

Survey Type		Meas. Depth	Inc.	Azimuth	TVD	Coordinates		Closure	Vertical Section	Dog Leg Severity
						N-S	E-W			
<b>Well Bore: Original Well Bore</b>					<b>Plane of Vertical Section: 0</b>					
** Tieln	0.0	0.00	0	0.0	0.0	0.0	0.0	0.0	0.0	
ASO	160.0	1.00								
ASO	442.0	3.00								
TRUET	556.0	2.57	175.41	555.8	-12.4	1.0	12.5	-12.4	0.462	
TRUET	587.0	2.41	166.37	586.8	-13.8	1.2	13.8	-13.8	1.366	
TRUET	618.0	2.25	177.05	617.8	-15.0	1.4	15.1	-15.0	1.490	
TRUET	649.0	2.48	160.35	648.7	-16.2	1.6	16.3	-16.2	2.334	
TRUET	679.0	2.54	167.13	678.7	-17.5	2.0	17.6	-17.5	1.009	
TRUET	710.0	2.55	164.18	709.7	-18.8	2.4	19.0	-18.8	0.424	
TRUET	740.0	2.51	167.16	739.6	-20.1	2.7	20.3	-20.1	0.458	
TRUET	770.0	2.64	162.86	769.6	-21.4	3.0	21.6	-21.4	0.776	
TRUET	801.0	2.68	158.23	800.6	-22.8	3.5	23.0	-22.8	0.705	
TRUET	832.0	2.95	154.55	831.5	-24.2	4.1	24.5	-24.2	1.048	
MWD	863.0	3.32	140.26	862.5	-25.6	5.0	26.1	-25.6	2.779	
MWD	893.0	3.69	133.95	892.4	-26.9	6.3	27.6	-26.9	1.780	
MWD	924.0	4.10	124	923.4	-28.2	7.9	29.3	-28.2	2.545	
MWD	954.0	4.90	113.16	953.3	-29.3	10.0	31.0	-29.3	3.881	
MWD	985.0	6.40	101.9	984.1	-30.2	12.9	32.8	-30.2	5.995	
MWD	1,015.0	7.06	99.42	1,013.9	-30.8	16.4	34.9	-30.8	2.403	
MWD	1,046.0	7.70	93.9	1,044.7	-31.3	20.3	37.3	-31.3	3.079	
MWD	1,077.0	8.75	92.56	1,075.3	-31.5	24.7	40.1	-31.5	3.443	
MWD	1,108.0	10.05	93.39	1,105.9	-31.8	29.8	43.6	-31.8	4.216	
MWD	1,170.0	12.85	92.9	1,166.7	-32.5	42.1	53.2	-32.5	4.519	
MWD	1,201.0	13.66	94.61	1,196.9	-32.9	49.2	59.2	-32.9	2.903	
MWD	1,232.0	14.72	95.86	1,226.9	-33.6	56.7	66.0	-33.6	3.559	
MWD	1,262.0	15.92	94.53	1,255.8	-34.4	64.6	73.2	-34.4	4.168	
MWD	1,292.0	16.80	94.47	1,284.6	-35.0	73.1	81.0	-35.0	2.934	
MWD	1,323.0	16.70	95.24	1,314.3	-35.8	82.0	89.4	-35.8	0.785	
MWD	1,353.0	16.60	99.63	1,343.1	-36.9	90.5	97.7	-36.9	4.205	
MWD	1,385.0	16.17	103.89	1,373.8	-38.7	99.3	106.6	-38.7	3.987	
MWD	1,416.0	16.13	106.86	1,403.5	-41.0	107.6	115.2	-41.0	2.668	
MWD	1,447.0	16.47	106.98	1,433.3	-43.5	115.9	123.9	-43.5	1.102	
MWD	1,477.0	16.96	105.13	1,462.0	-45.9	124.2	132.5	-45.9	2.411	
MWD	1,507.0	18.13	103.2	1,490.6	-48.1	133.0	141.4	-48.1	4.355	
MWD	1,538.0	18.44	104.3	1,520.1	-50.4	142.5	151.1	-50.4	1.496	
MWD	1,570.0	18.87	103.17	1,550.4	-52.9	152.4	161.3	-52.9	1.755	
MWD	1,600.0	18.95	102.46	1,578.8	-55.0	161.9	171.0	-55.0	0.812	
MWD	1,630.0	19.05	101.6	1,607.1	-57.1	171.4	180.7	-57.1	0.991	
MWD	1,661.0	19.02	102.4	1,636.4	-59.2	181.3	190.7	-59.2	0.847	
MWD	1,750.0	19.46	100.67	1,720.5	-65.0	210.0	219.9	-65.0	0.809	
DIGITA	1,890.0	19.60	110	1,852.4	-77.4	255.0	266.5	-77.4	2.228	
DIGITA	2,146.0	18.50	112.9	2,094.4	-107.9	332.8	349.9	-107.9	0.567	
DIGITA	2,421.0	17.20	111	2,356.2	-139.4	411.0	434.0	-139.4	0.518	
DIGITA	2,567.0	15.70	112	2,496.2	-154.6	449.4	475.3	-154.6	1.046	



