**WELL ANALYSIS CORPORATION**

AUDIO DETECTION SURVEY

FILING NO.

| | |
|---|---|
| COMPANY: | SOUTHERN CALIF. GAS CO. |
| WELL: | FERNANDO FEE 32D |
| FIELD: | ALISO CANYON |
| COUNTY: | LOS ANGELES |
| STATE: | CALIFORNIA |
| LOCATION: | DISTRICT 2 |
| OTHER SVC: | |

API NUMBER: 0403721356
SEC: 27 TWN: 3N RNG: 16W

QC

PERMANENT DATUM: GROUND LEVEL ELEV: 1995Ft.
LOG MEASURED FROM KB 15' ABOVE PERM DATUM
DRILLING MEASURED FROM

-ELEVATIONS-
KB: 2010 Ft.
DF: Ft.
GL: 1995 Ft.

| | | | | | |
|---|---|---|---|---|---|
| DATE LOG RAN | 10-23-2013 | PRESSURE | FLOWING | INJECTION | SHUT-IN |
| RUN NUMBER | ONE | TUBING PSI | | | 2720 |
| EFFECTIVE DEPTH | 7320' | CASING PSI | | | 2720 |
| PICKUP DEPTH | 7200' | INJECTION RATE | | N/A | |
| BOT LOGGED INT | 7200' | OBSERVED RATE | | N/A | |
| TOP LOGGED INT | 50' | R/A SOURCE | | N/A | |
| TYPE OF INJECT | NONE | ACTIVITY | | N/A | |
| FLUID IN WELL | GAS | HALF LIFE | | N/A | |
| FLUID LEVEL | N/A | | | | |
| WELL STATUS | STATIC | PRODUCTION DATA | | | |
| MAX TEMPERATURE | 131.0 F. | OIL Gr. | | OIL = | |
| AT DEPTH | 6501.0' | GAS Gr. | | GAS= | |
| TEMPERATURE SENS | 1 F/DIV. | MPP | | BHP = | |
| LOGGING SPEED | 100 FPM | | | WATER= | |
| RECORDED BY | S. MACIAS | | | | |
| WITNESSED BY | N/A | | | | |
| ENGINEER | A. KARGAR | | | | |
| DEPTH CORRELATION | LINER TOP | | | | |

**Equipment Data**

| | | | |
|---|---|---|---|
| COLLAR LOCATOR | 1.375" | | |
| TEMPERATURE TOOL | 1.375" | | |
| AUDIO DETECTOR | 1.375" | | |

**Remarks/Survey Results**

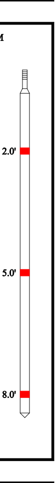
SURVEY INDICATES HIGH NOISE DUE TO INJECTION ZONE AND WATER INJECTION ZONE
POSSIBLE COMMUNICATION.
PLEASE NOTE: TOOLS GOING DOWN SLOW FROM 50'-110'.
ALSO NOTE: PACKER IS @ 7026'-7030' AFTER CORRELATION.
07:00 AM- ON LOCATION
09:00 AM- RAN IN HOLE
09:02 AM- BEGIN SURVEY
04:00 PM- OFF LOCATION

**CASING AND TUBING RECORD**

| SIZE | WT(#) | FROM | TO | SIZE | WT(#) | FROM | TO |
|---|---|---|---|---|---|---|---|
| 12" | | SURFACE | 818.0 | | | | |
| 7" | | SURFACE | 10961' | | | | |
| 4" | | 6999' | 7265' | | | | |
| 2.875" | 6.5 | SURFACE | 7045.8' | | | | |

| STR. | PIPE DIA. | PERFORATIONS |
|---|---|---|
| | | PACKERS: 7039'-7043.8'. |
| | | SLEEVES: 6972.7'-6975.9'. |
| | | NO-GO: 7007.7'. |
| | | COLLARS: 1968'. |

