

JAN 29 2015

State of West Virginia

Department of Environmental Protection - Office of Oil and Gas
WV Department of Environmental Protection
Well Operator's Report of Well Work

API 47-001-03255H County Barbour District Pleasant
Quad Philippi Pad Name PHL10HS Field/Pool Name Philippi
Farm Name WATSON, MARY LOU & RONALD EARL CATE Well Number PHL10EHS
Operator (as registered with the OOG) CNX Gas Company LLC
Address P.O. Box 1248 City Jane Lew State WV Zip 26378

As Drilled location NAD 83/UTM Attach an as-drilled plat, profile view, and deviation survey
Top Hole Northing 4,340,926.32 m Easting 583,174.17 m
Landing Point of Curve Northing 4,340,562.23 m Easting 582,960.62 m
Bottom Hole Northing 4,338,750.70 m Easting 584,027.81 m

Elevation (ft) 1618.50' GL Type of Well New Existing Type of Report Interim Final
Permit Type Deviated Horizontal Horizontal 6A Vertical Depth Type Deep Shallow
Type of Operation Convert Deepen Drill Plug Back Redrilling Rework Stimulate
Well Type Brine Disposal CBM Gas Oil Secondary Recovery Solution Mining Storage Other _____
Type of Completion Single Multiple Fluids Produced Brine Gas NGL Oil Other _____
Drilled with Cable Rotary

Drilled Media Surface hole Air Mud Fresh Water Intermediate hole Air Mud Fresh Water Brine
Production hole Air Mud Fresh Water Brine
Mud Type(s) and Additive(s)
Mineral Oil Based Mud, Bactericide, Polymers and Weighting Agents.

Date Permit Issued 10/13/2011 Date drilling commenced 09/04/2013 Date drilling ceased 03/30/2014
Date completion activities began 06/25/2014 Date completion activities ceased 07/17/2014
Verbal plugging (Y/N) N Date permission granted N/A Granted by N/A

Please note: Operator is required to submit a plugging application within 5 days of verbal permission to plu

Freshwater depth(s) ft 310', 580' Open mine(s) (Y/N) depths N
Salt water depth(s) ft 1850' Void(s) encountered (Y/N) depths N
Coal depth(s) ft None Reported Cavern(s) encountered (Y/N) depths N
Is coal being mined in area (Y/N) Y

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Reviewed by:

API 47-001-03255H Farm name WATSON, MARY LOU & RONALD EARL CATE Well number PHL10EHS

| CASING STRINGS | Hole Size | Casing Size | Depth | New or Used | Grade wt/ft | Basket Depth(s) | Did cement Circulate (Y/N) * Provide details to the right * |
|---------------------------|-----------|-------------|--------|-------------|--------------------|-----------------|--|
| Conductor | 26" | 20" | 112' | N | J-55 96# / 112' | N/A | Y |
| Surface | 17 1/2" | 13 3/8" | 640' | N | J-55 54.5# / 640' | 58'/139' | Y |
| Coal | - | - | - | - | - | - | - |
| Intermediate 1 | 12 1/4" | 9 5/8" | 2005' | N | J-55 36# / 2005' | 65'/145' | Y |
| Intermediate 2 | - | - | - | - | - | - | - |
| Intermediate 3 | - | - | - | - | - | - | - |
| Production | 8 3/4" | 5 1/2" | 15341' | N | P-110 20# / 15341' | N/A | N |
| Tubing | 5 1/2" | 2 3/8" | 8261' | N | P-110 4.7# / 8261' | N/A | N |
| Packer Type and Depth Set | | None | | | | | |

Comment Details _____

| CEMENT DATA | Class/Type of Cement | Number of Sacks | Slurry wt (ppg) | Yield (ft 3/sks) | Volume (ft 3) | Cement Top (MD) | WOC (hrs) |
|----------------|----------------------|-----------------|-----------------|------------------|---------------|-----------------|-----------|
| Conductor | Class A | 148 | 16.2 | 1.20 | 177 | Surface | 8 |
| Surface | Class A | 327 | 15.2 | 1.40 | 458 | Surface | 8 |
| Coal | - | - | - | - | - | - | - |
| Intermediate 1 | Class A | 529 | 15.2 | 1.20 | 635 | Surface | 8 |
| Intermediate 2 | - | - | - | - | - | - | - |
| Intermediate 3 | - | - | - | - | - | - | - |
| Production | Class A | 2603 | 14.8 | 1.25 | 3504 | 1878' | 8 |
| Tubing | - | - | - | - | - | - | - |

Drillers TD (ft) 7626' Loggers TD (ft) 7840'
 Deepest formation penetrated: Lower Marcellus Plug back to (ft) N/A
 Plug back procedure: N/A

Kick Off Depth (ft) 5310'

Check all wireline logs run caliper density deviated/directional induction
 neutron resistivity gamma ray temperature sonic

Well Cored Yes No Conventional Sidewall Were Cuttings Collected Yes No

DESCRIBE THE CENTRALIZER PLACEMENT USED FOR EACH CASING STRING _____
Conductor - No centralizers used.. Fresh Water - Bow spring centralizers on first joint then every fourth joint to 100 feet from surface.. Coal - Bow spring centralizers on first joint then every fourth joint to 100 feet from surface.. Intermediate - Bow spring centralizers one on the first two joints and every fourth joint until inside surface casing.. Production - Rigid bow spring centralizer on first joint then every 2 casing joints (free floating) through the lateral and the curve. (Note: cementing the 5 1/2" casing completely in open hole lateral and curve.)

WAS WELL COMPLETED AS SHOT HOLE Yes No DETAILS Plug and Perforation Shot Hole RECEIVED
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WAS WELL COMPLETED OPEN HOLE Yes No DETAILS _____ JAN 29 2015

WERE TRACERS USE Yes No TYPES OF TRACER(S) USED _____

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PERFORATION RECORD

| Stage No. | Perforation date | Perforated from MD ft. | Perforated to MD ft. | Number Of Perforations | Formation(s) |
|-----------|------------------|------------------------|----------------------|------------------------|--------------|
| 1 | 6/25/2014 | 15313 | 15243 | 48 | Marcellus |
| 2 | 6/25/2014 | 15204 | 14961 | 40 | Marcellus |
| 3 | 6/26/2014 | 14903 | 14660 | 40 | Marcellus |
| 4 | 6/27/2014 | 14602 | 14359 | 40 | Marcellus |
| 5 | 6/27/2014 | 14301 | 14058 | 40 | Marcellus |
| 6 | 6/28/2014 | 14000 | 13757 | 40 | Marcellus |
| 7 | 6/28/2014 | 13699 | 13456 | 40 | Marcellus |
| 8 | 6/29/2014 | 13398 | 13155 | 40 | Marcellus |
| 9 | 6/29/2014 | 13097 | 12854 | 40 | Marcellus |
| 10 | 6/30/2014 | 12796 | 12553 | 40 | Marcellus |
| 11 | 6/30/2014 | 12495 | 12252 | 40 | Marcellus |
| 12 | 7/1/2014 | 12194 | 11951 | 40 | Marcellus |
| 13 | 7/4/2014 | 11893 | 11650 | 40 | Marcellus |
| 14 | 7/5/2014 | 11592 | 11349 | 40 | Marcellus |
| 15 | 7/5/2014 | 11291 | 11048 | 40 | Marcellus |
| 16 | 7/7/2014 | 10990 | 10747 | 40 | Marcellus |
| 17 | 7/8/2014 | 10689 | 10446 | 40 | Marcellus |
| 18 | 7/9/2014 | 10388 | 10145 | 40 | Marcellus |
| 19 | 7/10/2014 | 10087 | 9844 | 40 | Marcellus |
| 20 | 7/11/2014 | 9786 | 9542 | 40 | Marcellus |
| 21 | 7/12/2014 | 9484 | 9240 | 40 | Marcellus |
| 22 | 7/13/2014 | 9182 | 8938 | 40 | Marcellus |
| 23 | 7/15/2014 | 8985 | 8863 | 40 | Marcellus |
| 24 | 7/17/2014 | 8578 | 8334 | 40 | Marcellus |

