

**Phoenix Technology Services**  
**SURVEY DATA CERTIFICATION**



PHOENIX JOB NUMBER **1010711** OPERATOR **ANDRES ALCALA**

WELL NAME **PLU BIG SINKS 22 FEDERAL 1H** COUNTY & STATE **EDDY CO., NM**

API WELL NUMBER **30-015-37838-00-X1**

PROPOSED DIRECTION **359.83**

| TIE-IN DATA       |                   |        |          |              |              |                |
|-------------------|-------------------|--------|----------|--------------|--------------|----------------|
| MEASURED<br>DEPTH | VERTICAL<br>DEPTH | INCLIN | AZIMUTH  | N-S<br>COORD | E-W<br>COORD | DATA<br>SOURCE |
| 7,700 ft          | 7,698.62 ft       | .91 ft | 115.5 ft | -18.12 ft    | 25.23 ft     | GYRO           |

| FIRST<br>SURVEY<br>DATE | FIRST<br>SURVEY<br>DEPTH | INCLIN | AZIMUTH |
|-------------------------|--------------------------|--------|---------|
| 17-Dec-10               | 7,811 ft                 | 7.0    | 359.8   |

| SURVEY INSTRUMENT<br>TYPE |
|---------------------------|
| Phoenix MWD               |

**RECEIVED**  
**JAN 11 2011**  
**NMOCD ARTESIA**

| LAST<br>SURVEY<br>DATE | LAST<br>SURVEY<br>DEPTH | INCLIN | AZIMUTH |
|------------------------|-------------------------|--------|---------|
| 25-Dec-10              | 12,754 ft               | 89.9   | 358.4   |

TO THE BEST OF MY KNOWLEDGE I  
 CERTIFY THIS SURVEY DATA TO BE  
 TRUE AND CORRECT.

| PROJECTED<br>TD SURVEY<br>DATE | PROJECTED<br>TD SURVEY<br>DEPTH | INCLIN | AZIMUTH |
|--------------------------------|---------------------------------|--------|---------|
| 25-Dec-10                      | 12,800 ft                       | 89.9   | 358.4   |

**ANDRES I. ALCALA**  
 PRINT YOUR NAME ABOVE

*Andres Alcala*  
 SIGN YOUR NAME ABOVE

**MAGNETIC DECLINATION OR TOTAL GRID**

|                       |      |
|-----------------------|------|
| TOTAL CORRECTION USED | 7.54 |
| DECLINATION OR GRID   | GRID |

**12/26/2010**  
 TODAY'S DATE

MWD SUPERVISOR 1 **ANDRES ALCALA** DIRECTIONAL DRILLER 1 **LARRY TALLEY**  
 MWD SUPERVISOR 2 **JOHN CARLISLE** DIRECTIONAL DRILLER 2 **KEN SMITH**



# PHOENIX TECHNOLOGY SERVICES

Job Number: 1010711  
Company: Chesapeake Operating  
Lease/Well: PLU Big Sinks 22 Federal 1H  
Location: Eddy County, NM  
Rig Name: Patterson 62  
RKB: 3417'  
G.L. or M.S.L.: 3400' SL: X - 687258.14 Y - 435577.99 (NAD83)

State/Country: NM  
Declination: 7.77736  
Grid: -0.24  
File name: C:\711PLU-1\PLUB.SVY  
Date/Time: 26-Dec-10 / 07:03  
Curve Name: PLU Big Sinks 22 Federal

## PLU Big Sinks 22 Federal

WINSERVE SURVEY CALCULATIONS  
Minimum Curvature Method  
Vertical Section Plane 359.83  
Vertical Section Referenced to Wellhead  
Rectangular Coordinates Referenced to Wellhead

