



MWD SURVEY REPORT

MWD Services, LLC

HOBBSOCD
APR 17 2015
RECEIVED

Report Date : February 11, 2015
Job Number : 15015
Operator : EOG Resources, Inc.
Lease / Well : Opal 36 State #301H
Location : Lea County, NM
Field / Formation : Red Hills
Contractor / Rig : H&P 328
Directional Company : EOG Resources, Inc.
MWD Field Rep. : Chris Parsley, Chris Adams
Tie In Survey Reference : Assume Vertical At Surface
Calculation Method : MINIMUM CURVATURE

Target +N / -S = 4830.0'
Target +E / -W = -38.0'
Target TVD = 10456.0'
Magnetic Declination +E / -W = 7.14°
Grid Convergence +E / -W = 0.49°
Total Correction +E / -W = 6.65°
North Reference = Grid
RKB Height = 24.00'
Ground Level Elevation = 3375'
Vertical Section Azimuth = 359.55°

Comments :

SURVEY #0 = TIE IN SURVEY
SURVEY #110 = STRAIGHT LINE PROJECTED SURVEY TO BIT DEPTH

30-025-42340

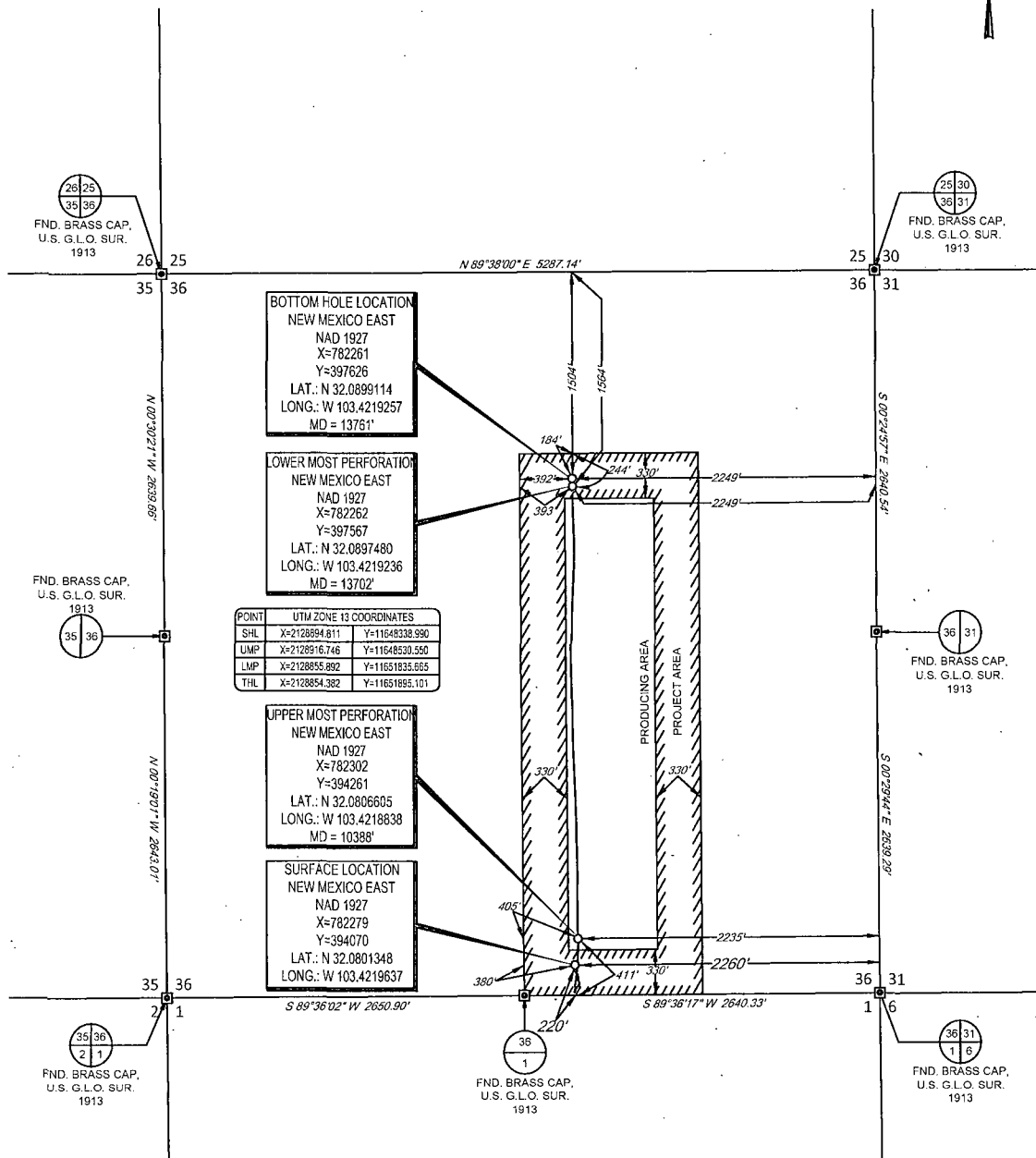
Srv. No.	Survey Depth (ft)	Inclination (deg)	Azimuth (deg)	Course Length (ft)	True Vertical Depth (ft)	Vertical Section (ft)	Coordinates		Closure		Dogleg Severity (deg/100')
							+N / -S (ft)	+E / -W (ft)	Distance (ft)	Azimuth (deg)	
0	0.00'	0.00°	0.00°		0.00'	0.00'	0.00'	0.00'			
1	172.00'	0.30°	292.50°	172'	172.00'	0.18'	0.17'	-0.42'	0.45'	292.50°	0.17°
2	357.00'	0.00°	127.20°	185'	357.00'	0.36'	0.36'	-0.86'	0.93'	292.50°	0.16°
3	511.00'	0.30°	1.80°	154'	511.00'	0.77'	0.76'	-0.85'	1.14'	311.80°	0.19°
4	694.00'	0.90°	340.00°	183'	693.99'	2.60'	2.59'	-1.33'	2.91'	332.87°	0.35°
5	875.00'	0.80°	2.60°	181'	874.97'	5.20'	5.19'	-1.76'	5.48'	341.30°	0.19°
6	949.00'	1.00°	349.00°	74'	948.96'	6.35'	6.34'	-1.86'	6.60'	343.68°	0.39°
7	1064.00'	0.90°	353.00°	115'	1063.94'	8.24'	8.22'	-2.16'	8.50'	345.29°	0.10°
8	1245.00'	2.40°	197.70°	181'	1244.90'	6.05'	6.02'	-3.48'	6.95'	329.94°	1.79°
9	1431.00'	1.80°	196.00°	186'	1430.77'	-0.46'	-0.50'	-5.47'	5.50'	264.79°	0.32°
10	1620.00'	1.60°	192.70°	189'	1619.69'	-5.87'	-5.93'	-6.87'	9.07'	229.22°	0.12°
11	1810.00'	1.40°	193.90°	190'	1809.63'	-10.70'	-10.77'	-8.01'	13.42'	216.65°	0.11°