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STIMULATION INFORMATION PER STAGE

| Stage No. | Stimulations Date | Avg Pump Rate (BPM) | Avg Treatment Pressure (PSI) | Max Breakdown Pressure (PSI) | ISIP (PSI) | Amount of Proppant (lbs) | Amount of Water (bbls) | Amount of Nitrogen / other (gals) |
|-----------|-------------------|---------------------|------------------------------|------------------------------|------------|--------------------------|------------------------|-----------------------------------|
| 1 | 6/25/2014 | 47.3 | 8492 | 8784 | 6137 | 48450 | 11508 | 7985 |
| 2 | 6/25/2014 | 73.1 | 8463 | 8114 | 5114 | 649850 | 17888 | 4322 |
| 3 | 6/26/2014 | 77 | 8127 | 7598 | 5487 | 653084 | 12575 | 3906 |
| 4 | 6/27/2014 | 76 | 8205 | 7272 | 5122 | 647670 | 15326 | 4110 |
| 5 | 6/27/2014 | 80.4 | 8463 | 7703 | 5594 | 649040 | 15032 | 4127 |
| 6 | 6/28/2014 | 73 | 8397 | 8535 | 5303 | 650740 | 17214 | 4476 |
| 7 | 6/28/2014 | 77.2 | 8452 | 8267 | 5486 | 648330 | 14883 | 4113 |
| 8 | 6/29/2014 | 76 | 8349 | 8497 | 5196 | 657780 | 14202 | 4772 |
| 9 | 6/29/2014 | 82.3 | 8377 | 7693 | 5471 | 649130 | 11104 | 4294 |
| 10 | 6/30/2014 | 82 | 8412 | 7961 | 5380 | 660570 | 12801 | 4691 |
| 11 | 6/30/2014 | 81.9 | 8476 | 7657 | 5122 | 658170 | 10534 | 4171 |
| 12 | 7/1/2014 | 83 | 8592 | 7352 | 5444 | 659160 | 11449 | 4167 |
| 13 | 7/4/2014 | 86.3 | 8482 | 8384 | 5449 | 651370 | 12566 | 4281 |
| 14 | 7/5/2014 | 87.5 | 8362 | 8044 | 5308 | 656590 | 12447 | 4170 |
| 15 | 7/5/2014 | 88 | 8226 | 8460 | 5431 | 649560 | 10414 | 4114 |
| 16 | 7/7/2014 | 85 | 8008 | 8422 | 5885 | 650620 | 10494 | 4231 |
| 17 | 7/8/2014 | 87.7 | 8285 | 7839 | 5377 | 652790 | 15761 | 4292 |
| 18 | 7/9/2014 | 89.2 | 8258 | 8277 | 5243 | 649940 | 15398 | 4219 |
| 19 | 7/10/2014 | 94.5 | 8153 | 7173 | 5201 | 655720 | 12438 | 3929 |
| 20 | 7/11/2014 | 84 | 7935 | 7319 | 5867 | 655820 | 14606 | 4347 |
| 21 | 7/12/2014 | 91.9 | 7943 | 6322 | 5119 | 653180 | 13047 | 4011 |
| 22 | 7/13/2014 | 100 | 8069 | 6670 | 5239 | 650720 | 12962 | 3894 |
| 23 | 7/15/2014 | 90.2 | 7973 | 6586 | 5300 | 325290 | 6628 | 3328 |
| 24 | 7/17/2014 | 87 | 8014 | 7949 | 5242 | 656660 | 13137 | 3892 |

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| PRODUCING FORMATION(S) | DEPTHS | TVD | MD |
|------------------------|--------------|-----|----|
| MIDDLE MARCELLUS | 7827'- 7838' | | |
| | | | |
| | | | |

Please insert additional pages as applicable.

GAS TEST Build up Drawdown Open Flow OIL TEST Flow Pump
 SHUT-IN PRESSURE Surface 1400 psi Bottom Hole 4805 psi DURATION OF TEST 177 hrs
 OPEN FLOW Gas 5162 mcfpd Oil 0 bpd NGL 0 bpd Water 1218 bpd GAS MEASURED BY Estimated Orifice Pilot

| LITHOLOGY / FORMATION | TOP DEPTH IN FT TVD | BOTTOM DEPTH IN FT TVD | TOP DEPTH IN FT MD | BOTTOM DEPTH IN FT MD | DESCRIBE ROCK TYPE AND RECORD QUANTITY TYPE OF FLUID (FRESHWATER, BRINE, GAS, H2S, ETC) |
|-----------------------|---------------------|------------------------|--------------------|-----------------------|---|
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | SEE ATTACHED |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

Please insert additional pages as applicable.

Drilling Contractor Nabors Drilling USA
 Address 515 West Greens Road, Ste 1000 City Houston State TX Zip 77067
 Logging Company Horizon
 Address 7136 South Yale, Suite 414 City Tulsa State OK Zip 74136-6378
 Cementing Company CalFrac
 Address 2001 Summit View Rd City Smithfield State PA Zip 15478
 Stimulating Company CalFrac
 Address 2001 Summit View Rd City Smithfield State PA Zip 15478

Please insert additional pages as applicable.

Completed by CNX Gas WV Operations Company, LLC - Drilling and Completions Telephone 304-884-2000
 Signature [Signature] Title Steve Spitler - Completions Manager-Gas WV Date 1/23/15

Submittal of Hydraulic Fracturing Chemical Disclosure Information

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 Environmental Protection Registry