# Directional Survey Report

Calpine

Well ID: Happy Jack 12

Well Name: Happy Jack 12

Field: Geysers

Sect: 28 Town: 11N Rng: 9W County: Sonoma State: CA

Survey Type	Meas. Depth	Inc.	Azimuth	TVD	Coordinates		Closure	Vertical Section	Dog Leg Severity
					N-S	E-W			
MSS	2,724.0	18.00	115	2,646.5	-172.8	491.1	520.6	-172.8	1.566
MSS	2,817.0	19.50	104	2,734.5	-182.6	519.2	550.4	-182.6	4.122
MSS	3,039.0	20.50	105	2,943.2	-201.6	592.7	626.1	-201.6	0.476
MSS	3,290.0	18.50	103	3,179.7	-222.0	674.0	709.6	-222.0	0.840
MSS	3,535.0	16.00	103	3,413.7	-238.3	744.8	782.0	-238.3	1.020
MSS	3,668.0	15.75	103	3,541.6	-246.5	780.2	818.2	-246.5	0.188
MSS	3,852.0	17.25	102	3,718.1	-257.8	831.2	870.3	-257.8	0.830
MSS	4,036.0	22.25	92	3,891.2	-264.7	892.8	931.2	-264.7	3.271
MSS	4,159.0	23.25	90	4,004.7	-265.5	940.3	977.1	-265.5	1.028
MSS	4,372.0	23.00	90	4,200.5	-265.5	1,024.0	1,057.9	-265.5	0.117
MSS	4,588.0	22.25	92	4,399.9	-266.9	1,107.1	1,138.8	-266.9	0.497
DIGITA	4,680.0	21.30	90.8	4,485.4	-267.8	1,141.2	1,172.2	-267.8	1.140
DIGITA	4,862.0	20.60	83.8	4,655.4	-264.8	1,206.1	1,234.8	-264.8	1.427
DIGITA	5,077.0	18.90	83.5	4,857.7	-256.7	1,278.3	1,303.8	-256.7	0.792
DIGITA	5,221.0	18.00	84.2	4,994.3	-251.8	1,323.6	1,347.3	-251.8	0.644
DIGITA	5,409.0	18.10	82.4	5,173.0	-245.0	1,381.4	1,403.0	-245.0	0.301
DIGITA	5,563.0	19.90	80.5	5,318.6	-237.6	1,431.0	1,450.6	-237.6	1.236
DIGITA	5,693.0	21.50	87.3	5,440.3	-232.8	1,476.6	1,494.9	-232.8	2.219
ASO	5,827.0	22.00							
DIGITA	5,972.0	21.20	81.6	5,700.2	-223.0	1,577.6	1,593.3	-223.0	0.751
DIGITA	6,134.0	20.30	77.5	5,851.7	-212.6	1,634.0	1,647.8	-212.6	1.055
DIGITA	6,278.0	19.40	75.3	5,987.1	-201.2	1,681.6	1,693.5	-201.2	0.812
DIGITA	6,584.0	19.90	75.8	6,275.3	-175.5	1,781.2	1,789.8	-175.5	0.172
DIGITA	6,769.0	21.90	69.6	6,448.1	-155.7	1,844.1	1,850.6	-155.7	1.611
DIGITA	6,965.0	22.50	72.7	6,629.6	-131.8	1,914.1	1,918.7	-131.8	0.671
DIGITA	7,075.0	18.90	74.6	6,732.5	-120.8	1,951.4	1,955.2	-120.8	3.329
DIGITA	7,230.0	20.00	56.6	6,878.8	-99.6	1,997.8	2,000.3	-99.6	3.916
DIGITA	7,386.0	19.10	61.7	7,025.8	-72.8	2,042.6	2,043.8	-72.8	1.236
DIGITA	7,541.0	20.60	74.5	7,171.6	-53.5	2,091.2	2,091.9	-53.5	2.960
DIGITA	7,622.0	20.60	74.5	7,247.5	-45.8	2,118.6	2,119.1	-45.8	0.000

Calculations using Minimum Curvature Method