12	1999.00'	1.10°	186.60°	189'	1998.58'	-14.74'	-14.81'	-8.77'	17.21'	210.65°	0.18°
13	2189.00'	1.70°	183.30°	190'	2188.52'	-19.36'	-19.44'	-9.15'	21.48'	205.20°	0.32°
14	2378.00'	1.70°	173.40°	189'	2377.44'	-24.95'	-25.02'	-8.99'	26.58'	199.76°	0.16°
15	2568.00'	1.60°	165.20°	190'	2567.36'	-30.32'	-30.38'	-7.98'	31.41'	194.72°	0.13°
16	2757.00'	1.70°	147.80°	189'	2756.28'	-35.26'	-35.31'	-5.82'	35.78'	189.35°	0.27°
17	2947.00'	1.60°	133.50°	190'	2946.21'	-39.50'	-39.52'	-2.39'	39.59'	183.46°	0.22°
18	3136.00'	2.60°	158.50°	189'	3135.08'	-45.33'	-45.32'	1.09'	45.34'	178.62°	0.71°
19	3326.00'	2.20°	143.00°	190'	3324.92'	-52.28'	-52.24'	4.87'	52.47'	174.68°	0.40°
20	3515.00'	2.40°	118.90°	189'	3513.77'	-57.14'	-57.05'	10.52'	58.02'	169.56°	0.52°
21	3705.00'	2.30°	142.90°	190'	3703.61'	-62.14'	-62.02'	16.30'	64.12'	165.27°	0.52°
22	3895.00'	2.20°	178.70°	190'	3893.48'	-68.85'	-68.71'	18.68'	71.20'	164.79°	0.73°
23	4084.00'	2.20°	157.10°	189'	4082.34'	-75.83'	-75.67'	20.18'	78.32'	165.07°	0.44°
24	4274.00'	2.10°	174.80°	190'	4272.21'	-82.67'	-82.50'	21.91'	85.36'	165.13°	0.35°
25	4463.00'	1.80°	180.90°	189'	4461.10'	-89.09'	-88.92'	22.18'	91.64'	165.99°	0.19°
26	4652.00'	1.90°	167.50°	189'	4650.00'	-95.12'	-94.94'	22.81'	97.64'	166.49°	0.23°
27	4842.00'	2.60°	194.40°	190'	4839.86'	-102.37'	-102.19'	22.42'	104.62'	167.63°	0.66°
28	5032.00'	3.10°	159.60°	190'	5029.64'	-111.36'	-111.18'	23.14'	113.57'	168.24°	0.93°
29	5221.00'	2.50°	154.70°	189'	5218.41'	-119.91'	-119.70'	26.68'	122.64'	167.43°	0.34°
30	5399.00'	2.00°	139.70°	178'	5396.27'	-125.81'	-125.58'	30.35'	129.19'	166.41°	0.43°
31	5589.00'	2.10°	183.80°	190'	5586.16'	-131.83'	-131.58'	32.26'	135.48'	166.22°	0.81°
32	5778.00'	2.10°	185.20°	189'	5775.04'	-138.73'	-138.48'	31.72'	142.07'	167.10°	0.03°
33	5968.00'	2.30°	224.60°	190'	5964.91'	-144.89'	-144.67'	28.73'	147.49'	168.77°	0.79°
34	6157.00'	2.50°	217.80°	189'	6153.74'	-150.80'	-150.62'	23.54'	152.45'	171.12°	0.18°
35	6347.00'	2.60°	217.70°	190'	6343.55'	-157.45'	-157.31'	18.36'	158.38'	173.34°	0.05°