API 47-001-03255H

Farm name **WATSON, MARY LOU &
RONALD EARL CATE**

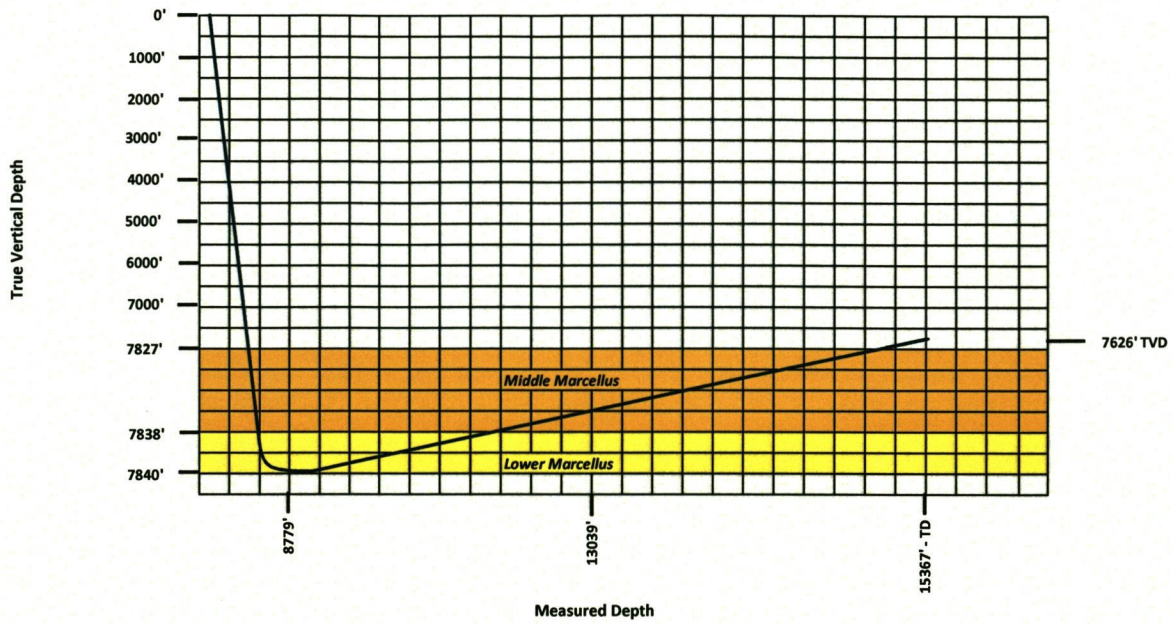
Well number **PHL10EHS**

| LITHOLOGY / FORMATION | TOP | BOTTOM | TOP | BOTTOM | DESCRIBE ROCK TYPE AND RECORD QUANTITY TYPE OF FLUID (FRESHWATER,BRINE,GAS,H2S, ETC) |
|--------------------------|-------------|-------------|-------------|-------------|--|
| | DEPTH IN FT | DEPTH IN FT | DEPTH IN FT | DEPTH IN FT | |
| | TVD | TVD | MD | MD | |
| FILL | 0 | 100 | | | |
| SAND | 100 | 240 | | | Light Gray |
| SHALE | 240 | 300 | | | Dark Gray |
| SHALE | 300 | 470 | | | Light Gray |
| SAND | 470 | 500 | | | Light Gray |
| SHALE | 500 | 720 | | | Gray |
| SAND | 720 | 950 | | | Light Gray |
| SHALE | 950 | 1100 | | | Light Gray |
| SANDY/SHALE | 1100 | 1160 | | | Dark Gray |
| SAND | 1160 | 1400 | | | Light Gray |
| SHALE | 1400 | 1660 | | | Dark Gray |
| REDROCK | 1660 | 1700 | | | Red |
| LIME | 1700 | 1950 | | | Tan |
| SHALE | 1950 | 1980 | | | Dark Gray |
| SAND | 1980 | 2200 | | | Gray |
| SHALE | 2200 | | | | Light Gray |
| FOURTH SAND | 2307 | 2340 | | | |
| SPEECHLEY | 3160 | 3171 | | | |
| BALLTOWN | 3345 | 3381 | | | |
| BRADFORD | 3647 | 3889 | | | |
| RILEY | 4077 | 4258 | | | |
| BENSON | 4471 | 4537 | | | |
| FIRST ELK | 4703 | 4761 | | | |
| SECOND ELK | 4855 | 4935 | | | |
| THIRD ELK | 5114 | 5152 | | | |
| FOURTH ELK | 5385 | 5423 | | | |
| SYCAMORE GRIT | 6711 | 7115 | | | |
| FRIB | 7115 | 7570 | | | |
| BURKETT | 7570 | 7592 | | | |
| TULLY LIMESTONE | 7592 | 7649 | | | |
| HAMILTON SHALE | 7649 | 7809 | | | |
| UPPER MARCELLUS | 7809 | 7827 | | | |
| MIDDLE MARCELLUS | 7827 | 7838 | | | |
| LOWER MARCELLUS | 7838 | 7840 | | | |

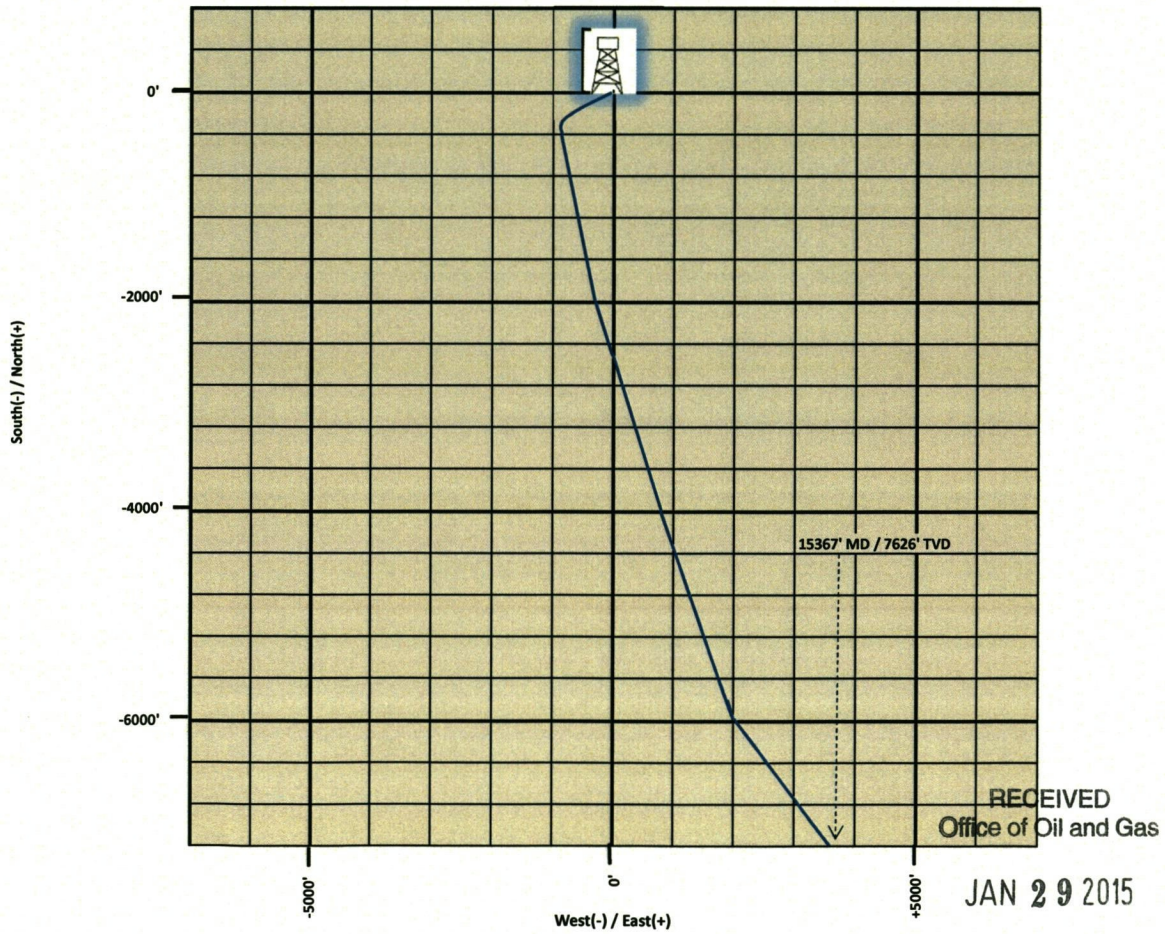
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CNX PHL10EHS - Views Profile View



As Drilled View



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CNX PHL10EHS ST02 Gyro+MWD 0ft to update Survey Report

(Non-Def Survey)

| | | | |
|--------------------------------------|---|---|------------------------------|
| Report Date: | March 29, 2014 - 04:37 PM | Survey / DLS Computation: | Minimum Curvature / Lubinski |
| Client: | CNX | Vertical Section Azimuth: | 159.525 ° (Grid North) |
| Field: | WV Barbour County (NAD27) | Vertical Section Origin: | 0.000 ft, 0.000 ft |
| Structure / Slot: | CNX PHL10 Pad / PHL10EHS | TVD Reference Datum: | KB |
| Well: | PHL10EHS | TVD Reference Elevation: | 1628.340 ft above MSL |
| Borehole: | ST02 | Seabed / Ground Elevation: | 1605.840 ft above MSL |
| UWI / API#: | Unknown / Unknown | Magnetic Declination: | -9.520 ° |
| Survey Name: | CNX PHL10EHS ST02 Gyro+MWD 0ft to update | Total Gravity Field Strength: | 999.2716mgn (9.80665 Based) |
| Survey Date: | March 22, 2014 | Gravity Model: | GARM |
| Tort / AND / DDI / ERD Ratio: | 244.405 ° / 8546.823 ft / 6.612 / 1.090 | Total Magnetic Field Strength: | 52196.950 nT |
| Coordinate Reference System: | NAD27 West Virginia State Plane, Northern Zone, US Feet | Magnetic Dip Angle: | 66.398 ° |
| Location Lat / Long: | N 39° 12' 48.73425", W 80° 2' 12.37047" | Declination Date: | March 22, 2014 |
| Location Grid N/E Y/X: | N 260339.195 ftUS, E 1847908.127 ftUS | Magnetic Declination Model: | HDGM 2013 |
| CRS Grid Convergence Angle: | -0.3423 ° | North Reference: | Grid North |
| Grid Scale Factor: | 0.99996649 | Grid Convergence Used: | -0.3423 ° |
| Version / Patch: | 2.7.1043.0 | Total Corr Mag North->Grid North: | -9.1779 ° |