TOOL DIAGRAM




Audio Data: C:/DATA/\NOISE.txt

| DEPTH | 200HZ | 600HZ | 1000HZ | 2000HZ |
|---|---|---|---|---|
| 50 | 139.40 | 27.20 | 26.00 | 25.60 |
| 450 | 143.60 | 32.20 | 30.40 | 29.40 |
| 950 | 163.30 | 29.00 | 25.50 | 24.70 |
| 1450 | 167.10 | 25.80 | 19.20 | 16.60 |
| 1950 | 187.70 | 29.50 | 22.30 | 19.60 |
| 1955 | 187.70 | 29.00 | 21.30 | 18.40 |
| 1960 | 182.30 | 31.00 | 24.00 | 21.60 |
| 1965 | 183.30 | 29.90 | 23.30 | 21.00 |
| 1970 | 189.00 | 29.60 | 22.60 | 20.00 |
| 1975 | 184.90 | 32.40 | 25.50 | 23.40 |
| 2000 | 185.90 | 25.90 | 17.80 | 14.30 |
| 2450 | 212.30 | 33.90 | 24.70 | 20.00 |
| 2950 | 235.00 | 41.10 | 25.10 | 4.20 |
| 3450 | 280.90 | 56.80 | 29.70 | 9.30 |
| 3950 | 349.00 | 93.80 | 70.90 | 15.90 |
| 4450 | 429.00 | 112.70 | 83.60 | 24.90 |
| 4950 | 572.70 | 264.20 | 223.40 | 44.70 |
| 5450 | 691.70 | 381.30 | 276.50 | 102.10 |
| 5470 | 705.20 | 380.10 | 276.90 | 115.30 |
| 5490 | 754.20 | 447.10 | 347.70 | 99.90 |
| 5510 | 724.40 | 417.60 | 318.60 | 102.00 |
| 5530 | 757.00 | 467.30 | 367.30 | 105.50 |
| 5550 | 830.10 | 547.70 | 455.30 | 104.30 |
| 5560 | 813.00 | 534.00 | 438.00 | 108.80 |
| 5570 | 771.40 | 505.80 | 407.70 | 112.50 |
| 5580 | 823.60 | 525.00 | 431.10 | 121.30 |
| 5590 | 815.40 | 556.50 | 465.30 | 118.70 |
| 5600 | 812.80 | 556.40 | 472.80 | 132.30 |
| 5610 | 823.90 | 569.90 | 484.10 | 139.00 |
| 5620 | 843.10 | 581.70 | 498.50 | 136.10 |
| 5630 | 909.80 | 645.90 | 558.50 | 166.50 |
| 5640 | 921.80 | 677.80 | 591.10 | 159.00 |
| 5650 | 883.80 | 609.10 | 524.40 | 168.00 |
| 5660 | 915.80 | 662.60 | 581.80 | 181.30 |
| 5670 | 917.10 | 664.70 | 586.10 | 183.90 |
| 5680 | 991.80 | 761.70 | 676.80 | 180.60 |
| 5690 | 954.40 | 704.50 | 625.00 | 210.90 |
| 5700 | 936.00 | 680.00 | 605.50 | 221.90 |
| 5710 | 951.30 | 726.00 | 652.20 | 224.60 |
| 5720 | 970.90 | 739.90 | 667.60 | 250.10 |
| 5730 | 950.80 | 714.40 | 640.70 | 225.20 |
| 5740 | 974.30 | 743.30 | 670.90 | 218.10 |
| 5750 | 989.70 | 762.10 | 689.90 | 253.80 |
| 5760 | 963.40 | 733.50 | 663.90 | 241.00 |
| 5770 | 916.40 | 699.30 | 637.90 | 224.40 |
| 5780 | 980.00 | 759.30 | 695.90 | 251.90 |
| 5790 | 1010.00 | 773.00 | 705.10 | 237.20 |
| 5800 | 940.10 | 724.80 | 664.70 | 203.70 |
| 5810 | 982.00 | 746.20 | 682.30 | 250.40 |
