86	9557.99	-2274.56	-11.40	2236.59	3.34
129	11940	86.60	165.51	9562.28	-2364.58	11.57	2329.25	1.68
130	12034	90.17	165.94	9564.92	-2455.62	34.73	2422.96	3.83
131	12127	90.42	167.74	9564.45	-2546.17	55.90	2515.83	1.95
132	12221	91.52	169.45	9562.85	-2638.30	74.49	2609.79	2.16
133	12315	89.99	166.90	9561.62	-2730.29	93.75	2703.74	3.16
134	12408	89.21	168.13	9562.26	-2821.08	113.85	2796.66	1.57
135	12502	88.11	167.87	9564.46	-2913.00	133.39	2890.59	1.20
136	12595	89.00	166.96	9566.81	-3003.74	153.65	2983.47	1.37
137	12689	88.25	165.51	9569.06	-3095.01	176.01	3077.26	1.74
138	12782	91.70	167.17	9569.10	-3185.36	197.97	3170.07	4.12
139	12876	92.61	167.49	9565.57	-3277.01	218.57	3263.92	1.03
140	12969	93.07	168.08	9560.96	-3367.79	238.22	3356.75	0.80
141	13063	90.13	166.39	9558.34	-3459.42	258.98	3450.60	3.61
142	13156	86.11	164.16	9561.39	-3549.29	282.60	3543.24	4.94
143	13250	87.11	163.63	9566.95	-3639.44	308.63	3636.57	1.20
144	13344	89.60	166.74	9569.65	-3730.26	332.65	3730.21	4.24
145	13437	90.87	168.57	9569.26	-3821.10	352.53	3823.14	2.40
146	13531	89.05	166.19	9569.33	-3912.82	373.06	3917.05	3.19
147	13625	88.96	166.50	9570.96	-4004.15	395.25	4010.86	0.34
148	13718	88.75	165.01	9572.82	-4094.27	418.13	4103.61	1.62
149	13812	91.19	165.06	9572.87	-4185.08	442.40	4197.28	2.60
150	13906	90.80	165.04	9571.24	-4275.88	466.65	4290.94	0.42

151	13999	90.36	165.46	9570.30	-4365.81	490.33	4383.64	0.65
152	14093	89.44	164.90	9570.46	-4456.68	514.37	4477.33	1.15
153	14187	89.86	168.61	9571.03	-4548.16	535.90	4571.18	3.97
154	14281	89.58	168.62	9571.49	-4640.31	554.46	4665.16	0.30
155	14374	89.20	169.25	9572.48	-4731.58	572.30	4758.14	0.79
156	14468	91.04	171.73	9572.29	-4824.27	587.83	4852.13	3.29
157	14561	89.82	168.98	9571.59	-4915.95	603.41	4945.11	3.23
158	14655	88.47	167.78	9572.99	-5008.01	622.34	5039.07	1.92
159	14749	87.95	168.29	9575.93	-5099.92	641.82	5132.97	0.77
160	14842	89.13	166.68	9578.30	-5190.67	661.97	5225.86	2.15
161	14936	89.52	164.65	9579.41	-5281.74	685.24	5319.61	2.20
162	15029	91.26	164.96	9578.77	-5371.48	709.61	5412.25	1.90
163	15123	90.72	164.17	9577.15	-5462.08	734.62	5505.84	1.02
164	15217	90.03	165.21	9576.53	-5552.74	759.44	5599.46	1.33
165	15310	90.42	166.77	9576.17	-5642.97	781.96	5692.25	1.73
166	15404	92.02	169.39	9574.17	-5734.91	801.37	5786.18	3.27
167	15497	90.70	167.31	9571.96	-5825.96	820.14	5879.12	2.65
168	15592	88.59	166.31	9572.55	-5918.44	841.81	5973.98	2.46
169	15685	90.33	167.96	9573.42	-6009.10	862.52	6066.87	2.58
170	15779	90.85	168.61	9572.46	-6101.13	881.60	6160.83	0.89
171	15873	89.80	168.70	9571.92	-6193.30	900.09	6254.81	1.12