Local Coord Referenced To: Well Head

| Comments | MD (ft) | Incl (°) | Azim Grid (°) | TVD (ft) | VSEC (ft) | NS (N/S ft) | EW (E/W ft) | Closure (ft) | Closure Azimuth (°) | DLS (°/100ft) | TF (°) |
|--------------|---------|----------|---------------|----------|-----------|-------------|-------------|--------------|---------------------|---------------|---------|
| Projected-Up | 0.00 | 0.00 | 0.00 | 0.00 | -0.24 | N 0.24 | W 0.04 | 0.00 | 349.65 | N/A | 349.65M |
| SHL | 110.50 | 0.28 | 349.65 | 110.50 | -0.51 | N 0.51 | W 0.09 | 0.27 | 349.65 | 0.25 | 349.99M |
| | 210.50 | 0.22 | 349.99 | 210.50 | -0.94 | N 0.94 | W 0.17 | 0.71 | 349.72 | 0.06 | 358.2M |
| | 310.50 | 0.15 | 358.20 | 310.50 | -1.25 | N 1.26 | W 0.21 | 1.03 | 350.63 | 0.07 | 24.95M |
| | 410.50 | 0.10 | 24.95 | 410.50 | -1.43 | N 1.47 | W 0.17 | 1.23 | 353.21 | 0.08 | 43.99M |
| | 510.50 | 0.14 | 43.99 | 510.50 | -1.55 | N 1.63 | W 0.05 | 1.39 | 358.15 | 0.06 | 84.14M |
| | 610.50 | 0.24 | 84.14 | 610.50 | -1.55 | N 1.74 | E 0.24 | 1.53 | 358.15 | 0.16 | 75.53M |
| | 710.50 | 0.18 | 75.53 | 710.50 | -1.48 | N 1.80 | E 0.60 | 1.69 | 18.44 | 0.07 | 82.81M |
| | 810.50 | 0.15 | 82.81 | 810.50 | -1.43 | N 1.86 | E 0.88 | 1.86 | 25.42 | 0.04 | 76.3M |
| | 910.50 | 0.19 | 76.30 | 910.50 | -1.38 | N 1.91 | E 1.17 | 2.07 | 31.53 | 0.04 | 64.82M |
| | 1010.50 | 0.31 | 64.82 | 1010.49 | -1.38 | N 2.07 | E 1.58 | 2.44 | 37.38 | 0.13 | 54.3M |
| | 1110.50 | 0.34 | 54.30 | 1110.49 | -1.48 | N 2.36 | E 2.07 | 2.99 | 41.24 | 0.07 | 45.88M |
| | 1210.50 | 0.29 | 45.88 | 1210.49 | -1.66 | N 2.71 | E 2.49 | 3.53 | 42.60 | 0.07 | 43.88M |
| | 1310.50 | 0.25 | 43.88 | 1310.49 | -1.86 | N 3.04 | E 2.82 | 4.00 | 42.87 | 0.04 | 34.26M |
| | 1410.50 | 0.14 | 34.26 | 1410.49 | -2.03 | N 3.30 | E 3.04 | 4.34 | 42.69 | 0.11 | 59.57M |
| | 1510.50 | 0.20 | 59.57 | 1510.49 | -2.13 | N 3.49 | E 3.26 | 4.63 | 43.08 | 0.09 | 86.67M |
| | 1610.50 | 0.21 | 86.67 | 1610.49 | -2.10 | N 3.59 | E 3.59 | 4.94 | 45.07 | 0.10 | 80.58M |
| | 1710.50 | 0.29 | 80.58 | 1710.49 | -2.00 | N 3.64 | E 4.03 | 5.30 | 47.90 | 0.08 | 85.79M |
| | 1810.50 | 0.24 | 85.79 | 1810.49 | -1.89 | N 3.69 | E 4.48 | 5.70 | 50.52 | 0.06 | 113.22M |
| | 1910.50 | 0.30 | 113.22 | 1910.49 | -1.65 | N 3.61 | E 4.93 | 6.01 | 53.84 | 0.14 | 102.26M |
| | 2010.50 | 0.39 | 102.26 | 2010.48 | -1.29 | N 3.43 | E 5.51 | 6.40 | 58.08 | 0.11 | 119.88M |
| | 2110.50 | 0.25 | 119.88 | 2110.48 | -0.94 | N 3.25 | E 6.03 | 6.78 | 61.68 | 0.17 | 124.56M |
| | 2210.50 | 0.67 | 124.56 | 2210.48 | -0.29 | N 2.81 | E 6.70 | 7.22 | 67.25 | 0.42 | 127.07M |
| | 2310.50 | 0.52 | 127.07 | 2310.47 | 0.57 | N 2.20 | E 7.54 | 7.84 | 73.71 | 0.15 | 126.79M |
| | 2410.50 | 0.54 | 126.79 | 2410.47 | 1.35 | N 1.65 | E 8.28 | 8.44 | 78.75 | 0.02 | 129.4M |
| | 2510.50 | 0.56 | 129.40 | 2510.46 | 2.17 | N 1.06 | E 9.04 | 9.12 | 83.34 | 0.03 | 141.38M |
| | 2610.50 | 0.45 | 141.38 | 2610.46 | 2.97 | N 0.44 | E 9.66 | 9.71 | 87.40 | 0.15 | 148.84M |
| | 2710.50 | 0.49 | 148.84 | 2710.46 | 3.76 | S 0.23 | E 10.13 | 10.18 | 91.32 | 0.07 | 149.52M |
| | 2810.50 | 0.34 | 149.52 | 2810.45 | 4.47 | S 0.86 | E 10.50 | 10.60 | 94.66 | 0.15 | 138.52M |
| | 2910.50 | 0.31 | 138.52 | 2910.45 | 5.02 | S 1.31 | E 10.83 | 10.98 | 96.92 | 0.17 | 141.56M |
| | 3010.50 | 0.31 | 141.56 | 3010.45 | 5.53 | S 1.73 | E 11.18 | 11.39 | 98.79 | 0.02 | 145.9M |
| | 3110.50 | 0.34 | 145.90 | 3110.45 | 6.07 | S 2.19 | E 11.51 | 11.81 | 100.75 | 0.04 | 139.26M |
| | 3210.50 | 0.34 | 139.26 | 3210.45 | 6.64 | S 2.66 | E 11.87 | 12.26 | 102.61 | 0.04 | 141.32M |
| | 3310.50 | 0.78 | 141.32 | 3310.44 | 7.57 | S 3.41 | E 12.49 | 13.05 | 105.28 | 0.44 | 145.94M |
| | 3410.50 | 0.75 | 145.94 | 3410.43 | 8.85 | S 4.49 | E 13.28 | 14.14 | 108.66 | 0.07 | 148.72M |
| | 3510.50 | 0.44 | 148.72 | 3510.43 | 9.86 | S 5.36 | E 13.85 | 14.98 | 111.15 | 0.31 | 173.53M |
| | 3610.50 | 0.26 | 173.53 | 3610.43 | 10.46 | S 5.91 | E 14.07 | 15.40 | 112.78 | 0.23 | 224.52M |
| | 3710.50 | 0.35 | 224.52 | 3710.43 | 10.81 | S 6.35 | E 13.88 | 15.41 | 114.59 | 0.27 | 249.04M |
| | 3810.50 | 0.50 | 249.04 | 3810.42 | 10.94 | S 6.73 | E 13.26 | 15.02 | 116.90 | 0.23 | 253.3M |
| | 3910.50 | 0.53 | 253.30 | 3910.42 | 10.91 | S 7.02 | E 12.41 | 14.41 | 119.48 | 0.05 | 266.47M |
| | 4010.50 | 0.90 | 266.47 | 4010.41 | 10.66 | S 7.20 | E 11.18 | 13.47 | 122.76 | 0.40 | 280.68M |
| | 4110.50 | 1.16 | 280.68 | 4110.39 | 9.90 | S 7.06 | E 9.41 | 11.94 | 126.89 | 0.36 | 284.84M |
| | 4210.50 | 1.65 | 284.84 | 4210.36 | 8.55 | S 6.50 | E 7.02 | 9.76 | 132.81 | 0.50 | 275.6M |
| | 4310.50 | 1.13 | 275.60 | 4310.33 | 7.28 | S 6.04 | E 4.65 | 7.84 | 142.42 | 0.56 | 251.89M |
| | 4410.50 | 0.79 | 251.89 | 4410.32 | 6.82 | S 6.16 | E 3.01 | 7.09 | 153.94 | 0.52 | 233.43M |
| | 4510.50 | 0.62 | 233.43 | 4510.31 | 6.94 | S 6.69 | E 1.92 | 7.20 | 163.99 | 0.28 | 204.29M |
| | 4610.50 | 0.50 | 204.29 | 4610.31 | 7.40 | S 7.41 | E 1.31 | 7.77 | 170.01 | 0.30 | 174.97M |
| | 4710.50 | 0.48 | 174.97 | 4710.31 | 8.11 | S 8.23 | E 1.16 | 8.55 | 171.95 | 0.25 | 162.48M |
| | 4810.50 | 0.42 | 162.48 | 4810.30 | 8.88 | S 8.99 | E 1.31 | 9.33 | 171.71 | 0.11 | 164.33M |
| | 4910.50 | 0.43 | 164.33 | 4910.30 | 9.62 | S 9.70 | E 1.52 | 10.07 | 171.09 | 0.02 | 146.53M |
| | 5010.50 | 0.47 | 146.53 | 5010.30 | 10.40 | S 10.41 | E 1.85 | 10.82 | 169.92 | 0.14 | 130.88M |
| | 5110.50 | 0.44 | 130.88 | 5110.29 | 11.13 | S 11.00 | E 2.37 | 11.50 | 167.86 | 0.13 | 127.37M |
| | 5210.50 | 0.62 | 127.37 | 5210.29 | 11.93 | S 11.58 | E 3.09 | 12.23 | 165.08 | 0.18 | 132.52M |
| | 5310.50 | 0.76 | 132.52 | 5310.28 | 12.98 | S 12.36 | E 4.01 | 13.23 | 162.04 | 0.15 | 189.8M |
| | 5368.50 | 1.40 | 189.80 | 5368.27 | 13.93 | S 13.32 | E 4.17 | 14.20 | 162.62 | 2.03 | 212M |
| | 5413.50 | 4.70 | 212.00 | 5413.20 | 15.53 | S 15.42 | E 3.10 | 16.64 | 168.64 | 7.65 | 219.3M |
| | 5458.50 | 7.80 | 219.30 | 5457.93 | 18.19 | S 19.35 | E 0.19 | 19.59 | 179.45 | 7.10 | 224.6M |
| | 5503.50 | 10.70 | 224.60 | 5502.34 | 21.49 | S 24.69 | W 4.68 | 25.15 | 190.74 | 6.71 | 105.6R |
| | 5548.50 | 13.00 | 226.50 | 5546.38 | 25.23 | S 31.15 | W 11.29 | 33.34 | 199.92 | 5.18 | 8.48R |
| | 5593.50 | 15.10 | 227.70 | 5590.03 | 29.39 | S 38.58 | W 19.30 | 43.33 | 206.57 | 4.71 | 1.09L |
| | 5638.50 | 16.60 | 227.60 | 5633.32 | 33.97 | S 46.86 | W 28.38 | 54.85 | 211.20 | 3.33 | 2.01R |
| | 5683.50 | 18.40 | 227.80 | 5676.24 | 39.00 | S 55.96 | W 38.39 | 68.74 | 214.45 | 4.00 | 2.15R |
| | 5728.50 | 21.30 | 228.10 | 5718.56 | 44.61 | S 66.19 | W 49.73 | 82.96 | 216.92 | 6.45 | HS |
| | 5773.50 | 24.10 | 228.10 | 5760.07 | 50.96 | S 77.79 | W 62.66 | 100.05 | 218.85 | 6.22 | 5.65R |
| | 5818.50 | 25.40 | 228.40 | 5800.93 | 57.79 | S 90.33 | W 76.56 | 118.67 | 220.34 | 2.90 | 71.6R |
| | 5863.50 | 25.90 | 231.60 | 5841.50 | 64.30 | S 102.85 | W 91.88 | 139.50 | 221.70 | 3.27 | 126.55R |
| | 5908.50 | 25.40 | 233.20 | 5882.07 | 70.03 | S 114.73 | W 107.07 | 161.50 | 223.02 | 1.90 | 7.6R |
| | 5953.50 | 26.40 | 233.50 | 5922.55 | 75.51 | S 126.46 | W 122.84 | 176.44 | 224.17 | 2.24 | 18.03R |