| 5820 | 1023.70 | 776.00 | 717.00 | 238.00 |
| 5830 | 1034.30 | 785.00 | 721.60 | 241.40 |
| 5840 | 1015.20 | 792.30 | 732.60 | 240.70 |
| 5850 | 1024.40 | 787.90 | 726.60 | 245.00 |
| 5860 | 1014.00 | 783.80 | 724.40 | 235.10 |
| 5870 | 1016.00 | 769.70 | 713.30 | 239.20 |
| 5880 | 1046.80 | 799.30 | 743.40 | 257.30 |
| 5890 | 1012.90 | 767.80 | 713.10 | 250.40 |
| 5900 | 1042.70 | 794.90 | 738.90 | 266.20 |
| 5910 | 1083.10 | 821.10 | 764.80 | 296.90 |
| 5920 | 1052.50 | 798.90 | 746.80 | 295.50 |
| 5930 | 1021.50 | 779.50 | 729.20 | 299.10 |
| 5940 | 1071.10 | 831.10 | 779.80 | 310.10 |
| 5950 | 1056.60 | 806.80 | 758.80 | 335.20 |
| 5960 | 1057.00 | 798.00 | 753.60 | 369.00 |
| 5970 | 1080.60 | 847.90 | 803.20 | 435.50 |
| 5980 | 1106.20 | 856.00 | 812.90 | 445.00 |
| 5990 | 1117.50 | 865.50 | 823.70 | 477.60 |
| 6000 | 1138.40 | 891.30 | 850.30 | 518.40 |
| 6010 | 1131.30 | 886.80 | 848.30 | 540.80 |
| 6020 | 1123.10 | 867.20 | 828.80 | 498.60 |
| 6030 | 1151.40 | 924.80 | 886.90 | 586.50 |
| 6040 | 1152.60 | 906.30 | 870.80 | 598.10 |
| 6050 | 1160.40 | 919.70 | 883.80 | 611.20 |
| 6060 | 1199.90 | 973.30 | 942.20 | 671.30 |
| 6070 | 1168.10 | 932.10 | 900.60 | 637.20 |
| 6080 | 1167.30 | 913.30 | 881.40 | 652.90 |
| 6090 | 1192.60 | 948.90 | 920.30 | 704.00 |
| 6100 | 1215.60 | 968.70 | 939.60 | 757.80 |
| 6110 | 1240.00 | 996.40 | 967.30 | 772.50 |
| 6120 | 1185.30 | 920.10 | 889.80 | 703.50 |
| 6130 | 1232.80 | 952.40 | 921.80 | 747.90 |
| 6140 | 1218.00 | 964.40 | 937.40 | 784.10 |
| 6150 | 1191.10 | 926.20 | 899.60 | 759.10 |
| 6160 | 1183.80 | 924.10 | 897.90 | 770.50 |
| 6170 | 1202.20 | 924.30 | 897.90 | 773.30 |
| 6180 | 1155.70 | 872.90 | 845.70 | 732.80 |
| 6190 | 1092.70 | 826.60 | 794.60 | 675.90 |
| 6200 | 1078.60 | 825.20 | 795.50 | 664.60 |
| 6210 | 1049.10 | 774.00 | 743.00 | 637.90 |
| 6220 | 1037.50 | 779.50 | 743.10 | 590.80 |
| 6225 | 1024.40 | 748.70 | 712.80 | 633.50 |
| 6230 | 1002.10 | 741.10 | 712.60 | 631.90 |
| 6235 | 1051.90 | 797.90 | 764.70 | 678.00 |
| 6240 | 1069.30 | 833.00 | 774.70 | 669.40 |
| 6245 | 1042.10 | 817.80 | 775.60 | 662.70 |
| 6250 | 962.70 | 787.20 | 741.60 | 649.00 |
| 6255 | 971.10 | 799.80 | 761.60 | 672.20 |
| 6260 | 1030.00 | 857.40 | 806.30 | 715.90 |