Srv. No.	Survey Depth (ft)	Inclination (deg)	Azimuth (deg)	Course Length (ft)	True Vertical Depth (ft)	Vertical Section (ft)	Coordinates		Closure		Dogleg Severity (deg/100')
							+N / -S (ft)	+E / -W (ft)	Distance (ft)	Azimuth (deg)	
36	6536.00'	2.40°	212.90°	189'	6532.37'	-164.12'	-164.02'	13.59'	164.58'	175.26°	0.15°
37	6726.00'	2.50°	219.30°	190'	6722.20'	-170.63'	-170.57'	8.81'	170.80'	177.04°	0.15°
38	6915.00'	2.60°	212.40°	189'	6911.01'	-177.40'	-177.38'	3.90'	177.42'	178.74°	0.17°
39	7105.00'	2.50°	209.90°	190'	7100.83'	-184.60'	-184.61'	-0.48'	184.61'	180.15°	0.08°
40	7294.00'	2.50°	214.50°	189'	7289.65'	-191.54'	-191.58'	-4.87'	191.64'	181.45°	0.11°
41	7484.00'	0.50°	175.60°	190'	7479.57'	-195.76'	-195.82'	-7.15'	195.95'	182.09°	1.12°
42	7673.00'	0.80°	198.20°	189'	7668.56'	-197.83'	-197.90'	-7.50'	198.04'	182.17°	0.21°
43	7863.00'	0.80°	130.90°	190'	7858.55'	-199.97'	-200.03'	-6.91'	200.15'	181.98°	0.47°
44	8052.00'	0.50°	108.90°	189'	8047.54'	-201.11'	-201.16'	-5.13'	201.22'	181.46°	0.20°
45	8241.00'	0.80°	65.70°	189'	8236.52'	-200.85'	-200.88'	-3.15'	200.91'	180.90°	0.29°
46	8431.00'	0.80°	59.20°	190'	8426.51'	-199.64'	-199.66'	-0.80'	199.66'	180.23°	0.05°
47	8621.00'	0.80°	48.60°	190'	8616.49'	-198.10'	-198.10'	1.33'	198.10'	179.61°	0.08°
48	8810.00'	0.60°	47.50°	189'	8805.47'	-196.58'	-196.56'	3.05'	196.58'	179.11°	0.11°
49	9000.00'	0.60°	10.90°	190'	8995.46'	-194.93'	-194.91'	3.97'	194.95'	178.83°	0.20°
50	9189.00'	0.20°	45.30°	189'	9184.46'	-193.73'	-193.71'	4.40'	193.76'	178.70°	0.24°
51	9378.00'	0.20°	345.20°	189'	9373.46'	-193.18'	-193.16'	4.55'	193.21'	178.65°	0.11°
52	9574.00'	1.00°	329.60°	196'	9569.45'	-191.37'	-191.35'	3.59'	191.38'	178.92°	0.41°
53	9669.00'	3.10°	346.10°	95'	9664.38'	-188.15'	-188.14'	2.56'	188.16'	179.22°	2.27°
54	9716.00'	8.10°	355.30°	47'	9711.14'	-183.61'	-183.60'	1.98'	183.61'	179.38°	10.77°
55	9764.00'	12.60°	357.90°	48'	9758.35'	-175.00'	-175.00'	1.51'	175.00'	179.51°	9.42°