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| Comments | MD (ft) | Incl (°) | Azim Grid (°) | TVD (ft) | VSEC (ft) | NS (N/S ft) | EW (E/W ft) | Closure (ft) | Closure Azimuth (°) | DLS (°/100ft) | TF (°) |
|----------|----------|----------|---------------|----------|-----------|-------------|-------------|--------------|---------------------|---------------|---------|
| | 5998.50 | 28.30 | 234.80 | 5962.51 | 80.98 | S 138.57 | W 139.60 | 196.83 | 225.21 | 4.43 | 20.32R |
| | 6043.50 | 29.50 | 235.70 | 6001.91 | 86.34 | S 150.96 | W 157.47 | 218.27 | 226.21 | 2.84 | HS |
| | 6088.50 | 29.70 | 235.70 | 6041.04 | 91.65 | S 163.48 | W 175.83 | 240.22 | 227.08 | 0.44 | HS |
| Tie-In | 6133.50 | 29.80 | 235.70 | 6080.11 | 96.99 | S 176.07 | W 194.27 | 262.32 | 227.81 | 0.22 | 42.58R |
| | 6178.50 | 33.20 | 241.20 | 6118.48 | 101.45 | S 188.31 | W 214.32 | 285.42 | 228.70 | 9.89 | 15.79L |
| | 6223.50 | 34.40 | 240.60 | 6155.87 | 105.20 | S 200.49 | W 236.19 | 309.93 | 229.67 | 2.77 | 137.67L |
| | 6268.50 | 33.50 | 239.10 | 6193.20 | 109.42 | S 213.10 | W 257.92 | 334.69 | 230.44 | 2.73 | 156.79L |
| | 6313.50 | 32.50 | 238.30 | 6230.94 | 114.02 | S 225.83 | W 278.86 | 358.96 | 231.00 | 2.42 | 149.51L |
| | 6358.50 | 31.70 | 237.40 | 6269.06 | 118.86 | S 238.56 | W 299.11 | 382.71 | 231.43 | 2.07 | 149.61L |
| | 6403.50 | 31.00 | 236.60 | 6307.49 | 123.93 | S 251.31 | W 318.75 | 406.01 | 231.75 | 1.81 | 140.03L |
| | 6448.50 | 30.40 | 235.60 | 6346.18 | 129.27 | S 264.12 | W 337.81 | 428.92 | 231.98 | 1.75 | 56.96R |
| SHL | 6493.50 | 30.60 | 236.20 | 6384.96 | 134.65 | S 276.92 | W 356.73 | 451.71 | 232.18 | 0.81 | 116.36R |
| | 6538.50 | 30.50 | 236.60 | 6423.71 | 139.84 | S 289.58 | W 375.78 | 474.52 | 232.38 | 0.50 | 142.19L |
| | 6583.50 | 29.80 | 235.50 | 6462.62 | 145.10 | S 302.20 | W 394.53 | 497.08 | 232.55 | 1.98 | 149.55L |
| | 6628.50 | 28.90 | 234.40 | 6501.85 | 150.65 | S 314.86 | W 412.58 | 519.12 | 232.65 | 2.33 | 35.35L |
| | 6673.50 | 29.60 | 233.40 | 6541.11 | 156.58 | S 327.82 | W 430.35 | 541.10 | 232.70 | 1.90 | 71.64L |
| Tie-In | 6718.50 | 29.70 | 232.80 | 6580.22 | 162.87 | S 341.19 | W 448.15 | 563.36 | 232.72 | 0.70 | 154.27L |
| | 6763.50 | 28.90 | 232.00 | 6619.46 | 169.35 | S 354.62 | W 465.80 | 585.38 | 232.71 | 1.98 | 131.53R |
| | 6793.00 | 28.51 | 232.93 | 6645.33 | 173.51 | S 363.25 | W 476.83 | 599.55 | 232.70 | 2.01 | 156.64R |
| | 6840.00 | 23.15 | 238.94 | 6687.63 | 178.42 | S 374.79 | W 493.71 | 619.97 | 232.80 | 12.68 | 162.08R |
| | 6888.00 | 18.34 | 243.95 | 6732.51 | 180.88 | S 382.98 | W 508.59 | 636.77 | 233.02 | 10.67 | 110.06L |
| | 6935.00 | 17.40 | 232.06 | 6777.26 | 183.71 | S 390.55 | W 520.78 | 651.07 | 233.13 | 8.00 | 16.22R |
| | 6983.00 | 19.92 | 234.20 | 6822.73 | 188.03 | S 399.75 | W 533.07 | 666.42 | 233.13 | 5.44 | 79.91R |
| | 7030.00 | 20.81 | 243.95 | 6866.80 | 190.96 | S 408.10 | W 547.07 | 682.63 | 233.28 | 7.45 | 90.63R |
| | 7077.00 | 20.86 | 248.83 | 6910.73 | 191.87 | S 414.79 | W 562.38 | 698.91 | 233.59 | 3.69 | 12.98L |
| | 7124.00 | 21.48 | 248.44 | 6954.56 | 192.13 | S 420.98 | W 578.19 | 715.31 | 233.94 | 1.35 | 47.46L |
| | 7172.00 | 22.20 | 246.40 | 6999.12 | 192.79 | S 427.84 | W 594.67 | 732.69 | 234.27 | 2.18 | 112.32L |
| | 7219.00 | 21.73 | 243.09 | 7042.71 | 194.25 | S 435.33 | W 610.56 | 749.97 | 234.51 | 2.82 | 54.67L |
| | 7266.00 | 22.39 | 240.71 | 7086.27 | 196.60 | S 443.65 | W 626.13 | 767.48 | 234.68 | 2.36 | 36.84R |
| | 7313.00 | 23.54 | 242.84 | 7129.54 | 199.06 | S 452.31 | W 642.29 | 785.67 | 234.85 | 3.02 | 85.41R |
| | 7361.00 | 23.79 | 247.96 | 7173.51 | 200.45 | S 460.32 | W 659.79 | 804.60 | 235.10 | 4.31 | 136.41L |
| | 7408.00 | 22.74 | 245.32 | 7216.69 | 201.37 | S 467.67 | W 676.84 | 822.79 | 235.36 | 3.15 | 78.91L |
| | 7456.00 | 23.68 | 236.52 | 7260.82 | 204.22 | S 476.87 | W 693.31 | 841.57 | 235.48 | 7.48 | 51.8L |
| | 7504.00 | 26.00 | 230.19 | 7304.38 | 209.87 | S 488.92 | W 709.44 | 861.70 | 235.43 | 7.35 | 46.87L |
| | 7550.00 | 28.49 | 224.85 | 7345.28 | 217.80 | S 503.16 | W 724.92 | 882.53 | 235.24 | 7.58 | 52.9L |
| | 7597.00 | 30.46 | 219.95 | 7386.20 | 228.36 | S 520.24 | W 740.48 | 905.07 | 234.91 | 6.82 | 49.43L |
| | 7645.00 | 33.02 | 214.70 | 7427.03 | 241.84 | S 540.33 | W 755.75 | 929.14 | 234.44 | 7.84 | 48.43L |
| | 7692.00 | 35.47 | 210.11 | 7465.88 | 257.81 | S 562.66 | W 769.88 | 953.68 | 233.84 | 7.57 | 47.88L |
| | 7739.00 | 38.11 | 205.54 | 7503.53 | 276.55 | S 587.55 | W 782.98 | 979.03 | 233.12 | 8.09 | 54.13L |
| | 7786.00 | 41.52 | 198.84 | 7539.64 | 298.69 | S 615.40 | W 794.27 | 1004.90 | 232.23 | 11.65 | 52.77L |
| | 7834.00 | 44.20 | 193.98 | 7574.83 | 324.81 | S 646.71 | W 803.46 | 1031.51 | 231.17 | 8.86 | 54.57L |
| | 7881.00 | 47.07 | 188.71 | 7607.70 | 353.36 | S 679.64 | W 810.02 | 1057.50 | 230.00 | 10.07 | 46.12L |
| | 7928.00 | 50.32 | 184.43 | 7638.73 | 384.80 | S 714.70 | W 814.03 | 1083.38 | 228.72 | 9.72 | 42.32L |
| | 7975.00 | 53.53 | 180.86 | 7667.72 | 418.82 | S 751.64 | W 815.71 | 1109.34 | 227.34 | 9.08 | 49.67L |