| Measured<br>Depth<br>FT                       | Incl<br>Angle<br>Deg | Drift<br>Direction<br>Deg | True<br>Vertical<br>Depth | N-S<br>FT | E-W<br>FT | Vertical<br>Section<br>FT | CLOSURE<br>Distance<br>FT | Direction<br>Deg | Dogleg<br>Severity<br>Deg/100 |
|-----------------------------------------------|----------------------|---------------------------|---------------------------|-----------|-----------|---------------------------|---------------------------|------------------|-------------------------------|
| <b>Gyro Tie In</b>                            |                      |                           |                           |           |           |                           |                           |                  |                               |
| 7700.00                                       | .91                  | 115.50                    | 7698.62                   | -18.12    | 25.23     | -18.19                    | 31.06                     | 125.69           | .00                           |
| <b>First Phoenix MWD Surveys</b>              |                      |                           |                           |           |           |                           |                           |                  |                               |
| 7811.00                                       | 7.00                 | 359.80                    | 7809.35                   | -11.73    | 26.00     | -11.80                    | 28.53                     | 114.27           | 6.70                          |
| 7828.00                                       | 8.30                 | 7.90                      | 7826.20                   | -9.48     | 26.17     | -9.55                     | 27.83                     | 109.91           | 9.92                          |
| 7860.00                                       | 10.60                | 4.00                      | 7857.77                   | -4.25     | 26.69     | -4.33                     | 27.03                     | 99.05            | 7.46                          |
| 7892.00                                       | 14.50                | 358.40                    | 7889.00                   | 2.69      | 26.78     | 2.61                      | 26.92                     | 84.26            | 12.75                         |
| 7923.00                                       | 17.30                | 357.70                    | 7918.81                   | 11.18     | 26.49     | 11.10                     | 28.75                     | 67.12            | 9.05                          |
| 7955.00                                       | 21.90                | 358.40                    | 7948.95                   | 21.90     | 26.13     | 21.83                     | 34.10                     | 50.03            | 14.39                         |
| 7987.00                                       | 26.10                | 358.40                    | 7978.17                   | 34.91     | 25.77     | 34.84                     | 43.39                     | 36.43            | 13.12                         |
| 8019.00                                       | 29.90                | 358.40                    | 8006.42                   | 49.93     | 25.35     | 49.85                     | 55.99                     | 26.92            | 11.87                         |
| 8050.00                                       | 33.20                | 359.10                    | 8032.84                   | 66.14     | 25.00     | 66.07                     | 70.71                     | 20.71            | 10.71                         |
| 8082.00                                       | 36.60                | .20                       | 8059.08                   | 84.45     | 24.90     | 84.37                     | 88.04                     | 16.43            | 10.81                         |
| 8114.00                                       | 39.70                | 1.20                      | 8084.24                   | 104.21    | 25.14     | 104.13                    | 107.20                    | 13.57            | 9.88                          |
| 8146.00                                       | 41.90                | 357.70                    | 8108.47                   | 125.11    | 24.93     | 125.03                    | 127.57                    | 11.27            | 9.91                          |
| 8177.00                                       | 46.10                | 355.20                    | 8130.76                   | 146.59    | 23.58     | 146.52                    | 148.48                    | 9.14             | 14.66                         |
| <b>Hard Line Crossing//Interpolated Point</b> |                      |                           |                           |           |           |                           |                           |                  |                               |
| 8188.00                                       | 47.51                | 354.84                    | 8138.29                   | 154.58    | 22.88     | 154.51                    | 156.27                    | 8.42             | 13.02                         |
| 8209.00                                       | 50.20                | 354.20                    | 8152.11                   | 170.32    | 21.37     | 170.26                    | 171.66                    | 7.15             | 13.02                         |
| 8241.00                                       | 54.20                | 356.30                    | 8171.72                   | 195.51    | 19.29     | 195.45                    | 196.46                    | 5.63             | 13.53                         |
| 8272.00                                       | 58.70                | 357.00                    | 8188.85                   | 221.30    | 17.79     | 221.24                    | 222.01                    | 4.59             | 14.64                         |
| 8304.00                                       | 62.60                | 357.70                    | 8204.53                   | 249.15    | 16.50     | 249.10                    | 249.70                    | 3.79             | 12.34                         |
| 8336.00                                       | 67.30                | 358.80                    | 8218.07                   | 278.12    | 15.62     | 278.07                    | 278.56                    | 3.21             | 15.01                         |