56	9811.00'	17.30°	359.80°	47'	9803.75'	-162.88'	-162.88'	1.30'	162.88'	179.54°	10.05°
57	9859.00'	20.80°	1.50°	48'	9849.11'	-147.22'	-147.22'	1.50'	147.22'	179.42°	7.38°
58	9906.00'	23.50°	6.20°	47'	9892.64'	-129.57'	-129.55'	2.73'	129.58'	178.79°	6.87°
59	9954.00'	26.20°	8.30°	48'	9936.19'	-109.59'	-109.55'	5.29'	109.68'	177.24°	5.92°
60	10001.00'	30.20°	8.10°	47'	9977.61'	-87.64'	-87.57'	8.45'	87.98'	174.49°	8.51°
61	10048.00'	33.90°	5.60°	47'	10017.44'	-62.90'	-62.82'	11.40'	63.84'	169.71°	8.36°
62	10095.00'	39.40°	4.30°	47'	10055.13'	-34.98'	-34.87'	13.80'	37.51'	158.41°	11.82°
63	10143.00'	42.90°	5.60°	48'	10091.27'	-3.54'	-3.41'	16.54'	16.89'	101.67°	7.51°
64	10188.00'	44.80°	3.00°	45'	10123.72'	27.52'	27.67'	18.86'	33.48'	34.28°	5.82°
65	10238.00'	47.80°	3.40°	50'	10158.26'	63.59'	63.75'	20.88'	67.09'	18.14°	6.03°
66	10285.00'	54.60°	2.60°	47'	10187.70'	100.13'	100.31'	22.79'	102.87'	12.80°	14.53°
67	10333.00'	61.40°	0.60°	48'	10213.12'	140.78'	140.98'	23.90'	142.99'	9.62°	14.60°
68	10380.00'	69.30°	358.10°	47'	10232.71'	183.46'	183.65'	23.38'	185.13'	7.26°	17.49°
69	10391.00'	70.70°	358.20°	11'	10236.47'	193.79'	193.98'	23.05'	195.35'	6.78°	12.76°
70	10431.00'	75.90°	358.30°	40'	10247.96'	232.08'	232.26'	21.88'	233.29'	5.38°	13.00°
71	10463.00'	77.20°	358.60°	32'	10255.40'	263.20'	263.37'	21.04'	264.21'	4.57°	4.16°
72	10557.00'	80.90°	359.00°	94'	10273.26'	355.47'	355.63'	19.11'	356.14'	3.08°	3.96°
73	10589.00'	83.50°	359.40°	32'	10277.60'	387.17'	387.32'	18.66'	387.77'	2.76°	8.22°
74	10620.00'	85.10°	359.70°	31'	10280.68'	418.01'	418.17'	18.42'	418.57'	2.52°	5.25°
75	10652.00'	85.20°	359.70°	32'	10283.38'	449.90'	450.05'	18.26'	450.42'	2.32°	0.31°
76	10684.00'	85.40°	360.00°	32'	10286.01'	481.79'	481.95'	18.17'	482.29'	2.16°	1.12°
77	10715.00'	85.90°	360.00°	31'	10288.36'	512.70'	512.86'	18.17'	513.18'	2.03°	1.61°
78	10747.00'	87.00°	0.10°	32'	10290.34'	544.64'	544.79'	18.20'	545.10'	1.91°	3.45°
79	10842.00'	88.50°	0.30°	95'	10294.07'	639.55'	639.72'	18.53'	639.99'	1.66°	1.59°