| | 8022.00 | 56.45 | 176.83 | 7694.69 | 455.14 | S 790.11 | W 814.91 | 1135.19 | 225.89 | 9.37 | 28.81L |
| | 8069.00 | 59.49 | 174.90 | 7719.61 | 493.37 | S 829.84 | W 812.03 | 1161.19 | 224.38 | 7.34 | 30.64L |
| | 8117.00 | 63.35 | 172.36 | 7742.57 | 534.24 | S 871.72 | W 807.33 | 1188.29 | 222.80 | 9.29 | 42.07L |
| | 8164.00 | 65.89 | 169.87 | 7762.72 | 575.84 | S 913.66 | W 800.77 | 1215.06 | 221.23 | 7.22 | 49.28L |
| | 8212.00 | 67.33 | 168.07 | 7781.77 | 619.29 | S 956.90 | W 792.34 | 1242.52 | 219.63 | 4.57 | 47.64L |
| | 8259.00 | 70.69 | 164.22 | 7798.61 | 662.87 | S 999.49 | W 781.82 | 1269.10 | 218.03 | 10.47 | 32.06L |
| | 8306.00 | 74.70 | 161.63 | 7812.59 | 707.65 | S 1042.36 | W 768.63 | 1295.28 | 216.40 | 10.02 | 22.49L |
| | 8353.00 | 79.22 | 159.73 | 7823.20 | 753.41 | S 1085.56 | W 753.48 | 1321.60 | 214.76 | 10.39 | 30.19L |
| | 8401.00 | 83.52 | 157.22 | 7830.40 | 800.84 | S 1129.69 | W 736.07 | 1348.51 | 213.09 | 10.34 | 68.09L |
| | 8448.00 | 85.15 | 153.19 | 7835.04 | 847.47 | S 1172.14 | W 716.46 | 1373.94 | 211.44 | 9.21 | 38.57L |
| | 8496.00 | 88.49 | 150.53 | 7837.70 | 894.96 | S 1214.39 | W 693.86 | 1398.82 | 209.74 | 8.89 | 45L |
| | 8527.00 | 89.24 | 149.78 | 7838.32 | 925.54 | S 1241.27 | W 678.44 | 1414.77 | 208.66 | 3.42 | 105.58L |
| | 8590.00 | 88.90 | 148.56 | 7839.34 | 987.50 | S 1295.36 | W 646.15 | 1447.77 | 206.51 | 2.01 | 28.02R |
| | 8685.00 | 89.52 | 148.89 | 7840.65 | 1080.81 | S 1376.55 | W 596.84 | 1500.57 | 203.44 | 0.74 | 35.8L |
| | 8779.00 | 90.13 | 148.45 | 7840.94 | 1173.13 | S 1456.84 | W 547.96 | 1556.69 | 200.61 | 0.80 | 41.56R |
| | 8874.00 | 90.66 | 148.92 | 7840.28 | 1266.43 | S 1538.00 | W 498.59 | 1617.01 | 197.96 | 0.75 | 5.11L |
| | 8969.00 | 91.89 | 148.81 | 7838.17 | 1359.76 | S 1619.29 | W 449.48 | 1680.74 | 195.51 | 1.30 | 138.87L |
| | 9063.00 | 91.10 | 148.12 | 7835.71 | 1451.99 | S 1699.38 | W 400.34 | 1746.12 | 193.26 | 1.12 | 78.68R |
| | 9158.00 | 91.19 | 148.57 | 7833.82 | 1545.16 | S 1780.23 | W 350.49 | 1814.63 | 191.14 | 0.48 | 54.58R |
| | 9254.00 | 93.12 | 151.29 | 7830.21 | 1639.74 | S 1863.24 | W 302.43 | 1887.85 | 189.22 | 3.47 | 110.3R |
| | 9348.00 | 92.95 | 151.75 | 7825.23 | 1732.69 | S 1945.75 | W 257.67 | 1962.97 | 187.54 | 0.52 | 88.92R |
| | 9443.00 | 93.03 | 156.57 | 7820.27 | 1827.12 | S 2031.11 | W 216.33 | 2042.83 | 186.08 | 5.07 | 81.59R |
| | 9538.00 | 93.30 | 158.41 | 7815.02 | 1921.91 | S 2118.73 | W 180.01 | 2126.60 | 184.86 | 1.95 | 79.65L |
| | 9632.00 | 93.65 | 156.48 | 7809.33 | 2015.67 | S 2205.38 | W 144.03 | 2210.31 | 183.74 | 2.08 | 97.79L |
| | 9727.00 | 93.21 | 153.30 | 7803.64 | 2110.18 | S 2291.23 | W 103.79 | 2293.82 | 182.59 | 3.37 | 90L |
| | 9821.00 | 93.21 | 151.33 | 7798.38 | 2203.29 | S 2374.34 | W 60.19 | 2375.34 | 181.45 | 2.09 | 50.66R |
| | 9916.00 | 93.39 | 151.55 | 7792.91 | 2297.19 | S 2457.64 | W 14.85 | 2457.92 | 180.35 | 0.30 | 150.99R |
| | 10011.00 | 93.30 | 151.60 | 7787.37 | 2391.11 | S 2541.04 | E 30.30 | 2541.47 | 179.32 | 0.11 | 132.99R |
| | 10105.00 | 93.03 | 151.89 | 7782.18 | 2484.10 | S 2623.72 | E 74.73 | 2625.02 | 178.37 | 0.42 | 144.42L |
| | 10199.00 | 91.80 | 151.01 | 7778.21 | 2577.09 | S 2706.21 | E 119.61 | 2709.10 | 177.47 | 1.81 | 80.51R |
| | 10294.00 | 92.07 | 152.63 | 7775.01 | 2671.17 | S 2789.90 | E 164.45 | 2794.99 | 176.63 | 1.73 | 90R |
| | 10388.00 | 92.07 | 152.90 | 7771.61 | 2764.46 | S 2873.42 | E 207.44 | 2881.15 | 175.87 | 0.29 | 41.52L |
| | 10483.00 | 92.51 | 152.51 | 7767.82 | 2858.71 | S 2957.78 | E 250.97 | 2968.65 | 175.15 | 0.62 | 143.99L |
| | 10577.00 | 92.07 | 152.19 | 7764.06 | 2951.90 | S 3040.98 | E 294.56 | 3055.45 | 174.47 | 0.58 | 82.04L |
| | 10672.00 | 92.24 | 150.97 | 7760.49 | 3045.92 | S 3124.47 | E 339.74 | 3143.13 | 173.79 | 1.30 | 98.85L |
| | 10767.00 | 92.07 | 149.88 | 7756.91 | 3139.66 | S 3207.03 | E 386.59 | 3230.49 | 173.13 | 1.16 | 53.87L |
| | 10861.00 | 92.42 | 149.40 | 7753.23 | 3232.19 | S 3288.08 | E 434.07 | 3316.85 | 172.48 | 0.83 | 135.02R |
| | 10956.00 | 92.07 | 149.75 | 7749.51 | 3325.69 | S 3369.93 | E 482.14 | 3404.49 | 171.86 | 0.52 | 122.75L |
| | 11050.00 | 91.98 | 149.61 | 7746.19 | 3418.24 | S 3451.02 | E 529.56 | 3491.66 | 171.28 | 0.18 | 114.24R |
| | 11145.00 | 91.89 | 149.81 | 7742.98 | 3511.80 | S 3533.01 | E 577.45 | 3580.13 | 170.72 | 0.23 | 68.61R |
| | 11239.00 | 91.98 | 150.04 | 7739.81 | 3604.43 | S 3614.31 | E 624.53 | 3668.11 | 170.20 | 0.26 | 50.27L |
| | 11334.00 | 92.42 | 149.51 | 7736.16 | 3697.99 | S 3696.33 | E 672.32 | 3757.22 | 169.69 | 0.72 | 109.44R |
| | 11429.00 | 92.24 | 150.02 | 7732.30 | 3791.54 | S 3778.34 | E 720.11 | 3846.59 | 169.21 | 0.57 | 165.59L |
| | 11523.00 | 91.89 | 149.93 | 7728.91 | 3884.17 | S 3859.67 | E 767.12 | 3935.41 | 168.76 | 0.38 | 43.64L |
| | 11618.00 | 92.33 | 149.51 | 7725.41 | 3977.72 | S 3941.66 | E 814.99 | 4025.27 | 167.83 | 0.64 | 90R |
| | 11713.00 | 92.33 | 149.54 | 7721.55 | 4071.20 | S 4023.46 | E 863.13 | 4115.25 | 167.83 | 0.03 | 142.15R |
| | 11807.00 | 92.24 | 149.61 | 7717.80 | 4163.71 | S 4104.45 | E 910.69 | 4204.52 | 167.00 | 0.42 | 154.5R |
| | 11902.00 | | | | | | | | | | |