| 6265 | 1036.30 | 896.40 | 862.50 | 724.90 |
| 6270 | 1202.00 | 1095.00 | 1019.20 | 750.10 |
| 6275 | 1156.70 | 1020.20 | 916.20 | 759.80 |
| 6280 | 1083.90 | 1003.90 | 921.20 | 807.20 |
| 6285 | 1029.10 | 972.70 | 948.30 | 866.20 |
| 6290 | 1046.00 | 1004.10 | 957.40 | 892.90 |
| 6295 | 1010.50 | 963.30 | 913.10 | 860.00 |
| 6300 | 1021.00 | 933.70 | 880.20 | 822.30 |
| 6310 | 1007.10 | 877.90 | 814.70 | 720.80 |
| 6320 | 1059.50 | 906.60 | 771.90 | 563.60 |
| 6330 | 1058.60 | 801.70 | 736.80 | 609.00 |
| 6340 | 1097.80 | 784.80 | 734.90 | 602.30 |
| 6350 | 1125.40 | 788.40 | 743.50 | 634.20 |
| 6360 | 1112.70 | 777.70 | 744.00 | 651.20 |
| 6370 | 1111.40 | 770.30 | 714.80 | 580.50 |
| 6380 | 1166.20 | 804.60 | 769.70 | 659.20 |
| 6390 | 1136.20 | 821.50 | 791.10 | 684.60 |
| 6400 | 1140.20 | 788.50 | 757.90 | 663.90 |
| 6410 | 1108.10 | 774.60 | 738.60 | 609.20 |
| 6420 | 1142.60 | 784.90 | 749.70 | 619.30 |
| 6430 | 1119.80 | 767.40 | 735.00 | 626.90 |
| 6440 | 1147.60 | 780.20 | 740.50 | 588.10 |
| 6450 | 1193.30 | 812.70 | 772.90 | 616.60 |
| 6460 | 1219.70 | 842.10 | 802.50 | 636.50 |
| 6470 | 1163.80 | 762.90 | 716.80 | 540.60 |
| 6480 | 1156.00 | 787.10 | 747.90 | 584.60 |
| 6490 | 1176.40 | 797.30 | 754.80 | 588.20 |
| 6500 | 1212.30 | 832.50 | 793.50 | 644.60 |
| 6520 | 1186.60 | 802.10 | 755.50 | 547.00 |
| 6540 | 1149.60 | 770.60 | 719.40 | 506.80 |
| 6560 | 1142.50 | 703.00 | 640.60 | 416.60 |
| 6580 | 1142.20 | 702.00 | 636.70 | 382.40 |
| 6600 | 1149.40 | 695.60 | 626.20 | 356.90 |
| 6620 | 1144.70 | 697.70 | 626.70 | 347.20 |
| 6640 | 1136.60 | 680.50 | 605.10 | 283.90 |
| 6660 | 1136.40 | 650.40 | 571.70 | 254.80 |
| 6680 | 1113.10 | 631.30 | 551.60 | 233.20 |
| 6700 | 1120.90 | 629.50 | 543.90 | 216.00 |
| 6720 | 1143.00 | 646.30 | 553.60 | 221.20 |
| 6740 | 1145.30 | 623.70 | 524.10 | 224.80 |
| 6760 | 1154.10 | 636.40 | 538.80 | 233.10 |
| 6780 | 1160.50 | 637.00 | 532.60 | 223.90 |
| 6800 | 1164.50 | 629.70 | 518.10 | 213.90 |
| 6820 | 1166.20 | 610.00 | 501.60 | 216.30 |
| 6840 | 1148.50 | 624.50 | 515.80 | 245.30 |
| 6860 | 1168.90 | 620.80 | 501.90 | 233.40 |
| 6880 | 1199.70 | 643.70 | 520.50 | 231.70 |
| 6890 | 1155.70 | 620.00 | 501.70 | 227.50 |
| 6900 | 1153.60 | 609.20 | 488.00 | 221.30 |