Srv. No.	Survey Depth (ft)	Inclination (deg)	Azimuth (deg)	Course Length (ft)	True Vertical Depth (ft)	Vertical Section (ft)	Coordinates		Closure		Dogleg Severity (deg/100 ')
							+N / -S (ft)	+E / -W (ft)	Distance (ft)	Azimuth (deg)	
80	10936.00'	88.00°	358.90°	94'	10296.94'	733.51'	733.67'	17.88'	733.89'	1.40°	1.58°
81	11031.00'	87.50°	359.10°	95'	10300.67'	828.43'	828.58'	16.22'	828.74'	1.12°	0.57°
82	11126.00'	89.80°	358.60°	95'	10302.91'	923.39'	923.53'	14.31'	923.64'	0.89°	2.48°
83	11221.00'	91.00°	358.60°	95'	10302.24'	1018.37'	1018.50'	11.99'	1018.57'	0.67°	1.26°
84	11316.00'	92.60°	358.60°	95'	10299.26'	1113.31'	1113.42'	9.67'	1113.46'	0.50°	1.68°
85	11411.00'	91.60°	358.00°	95'	10295.78'	1208.22'	1208.31'	6.86'	1208.33'	0.33°	1.23°
86	11505.00'	91.10°	356.70°	94'	10293.56'	1302.12'	1302.18'	2.51'	1302.18'	0.11°	1.48°
87	11600.00'	90.40°	357.10°	95'	10292.32'	1397.01'	1397.03'	-2.63'	1397.04'	359.89°	0.85°
88	11695.00'	86.70°	357.10°	95'	10294.72'	1491.88'	1491.87'	-7.43'	1491.88'	359.71°	3.89°
89	11790.00'	88.00°	358.50°	95'	10299.12'	1586.73'	1586.69'	-11.07'	1586.73'	359.60°	2.01°
90	11884.00'	91.00°	358.70°	94'	10299.94'	1680.70'	1680.65'	-13.37'	1680.70'	359.54°	3.20°
91	11979.00'	95.30°	359.40°	95'	10294.72'	1775.53'	1775.47'	-14.94'	1775.53'	359.52°	4.59°
92	12074.00'	91.70°	359.00°	95'	10288.92'	1870.34'	1870.27'	-16.27'	1870.34'	359.50°	3.81°
93	12169.00'	88.60°	357.70°	95'	10288.67'	1965.30'	1965.21'	-19.00'	1965.30'	359.45°	3.54°
94	12264.00'	90.00°	358.20°	95'	10289.83'	2060.25'	2060.14'	-22.40'	2060.26'	359.38°	1.56°
95	12358.00'	89.80°	358.70°	94'	10289.99'	2154.24'	2154.11'	-24.94'	2154.25'	359.34°	0.57°
96	12453.00'	90.40°	359.40°	95'	10289.83'	2249.23'	2249.09'	-26.52'	2249.25'	359.32°	0.97°
97	12548.00'	91.60°	1.30°	95'	10288.17'	2344.20'	2344.07'	-25.94'	2344.21'	359.37°	2.37°
98	12643.00'	92.60°	2.30°	95'	10284.69'	2439.06'	2438.96'	-22.96'	2439.07'	359.46°	1.49°
99	12738.00'	89.90°	0.60°	95'	10282.62'	2533.98'	2533.89'	-20.55'	2533.98'	359.54°	3.36°
100	12832.00'	91.40°	1.70°	94'	10281.55'	2627.93'	2627.86'	-18.67'	2627.93'	359.59°	1.98°
101	12927.00'	90.90°	2.30°	95'	10279.64'	2722.82'	2722.79'	-15.35'	2722.83'	359.68°	0.82°
102	13022.00'	93.80°	2.70°	95'	10275.75'	2817.61'	2817.61'	-11.21'	2817.63'	359.77°	3.08°
103	13117.00'	94.10°	2.30°	95'	10269.21'	2912.25'	2912.29'	-7.08'	2912.30'	359.86°	0.53°
104	13212.00'	91.90°	0.20°	95'	10264.23'	3007.07'	3007.12'	-5.01'	3007.13'	359.90°	3.20°
105	13307.00'	90.90°	358.50°	95'	10261.91'	3102.04'	3102.09'	-6.09'	3102.09'	359.89°	2.08°
106	13402.00'	91.80°	357.50°	95'	10259.67'	3196.97'	3197.00'	-9.40'	3197.01'	359.83°	1.42°
107	13496.00'	87.70°	358.40°	94'	10260.08'	3290.92'	3290.92'	-12.76'	3290.94'	359.78°	4.47°
108	13591.00'	87.10°	358.90°	95'	10264.39'	3385.81'	3385.79'	-15.00'	3385.83'	359.75°	0.82°
109	13686.00'	88.30°	358.90°	95'	10268.21'	3480.72'	3480.70'	-16.82'	3480.74'	359.72°	1.26°
110	13762.00'	88.30°	358.90°	76'	10270.46'	3556.68'	3556.65'	-18.28'	3556.70'	359.71°	0.00°