| Comments | MD (ft) | Incl (°) | Azim Grid (°) | TVD (ft) | VSEC (ft) | NS (N/S ft) | EW (E/W ft) | Closure (ft) | Closure Azimuth (°) | DLS (°/100ft) | TF (°) |
|----------|----------|----------|---------------|----------|-----------|-------------|-------------|--------------|---------------------|---------------|---------|
| | 12565.00 | 91.80 | 151.23 | 7693.47 | 4910.72 | S 4760.16 | E 1290.11 | 4932.13 | 164.84 | 0.41 | 106.07L |
| | 12660.00 | 91.63 | 150.64 | 7690.63 | 5004.61 | S 4843.16 | E 1336.24 | 5024.36 | 164.58 | 0.65 | 76.36L |
| | 12755.00 | 91.71 | 150.31 | 7687.86 | 5098.39 | S 4925.79 | E 1383.04 | 5116.51 | 164.32 | 0.36 | 127.1L |
| | 12850.00 | 90.31 | 148.46 | 7686.18 | 5191.88 | S 5007.53 | E 1431.41 | 5208.34 | 164.05 | 2.44 | 81.44R |
| | 12945.00 | 90.48 | 149.59 | 7685.53 | 5285.29 | S 5088.98 | E 1480.30 | 5300.15 | 163.78 | 1.20 | 90L |
| | 13039.00 | 90.48 | 149.20 | 7684.74 | 5377.82 | S 5169.88 | E 1528.16 | 5391.25 | 163.53 | 0.41 | 109.18L |
| | 13134.00 | 90.40 | 148.97 | 7684.01 | 5471.24 | S 5251.38 | E 1576.96 | 5483.29 | 163.29 | 0.26 | 74.05L |
| | 13229.00 | 90.48 | 148.69 | 7683.28 | 5564.59 | S 5332.66 | E 1626.13 | 5575.33 | 163.04 | 0.31 | 100.78R |
| | 13323.00 | 90.40 | 149.11 | 7682.56 | 5656.98 | S 5413.15 | E 1674.68 | 5666.53 | 162.81 | 0.45 | 48.37L |
| | 13418.00 | 90.48 | 149.02 | 7681.83 | 5750.39 | S 5494.63 | E 1723.52 | 5758.85 | 162.58 | 0.13 | 28.21R |
| | 13512.00 | 91.71 | 149.68 | 7680.03 | 5842.90 | S 5575.49 | E 1771.43 | 5850.37 | 162.37 | 1.48 | 58.42L |
| | 13607.00 | 92.33 | 148.67 | 7676.69 | 5936.29 | S 5657.01 | E 1820.08 | 5942.84 | 162.17 | 1.25 | 175.1L |
| | 13702.00 | 91.98 | 148.64 | 7673.11 | 6029.52 | S 5738.09 | E 1869.46 | 6035.19 | 161.95 | 0.37 | 56.28L |
| | 13797.00 | 92.24 | 148.25 | 7669.62 | 6122.69 | S 5818.99 | E 1919.14 | 6127.54 | 161.75 | 0.49 | 143.14R |
| | 13891.00 | 91.80 | 148.58 | 7666.30 | 6214.87 | S 5899.01 | E 1968.35 | 6218.98 | 161.55 | 0.58 | 73.79R |
| | 13986.00 | 91.98 | 149.20 | 7663.17 | 6308.18 | S 5980.31 | E 2017.40 | 6311.66 | 161.36 | 0.68 | 79.19R |
| | 14080.00 | 92.33 | 151.04 | 7659.63 | 6400.85 | S 6061.75 | E 2064.20 | 6403.81 | 161.19 | 1.99 | 70.88L |
| | 14175.00 | 92.51 | 150.52 | 7655.62 | 6494.66 | S 6144.59 | E 2110.53 | 6497.19 | 161.04 | 0.58 | 123.86R |
| | 14269.00 | 91.98 | 151.31 | 7651.94 | 6587.53 | S 6226.67 | E 2156.19 | 6589.67 | 160.90 | 1.01 | 90R |
| | 14364.00 | 91.98 | 151.40 | 7648.66 | 6681.51 | S 6309.99 | E 2201.70 | 6683.32 | 160.76 | 0.09 | 90L |
| | 14459.00 | 91.98 | 151.04 | 7645.38 | 6775.46 | S 6393.21 | E 2247.41 | 6776.96 | 160.63 | 0.38 | 152.79R |
| | 14554.00 | 91.28 | 151.40 | 7642.67 | 6869.42 | S 6476.44 | E 2293.13 | 6870.66 | 160.50 | 0.83 | 121.54R |
| | 14648.00 | 91.01 | 151.84 | 7640.79 | 6962.51 | S 6559.12 | E 2337.80 | 6963.53 | 160.38 | 0.55 | 99.82R |
| | 14743.00 | 90.92 | 152.36 | 7639.19 | 7056.70 | S 6643.07 | E 2382.25 | 7057.54 | 160.27 | 0.56 | 81.73R |
| | 14837.00 | 91.01 | 152.98 | 7637.61 | 7150.02 | S 6726.56 | E 2425.40 | 7150.71 | 160.17 | 0.67 | 90R |
| | 14932.00 | 91.01 | 153.15 | 7635.94 | 7244.40 | S 6811.25 | E 2468.43 | 7244.98 | 160.08 | 0.18 | 76.25L |
| | 15027.00 | 91.63 | 150.61 | 7633.75 | 7338.52 | S 6895.00 | E 2513.19 | 7338.99 | 159.97 | 2.75 | 121.06L |
| | 15121.00 | 91.10 | 149.73 | 7631.51 | 7431.24 | S 6976.52 | E 2559.93 | 7431.60 | 159.85 | 1.09 | 90L |
| | 15215.00 | 91.10 | 149.46 | 7629.70 | 7523.82 | S 7057.58 | E 2607.50 | 7524.10 | 159.72 | 0.29 | 90R |
| | 15289.00 | 91.10 | 149.81 | 7628.28 | 7596.70 | S 7121.42 | E 2644.90 | 7596.96 | 159.62 | 0.47 | HS |
| PRJ TD | 15367.00 | 91.10 | 149.81 | 7626.79 | 7673.57 | S 7188.83 | E 2684.11 | 7673.81 | 159.53 | 0.00 | |