| Measured<br>Depth<br>FT | Incl<br>Angle<br>Deg | Drift<br>Direction<br>Deg | True<br>Vertical<br>Depth | N-S<br>FT | E-W<br>FT | Vertical<br>Section<br>FT | CLOSURE        |                  | Dogleg<br>Severity<br>Deg/100 |
|-------------------------|----------------------|---------------------------|---------------------------|-----------|-----------|---------------------------|----------------|------------------|-------------------------------|
|                         |                      |                           |                           |           |           |                           | Distance<br>FT | Direction<br>Deg |                               |
| 8368.00                 | 72.00                | 358.80                    | 8229.20                   | 308.11    | 14.99     | 308.06                    | 308.47         | 2.79             | 14.69                         |
| 8399.00                 | 77.10                | 358.40                    | 8237.45                   | 337.97    | 14.26     | 337.93                    | 338.27         | 2.42             | 16.50                         |
| 8430.00                 | 82.10                | 358.40                    | 8243.05                   | 368.44    | 13.41     | 368.40                    | 368.68         | 2.08             | 16.13                         |
| 8462.00                 | 87.10                | 358.80                    | 8246.06                   | 400.28    | 12.63     | 400.24                    | 400.48         | 1.81             | 15.67                         |
| 8494.00                 | 92.90                | 359.80                    | 8246.06                   | 432.26    | 12.24     | 432.22                    | 432.44         | 1.62             | 18.39                         |
| 8526.00                 | 93.30                | 359.10                    | 8244.33                   | 464.21    | 11.93     | 464.18                    | 464.37         | 1.47             | 2.52                          |
| 8558.00                 | 93.60                | 359.50                    | 8242.40                   | 496.15    | 11.54     | 496.12                    | 496.29         | 1.33             | 1.56                          |
| 8590.00                 | 93.60                | 359.10                    | 8240.39                   | 528.09    | 11.15     | 528.05                    | 528.21         | 1.21             | 1.25                          |
| 8622.00                 | 95.30                | 359.50                    | 8237.91                   | 559.99    | 10.76     | 559.95                    | 560.09         | 1.10             | 5.46                          |
| 8653.00                 | 95.60                | 359.50                    | 8234.97                   | 590.85    | 10.49     | 590.81                    | 590.94         | 1.02             | .97                           |
| 8685.00                 | 95.60                | 359.10                    | 8231.84                   | 622.69    | 10.11     | 622.66                    | 622.77         | .93              | 1.24                          |
| 8780.00                 | 94.20                | .20                       | 8223.73                   | 717.34    | 9.53      | 717.31                    | 717.40         | .76              | 1.87                          |
| 8812.00                 | 93.70                | 359.80                    | 8221.53                   | 749.26    | 9.53      | 749.23                    | 749.32         | .73              | 2.00                          |
| 8907.00                 | 90.90                | 357.70                    | 8217.71                   | 844.15    | 7.46      | 844.12                    | 844.18         | .51              | 3.68                          |
| 9002.00                 | 92.20                | 356.60                    | 8215.14                   | 938.99    | 2.73      | 938.98                    | 939.00         | .17              | 1.79                          |
| 9097.00                 | 91.70                | 356.60                    | 8211.91                   | 1033.77   | -2.90     | 1033.77                   | 1033.77        | 359.84           | .53                           |
| 9193.00                 | 91.50                | 356.60                    | 8209.23                   | 1129.56   | -8.59     | 1129.58                   | 1129.60        | 359.56           | .21                           |
| 9287.00                 | 92.00                | 357.00                    | 8206.36                   | 1223.37   | -13.83    | 1223.41                   | 1223.45        | 359.35           | .68                           |
| 9382.00                 | 91.50                | 357.30                    | 8203.46                   | 1318.21   | -18.55    | 1318.26                   | 1318.34        | 359.19           | .61                           |
| 9477.00                 | 90.30                | 358.40                    | 8201.97                   | 1413.13   | -22.12    | 1413.19                   | 1413.30        | 359.10           | 1.71                          |
| 9573.00                 | 87.90                | 357.00                    | 8203.47                   | 1509.03   | -25.97    | 1509.10                   | 1509.25        | 359.01           | 2.89                          |
| 9668.00                 | 89.30                | 357.00                    | 8205.79                   | 1603.87   | -30.94    | 1603.95                   | 1604.17        | 358.89           | 1.47                          |
| 9763.00                 | 91.10                | .20                       | 8205.46                   | 1698.82   | -33.26    | 1698.92                   | 1699.15        | 358.88           | 3.86                          |
| 9859.00                 | 90.50                | .50                       | 8204.12                   | 1794.81   | -32.67    | 1794.90                   | 1795.11        | 358.96           | .70                           |
| 9954.00                 | 89.90                | 3.00                      | 8203.79                   | 1889.76   | -29.77    | 1889.84                   | 1889.99        | 359.10           | 2.71                          |
| 10049.00                | 90.70                | 3.30                      | 8203.29                   | 1984.61   | -24.55    | 1984.68                   | 1984.77        | 359.29           | .90                           |
| 10144.00                | 89.80                | 1.60                      | 8202.88                   | 2079.52   | -20.49    | 2079.57                   | 2079.62        | 359.44           | 2.02                          |
| 10240.00                | 91.40                | 2.30                      | 8201.87                   | 2175.46   | -17.22    | 2175.50                   | 2175.53        | 359.55           | 1.82                          |
| 10335.00                | 92.10                | 3.00                      | 8198.97                   | 2270.31   | -12.83    | 2270.34                   | 2270.35        | 359.68           | 1.04                          |
| 10430.00                | 91.50                | 2.30                      | 8195.99                   | 2365.16   | -8.44     | 2365.18                   | 2365.18        | 359.80           | .97                           |
| 10525.00                | 90.00                | 1.90                      | 8194.74                   | 2460.09   | -4.96     | 2460.09                   | 2460.09        | 359.88           | 1.63                          |
| 10620.00                | 90.10                | 2.30                      | 8194.66                   | 2555.02   | -1.48     | 2555.01                   | 2555.02        | 359.97           | .43                           |
| 10715.00                | 88.90                | 1.90                      | 8195.49                   | 2649.95   | 2.00      | 2649.93                   | 2649.95        | .04              | 1.33                          |
| 10812.00                | 89.40                | 1.20                      | 8196.93                   | 2746.91   | 4.62      | 2746.88                   | 2746.91        | .10              | .89                           |
| 10907.00                | 89.50                | .20                       | 8197.84                   | 2841.89   | 5.78      | 2841.86                   | 2841.90        | .12              | 1.06                          |
| 11003.00                | 89.20                | .20                       | 8198.93                   | 2937.89   | 6.12      | 2937.85                   | 2937.89        | .12              | .31                           |
| 11098.00                | 89.00                | 359.80                    | 8200.42                   | 3032.87   | 6.12      | 3032.84                   | 3032.88        | .12              | .47                           |
| 11194.00                | 90.30                | 359.10                    | 8201.01                   | 3128.86   | 5.20      | 3128.84                   | 3128.87        | .10              | 1.54                          |
| 11289.00                | 90.50                | 358.80                    | 8200.35                   | 3223.85   | 3.45      | 3223.82                   | 3223.85        | .06              | .38                           |
| 11384.00                | 91.50                | 358.40                    | 8198.69                   | 3318.80   | 1.13      | 3318.78                   | 3318.80        | .02              | 1.13                          |
| 11479.00                | 89.50                | 359.10                    | 8197.86                   | 3413.77   | -.94      | 3413.76                   | 3413.77        | 359.98           | 2.23                          |
| 11574.00                | 90.70                | 359.80                    | 8197.69                   | 3508.76   | -1.85     | 3508.75                   | 3508.76        | 359.97           | 1.46                          |
| 11670.00                | 90.70                | 359.50                    | 8196.52                   | 3604.75   | -2.44     | 3604.75                   | 3604.76        | 359.96           | .31                           |
| 11765.00                | 90.80                | 359.50                    | 8195.28                   | 3699.74   | -3.27     | 3699.74                   | 3699.74        | 359.95           | .11                           |
| 11860.00                | 90.10                | 358.00                    | 8194.53                   | 3794.71   | -5.34     | 3794.71                   | 3794.72        | 359.92           | 1.74                          |