| 6910 | 1170.30 | 664.70 | 535.50 | 224.10 |
| 6920 | 920.20 | 505.00 | 427.20 | 169.90 |
| 6930 | 1213.40 | 606.70 | 466.70 | 184.00 |
| 6940 | 1197.30 | 588.10 | 449.70 | 218.40 |
| 6950 | 1191.90 | 604.00 | 478.60 | 222.30 |
| 6960 | 1120.20 | 538.60 | 430.00 | 186.70 |
| 6965 | 1101.80 | 511.20 | 405.50 | 181.60 |
| 6970 | 1186.40 | 538.20 | 427.80 | 185.70 |
| 6975 | 1189.80 | 540.10 | 423.60 | 180.00 |
| 6980 | 1013.80 | 444.60 | 343.40 | 163.80 |
| 6985 | 1037.20 | 474.10 | 368.00 | 177.80 |
| 6990 | 1028.20 | 457.30 | 369.80 | 166.20 |
| 6995 | 1043.20 | 412.70 | 309.10 | 148.80 |
| 7000 | 1012.10 | 418.70 | 311.80 | 144.50 |
| 7005 | 1003.70 | 401.90 | 299.80 | 143.50 |
| 7010 | 1017.30 | 406.90 | 301.60 | 135.70 |
| 7012 | 1046.70 | 419.90 | 305.00 | 130.20 |
| 7014 | 985.90 | 423.10 | 325.70 | 149.30 |
| 7016 | 1075.00 | 436.30 | 331.90 | 157.20 |
| 7018 | 1005.50 | 422.70 | 316.80 | 151.00 |
| 7020 | 1114.20 | 428.70 | 317.00 | 152.70 |
| 7021 | 1123.90 | 468.70 | 365.10 | 134.00 |
| 7022 | 1037.20 | 474.50 | 365.60 | 160.20 |
| 7023 | 866.50 | 370.00 | 286.30 | 124.00 |
| 7024 | 977.30 | 418.10 | 338.60 | 136.40 |
| 7025 | 1180.60 | 396.20 | 285.60 | 143.70 |
| 7026 | 878.70 | 528.00 | 419.20 | 132.70 |
| 7028 | 129.60 | 73.80 | 71.90 | 25.10 |
| 7030 | 136.00 | 74.50 | 72.50 | 23.60 |
| 7025 | 1206.80 | 383.00 | 261.70 | 149.20 |
| 7030 | 127.30 | 69.40 | 67.50 | 19.40 |
| 7035 | 136.90 | 70.70 | 68.50 | 21.20 |
| 7040 | 143.30 | 77.50 | 75.80 | 22.00 |
| 7045 | 120.30 | 73.60 | 71.00 | 28.10 |
| 7050 | 136.00 | 84.50 | 82.30 | 21.10 |
| 7055 | 138.50 | 85.00 | 82.90 | 18.80 |
| 7060 | 129.40 | 77.60 | 75.50 | 19.30 |
| 7065 | 137.20 | 82.60 | 80.60 | 21.20 |
| 7070 | 131.90 | 82.50 | 80.40 | 19.10 |
| 7075 | 130.90 | 80.00 | 78.00 | 20.20 |
| 7080 | 130.70 | 79.10 | 77.10 | 19.80 |
| 7085 | 130.50 | 77.60 | 75.40 | 19.30 |
| 7090 | 132.70 | 74.30 | 72.10 | 19.90 |
| 7095 | 165.50 | 101.40 | 97.70 | 22.60 |
| 7100 | 207.50 | 107.20 | 101.50 | 24.20 |
| 7105 | 211.80 | 103.30 | 97.10 | 23.80 |
| 7110 | 199.10 | 97.90 | 92.90 | 19.40 |
| 7115 | 211.60 | 110.00 | 104.40 | 18.90 |
| 7120 | 211.20 | 96.90 | 92.10 | 18.60 |
| 7130 | 136.60 | 85.20 | 80.40 | 14.90 |
| 7150 | 60.40 | 32.70 | 29.70 | 5.70 |
| 7200 | 4.00 | 3.60 | 2.60 | 2.00 |