Survey Type: Non-Def Survey

Survey Error Model: ISCWSA Rev 0 *** 3-D 95.000% Confidence 2.7955 sigma

Survey Program:

| Description | Part | MD From (ft) | MD To (ft) | EOU Freq (ft) | Hole Size (in) | Casing Diameter (in) | Survey Tool Type | Borehole / Survey |
|-------------|------|--------------|------------|---------------|----------------|----------------------|--------------------------|---|
| | 1 | 0.000 | 10.500 | Act Stns | 30.000 | 30.000 | SLB_NSG+MSHOT-Depth Only | Original Borehole / CNX PHL10EHS Gyro+MWD Off to 6530ft MD (Projected-Up) |
| | 1 | 10.500 | 22.500 | Act Stns | 30.000 | 30.000 | SLB_NSG+MSHOT-Depth Only | Original Borehole / CNX PHL10EHS Gyro+MWD Off to 6530ft MD |
| | 1 | 22.500 | 110.500 | Act Stns | 30.000 | 30.000 | SLB_NSG+MSHOT-Depth Only | Original Borehole / CNX PHL10EHS Gyro+MWD Off to 6530ft MD (Projected-Up) |
| | 1 | 110.500 | 5310.500 | Act Stns | 30.000 | 30.000 | SLB_NSG+MSHOT | Original Borehole / CNX PHL10EHS Gyro+MWD Off to 6530ft MD |
| | 1 | 5310.500 | 6133.500 | Act Stns | 30.000 | 30.000 | SLB_MWD-STD | Original Borehole / CNX PHL10EHS Gyro+MWD Off to ST01 / CNX PHL10EHS ST01 6123ft to 7156ft MD |
| | 1 | 6133.500 | 6763.500 | Act Stns | 30.000 | 30.000 | SLB_MWD-STD | ST02 / CNX PHL10EHS ST02 Gyro+MWD Off to update |
| | 1 | 6763.500 | 15289.000 | Act Stns | 30.000 | 30.000 | SLB_MWD-STD | ST02 / CNX PHL10EHS ST02 Gyro+MWD Off to update |
| | 1 | 15289.000 | 15367.000 | Act Stns | 30.000 | 30.000 | SLB_BLIND | |

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Hydraulic Fracturing Fluid Product Component Information Disclosure

| | |
|--------------------------------|--------------------|
| Job Start Date: | 6/25/2014 |
| Job End Date: | 7/17/2014 |
| State: | West Virginia |
| County: | Barbour |
| API Number: | 47-001-03255-00-00 |
| Operator Name: | CONSOL Energy Inc. |
| Well Name and Number: | PHL-10E |
| Longitude: | -80.03666740 |
| Latitude: | 39.21342400 |
| Datum: | NAD83 |
| Federal/Tribal Well: | NO |
| True Vertical Depth: | 7,840 |
| Total Base Water Volume (gal): | 13,427,196 |
| Total Base Non Water Volume: | 0 |



Hydraulic Fracturing Fluid Composition:

| Trade Name | Supplier | Purpose | Ingredients | Chemical Abstract Service Number (CAS #) | Maximum Ingredient Concentration in Additive (% by mass)** | Maximum Ingredient Concentration in HF Fluid (% by mass)** | Comments |
|---|----------------|--|---|--|--|--|----------|
| Water | Customer & CWS | Base Fluid & Mix Water | Water | 7732-18-5 | 100.00000 | 87.85537 | |
| Sand (Proppant), DAP-903, DWP-111, DWP-614, DWP-901, BioClear 2000, DWP-NE1 | CWS | Propping Agent, Scale Inhibitor, Gel Slurry, Viscosifier, Breaker, Biocide, Non-Emulsifier | Crystalline silica (Quartz) | 14808-60-7 | 100.00000 | 11.74343 | |
| | | | Hydrochloric acid | 7647-01-0 | 35.00000 | 0.17655 | |
| | | | Distillates (petroleum), hydrotreated middle | 64742-46-7 | 60.00000 | 0.04972 | |
| | | | 2-Propenoic acid, polymer with 2-propenamides, sodium salt | 25987-30-8 | 40.00000 | 0.03713 | |
| | | | Guar gum | 9000-30-0 | 60.00000 | 0.02187 | |
| | | | Calcite | 471-34-1 | 1.00000 | 0.01978 | |
| | | | 2,2-Dibromo-3-Nitropropionamide | 10222-01-2 | 20.00000 | 0.01350 | |
| | | | Polyethylene glycol mixture | 25322-68-3 | 70.00000 | 0.01350 | |
| | | | Dimethylcocoamine, bis (chloroethyl) ether, diquatary ammonium salt | 68607-28-3 | 40.00000 | 0.00966 | |
| | | | Isopropanol | 67-63-0 | 40.00000 | 0.00966 | |

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| | | | | | |
|--|--|---|------------|-----------|---------|
| | | 2-Propenoic acid, polymer with sodium phosphonate | 71050-62-9 | 60.00000 | 0.00725 |
| | | Illite | 12173-60-3 | 1.00000 | 0.00639 |
| | | Goethite | 1310-14-1 | 0.10000 | 0.00519 |
| | | Methanol | 67-56-1 | 15.00000 | 0.00514 |
| | | Sorbitan monooleate | 1338-43-8 | 5.00000 | 0.00464 |
| | | Poly(oxyethylene)nonylphenol ether | 9016-45-9 | 5.00000 | 0.00464 |
| | | Apatite | 64476-38-6 | 0.10000 | 0.00331 |
| | | Biotite | 1302-27-8 | 0.10000 | 0.00331 |
| | | Ilmenite | 98072-94-7 | 0.10000 | 0.00237 |
| | | Quaternary ammonium compounds, bis(hydrogenated tallow alkyl)dimethyl, salts with bentonite | 68953-58-2 | 5.00000 | 0.00182 |
| | | Diallyldimethylammonium chloride | 7398-69-8 | 5.00000 | 0.00121 |
| | | Alkenes, C>10 a- | 64743-02-8 | 0.10000 | 0.00076 |
| | | Fatty acids, tall-oil | 61790-12-3 | 0.10000 | 0.00076 |
| | | Alcohols, C14-15, ethoxylated | 68951-67-7 | 0.10000 | 0.00076 |
| | | Modified thiourea polymer | 68527-49-1 | 0.10000 | 0.00076 |
| | | Ammonium Persulfate | 7727-54-0 | 100.00000 | 0.00066 |
| | | Oxirane, 2-methyl-, polymer with oxirane, monodecyl ether | 37251-67-5 | 1.50000 | 0.00055 |
| | | Propargyl Alcohol | 107-19-7 | 0.10000 | 0.00025 |
| | | Formaldehyde | 50-00-0 | 0.10000 | 0.00005 |
| | | Sodium chloride | 7647-14-5 | 0.10000 | 0.00003 |

Ingredients shown above are subject to 29 CFR 1910.1200(i) and appear on Material Safety Data Sheets (MSDS). Ingredients shown below are Non-MSDS.

* Total Water Volume sources may include fresh water, produced water, and/or recycled water

** Information is based on the maximum potential for concentration and thus the total may be over 100%

Note: For Field Development Products (products that begin with FDP), MSDS level only information has been provided.

Ingredient information for chemicals subject to 29 CFR 1910.1200(i) and Appendix D are obtained from suppliers Material Safety Data Sheets (MSDS)

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