| Measured<br>Depth<br>FT  | Incl<br>Angle<br>Deg | Drift<br>Direction<br>Deg | True<br>Vertical<br>Depth | N-S<br>FT | E-W<br>FT | Vertical<br>Section<br>FT | CLOSURE        |                  | Dogleg<br>Severity<br>Deg/100 |
|--------------------------|----------------------|---------------------------|---------------------------|-----------|-----------|---------------------------|----------------|------------------|-------------------------------|
|                          |                      |                           |                           |           |           |                           | Distance<br>FT | Direction<br>Deg |                               |
| 11955.00                 | 89.20                | 357.30                    | 8195.11                   | 3889.63   | -9.23     | 3889.64                   | 3889.64        | 359.86           | 1.20                          |
| 12051.00                 | 87.10                | 359.10                    | 8198.21                   | 3985.52   | -12.25    | 3985.54                   | 3985.54        | 359.82           | 2.88                          |
| 12146.00                 | 88.30                | 359.80                    | 8202.02                   | 4080.44   | -13.16    | 4080.46                   | 4080.46        | 359.82           | 1.46                          |
| 12241.00                 | 89.30                | .90                       | 8204.01                   | 4175.42   | -12.58    | 4175.43                   | 4175.43        | 359.83           | 1.56                          |
| 12336.00                 | 91.40                | .90                       | 8203.43                   | 4270.40   | -11.09    | 4270.41                   | 4270.41        | 359.85           | 2.21                          |
| 12432.00                 | 91.60                | 1.20                      | 8200.92                   | 4366.35   | -9.33     | 4366.36                   | 4366.36        | 359.88           | .38                           |
| 12527.00                 | 91.20                | 1.20                      | 8198.60                   | 4461.30   | -7.34     | 4461.30                   | 4461.30        | 359.91           | .42                           |
| 12622.00                 | 90.70                | .90                       | 8197.02                   | 4556.27   | -5.60     | 4556.27                   | 4556.27        | 359.93           | .61                           |
| 12717.00                 | 90.20                | 359.50                    | 8196.28                   | 4651.26   | -5.27     | 4651.26                   | 4651.27        | 359.94           | 1.56                          |
| Last Phoenix MWD Surveys |                      |                           |                           |           |           |                           |                |                  |                               |
| 12754.00                 | 89.90                | 358.40                    | 8196.25                   | 4688.26   | -5.94     | 4688.25                   | 4688.26        | 359.93           | 3.08                          |
| Projection to TD         |                      |                           |                           |           |           |                           |                |                  |                               |
| 12800.00                 | 89.90                | 358.40                    | 8196.33                   | 4734.24   | -7.23     | 4734.24                   | 4734.24        | 359.91           | .00                           |