172	15967	89.88	166.72	9572.18	-6285.14	920.10	6348.74	2.11
173	16055	90.46	166.77	9572.39	-6370.88	939.81	6436.62	0.66
174	16149	91.20	167.21	9571.03	-6462.46	960.97	6530.50	0.92
175	16243	90.97	166.05	9569.25	-6553.89	982.70	6624.33	1.26
176	16337	92.06	166.50	9566.76	-6645.17	1005.00	6718.12	1.25
177	16430	90.12	164.77	9564.99	-6735.24	1028.06	6810.85	2.79
178	16524	90.05	162.40	9564.85	-6825.40	1054.63	6904.29	2.52
179	16618	90.23	163.51	9564.62	-6915.27	1082.18	6997.62	1.20
180	16712	91.25	165.19	9563.41	-7005.78	1107.53	7091.18	2.09
181	16805	90.09	165.05	9562.32	-7095.65	1131.41	7183.86	1.26
182	16899	90.30	165.38	9562.00	-7186.54	1155.40	7277.56	0.42
183	16993	91.99	167.61	9560.12	-7277.91	1177.35	7371.38	2.98
184	17087	91.11	168.89	9557.58	-7369.90	1196.48	7465.31	1.65
185	17180	89.97	170.32	9556.24	-7461.28	1213.73	7558.29	1.97
186	17274	88.22	168.21	9557.72	-7553.61	1231.23	7652.27	2.92
187	17368	87.97	167.97	9560.85	-7645.54	1250.62	7746.17	0.37
188	17461	88.57	168.65	9563.66	-7736.57	1269.46	7839.10	0.97
189	17555	90.54	170.37	9564.39	-7828.99	1286.57	7933.09	2.78
190	17648	89.97	167.29	9563.97	-7920.21	1304.58	8026.06	3.37
191	17742	89.96	166.76	9564.03	-8011.81	1325.69	8119.95	0.56
192	17835	90.33	167.13	9563.79	-8102.41	1346.69	8212.83	0.56
193	17929	92.24	165.27	9561.69	-8193.66	1369.11	8306.62	2.84
194	18022	92.87	164.79	9557.54	-8283.42	1393.11	8399.20	0.85
195	18116	93.19	164.28	9552.57	-8373.89	1418.14	8492.67	0.64
196	18210	93.58	164.82	9543.64	-8462.55	1450.51	8585.67	0.71
197	18303	95.74	165.87	9536.09	-8552.22	1473.96	8678.07	2.58
198	18397	96.43	165.63	9526.12	-8642.81	1496.97	8771.31	0.78
199	18491	92.07	163.70	9519.16	-8733.19	1521.76	8864.65	5.07
200	18584	93.26	164.84	9518.21	-8824.39	1539.57	8957.56	1.77
201	18678	93.05	164.98	9513.04	-8915.01	1564.00	9051.07	0.27
202	18771	92.54	166.08	9508.50	-9004.95	1587.21	9143.70	1.30
203	18865	94.63	167.28	9502.63	-9096.24	1608.82	9237.37	2.56
204	18959	97.01	168.15	9493.09	-9187.60	1628.72	9330.82	2.69
205	19052	97.75	168.25	9481.15	-9277.88	1647.58	9423.01	0.80
206	19145	95.93	168.75	9470.07	-9368.36	1665.99	9515.32	2.03

207	19239	92.39	168.68	9463.26	-9460.29	1684.33	9609.04	3.77
208	19333	92.25	168.56	9459.45	-9552.36	1702.87	9702.95	0.20
209	19426	92.59	169.06	9455.52	-9643.52	1720.90	9795.85	0.65
210	19520	91.89	168.65	9451.85	-9735.67	1739.05	9889.76	0.86
211	19614	91.82	168.55	9448.81	-9827.77	1757.62	9983.69	0.13
212	19639	91.77	168.36	9448.02	-9852.25	1762.62	10008.68	0.79
PTB	19705	91.77	168.36	9445.99	-9916.86	1775.93	10074.62	0.00