SCALE: 1" = 1000'
0' 500' 1000'

SECTION 36, TOWNSHIP 26-S, RANGE 34-E, N.M.P.M.
LEA COUNTY, NEW MEXICO

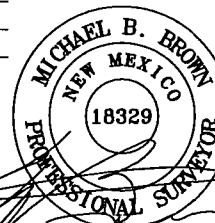


LEASE NAME & WELL NO.: OPAL 36 STATE #301H
SECTION 36 TWP 25-S RGE 34-E SURVEY N.M.P.M.
COUNTY LEA STATE NM ELEVATION 3297'
DESCRIPTION 220' FSL & 2260' FEL



TOPOGRAPHIC
LOYALTY INNOVATION LEGACY

1400 EVERMAN PARKWAY, Ste. 197 • FT. WORTH, TEXAS 76140
TELEPHONE: (817) 744-7512 • FAX: (817) 744-7549
2903 NORTH BIG SPRING • MIDLAND, TEXAS 79705
TELEPHONE: (432) 682-1653 OR (800) 767-1653 • FAX: (432) 682-1743
WWW.TOPOGRAPHIC.COM



Michael Blake Brown, P.S. No. 18329
MARCH 31, 2015

eoog resources, Inc.

OPAL 36 STATE #301H AS-COMPLETED	REVISION:	
	INT	DATE
DATE: 03/31/15		
FILE: AD_OPAL36STATE_301H		
DRAWN BY: E.A.H.		
SHEET: 1 OF 1		

NOTES:

1. ORIGINAL DOCUMENT SIZE: 8.5" X 11"
2. ALL BEARINGS, DISTANCES, AND COORDINATE VALUES CONTAINED HEREIN ARE GRID BASED UPON THE NEW MEXICO STATE PLANE COORDINATE SYSTEM, EAST ZONE, U.S. SURVEY FEET, NORTH AMERICAN DATUM 1927.
3. CERTIFICATION IS MADE ONLY TO THE LOCATION OF THIS EASEMENT, IN RELATION TO THE EVIDENCE FOUND DURING A FIELD SURVEY, MADE ON THE GROUND, UNDER MY SUPERVISION, AND USING DOCUMENTATION PROVIDED BY EOG RESOURCES, INC. ONLY UTILITIES/EASEMENTS THAT WERE VISIBLE ON THE DATE OF THIS SURVEY, WITHIN ADJOINING THIS EASEMENT, HAVE BEEN LOCATED AS SHOWN HEREON OF WHICH I HAVE KNOWLEDGE. THIS CERTIFICATION IS LIMITED TO THOSE PERSONS OR ENTITIES SHOWN ON THE FACE OF THIS PLAT AND IS NON-TRANSFERABLE, AND MADE FOR THIS TRANSACTION ONLY.