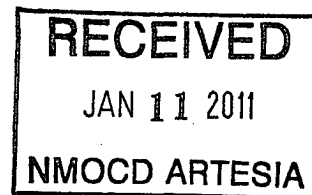
**PHOENIX**  
**TECHNOLOGY SERVICES**

30 Dec 2010

State of New Mexico  
Oil Conservation Division  
1301 W. Grand Av.  
Artesia N. M. 88210

Attention: To whom it may concern.

Re: Chesapeake Operating Inc.  
PLU Big Sinks 22 Federal 1H  
Eddy County, NM  
API #30-015-37838  
Job No. 1010711

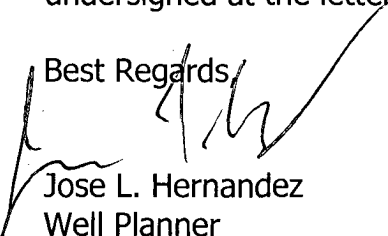


Enclosed please find the survey certification, and the original and one copy of the survey performed on the above referenced well by Phoenix technology Services, Inc. (P-5 No. 606018). Other information required by your office is as follows:

| Name & Title of Surveyor | Drainhole Number | Surveyed Depths |       | Dates Performed |          | Type of Survey |
|--------------------------|------------------|-----------------|-------|-----------------|----------|----------------|
|                          |                  | From            | To    | Start           | End      |                |
| Andres Alcala            | 1H               | 7811            | 12754 | 12/17/10        | 12/25/10 | 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.

Best Regards,

  
Jose L. Hernandez  
Well Planner

Certified mail receipt number: \_\_\_\_\_