

APPROVED

NAME: *Jacqueline Thornton*

DATE: *2/11/2016*

Well Operator's Report of Well Work



Where energy meets innovation.

Well Number: 513145

API: 47 - 017 - 06459

Submission: Initial Amended

Notes: Reperf Stg 3.1

Correction to Production Cement Top
(MD)

RECEIVED
Office of Oil and Gas

DEC 21 2015

WV Department of
Environmental Protection

WS AX 03/24/16
03/25/2016

State of West Virginia
Department of Environmental Protection - Office of Oil and Gas
Well Operator's Report of Well Work

API 47 - 170 - 6459 County DODDRIDGE District WEST UNION
Quad OXFORD 7.5' Pad Name OXFORD 157 Field/Pool Name _____
Farm name JUSTIN L. HENDERSON ET AL Well Number 513145
Operator (as registered with the OOG) EQT Production Company
Address 625 Liberty Ave. EQT Plaza, Suite 1700 City Pittsburgh State PA Zip 15222

As Drilled location NAD 83/UTM Attach an as-drilled plat, profile view, and deviation survey
Top hole Northing 4,343,008 Easting 520,177
→ Landing Point of Curve Northing _____ Easting _____
→ Bottom Hole Northing 4,341,953 Easting 520,691

Elevation (ft) 970 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

Drilling 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)
Water base Mud 12.5 ppg barium sulfate, sodium chloride, xanthan gum, polyanionic cellulose, modified starch, sodium hydroxide, phosphonates and alkyl phosphates, glutaraldehyde solution, calcium hydroxide.
partially hydrolyzed polyacrylamide/polyacrylate, potassium chloride, sodium carbonate, ground walnut shells, alcohol and modified fatty acid, ferrochrome lignosulfonate, calcium carbonate, fibrous cellulose

Date permit issued 04/18/2014 Date drilling commenced 08/18/2014 Date drilling ceased 12/17/2014
Date completion activities began 5/5/2015 Date completion activities ceased 5/6/2015
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 plug

Freshwater depth(s) ft 144 Open mine(s) (Y/N) depths N
Salt water depth(s) ft - Void(s) encountered (Y/N) depths N
Coal depth(s) ft 337 Cavern(s) encountered (Y/N) depths N
Is coal being mined in area (Y/N) N

Reviewed by: _____

03/25/2016

API 47-170 - 6459 Farm name JUSTIN L. HENDERSON ET AL Well number 513145

| CASING STRINGS | Hole Size | Casing Size | Depth | New or Used | Grade wt/ft | Basket Depth(s) | Did cement circulate (Y/ N) * Provide details below* |
|---------------------------|-----------|-------------|---------|-------------|----------------|-------------------|---|
| Conductor | 24" | 20" | 63' | NEW | A-500 40LB/FT | NONE | Y |
| Surface | 17.5" | 13.375" | 946' | NEW | J-55 54.5LB/FT | 271' | Y |
| Coal | | | | | | | |
| Intermediate 1 | 12.375" | 9.625" | 5,020' | NEW | P-110 40LB/FT | 1283',2934',3601' | Y |
| Intermediate 2 | | | | | | | |
| Intermediate 3 | | | | | | | |
| Production | 8.5" | 5.5" | 10,287' | NEW | P-110 20LB/FT | None. | N |
| Tubing | | | | | | | |
| Packer type and depth set | | | | | | | |

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 | 61 | 15.6 | 1.18 | 71.98 | 0 | 8 |
| Surface | CLASS A | 790 | 15.6 | 1.19 | 940.1 | 0 | 8 |
| Coal | | | | | | | |
| Intermediate 1 | CLASS A / CLASS A | 360 / 340 | 14.2 / 15.6 | 1.28 / 1.18 | 862 | 0 | 8 |
| Intermediate 2 | | | | | | | |
| Intermediate 3 | | | | | | | |
| Production | Class A / Class H | 280 / 495 | 14.2 / 15.2 | 1.26 / 1.97 | 1328 | 4,558' | 72 |
| Tubing | | | | | | | |

Drillers TD (ft) 10,301' Loggers TD (ft) N/A
 Deepest formation penetrated Marcellus Plug back to (ft) N/A
 Plug back procedure N/A

Kick off depth (ft) 5,078'

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- NONE

SURFACE- JOINTS: 1,11,21

INTERMEDIATE- RAN AT LEAST EVERY 500' FEET JOINTS: 1,12,24,36,48,60,72,84,97,109,121

PRODUCTION- Composite bodied centralizers every joint up to 4,250'

WAS WELL COMPLETED AS SHOT HOLE Yes No DETAILS _____

WAS WELL COMPLETED OPEN HOLE? Yes No DETAILS _____

WERE TRACERS USED Yes No TYPE OF TRACER(S) USED _____

API 47- 017 - 6459 Farm name JUSTIN L. HENDERSON ET AL Well number 513145

PERFORATION RECORD

| Stage No. | Perforation date | Perforated from MD ft | Perforated to MD ft | Number of Perforations | Formation(s) |
|-----------|------------------|-----------------------|---------------------|------------------------|---------------------|
| | | | | | Please See Attached |
| | | | | | |
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Please insert additional pages as applicable.

STIMULATION INFORMATION PER STAGE

Complete a separate record for each stimulation stage.

| Stage No | Stimulations Date | Ave Pump Rate (BPM) | Ave Treatment Pressure (PSI) | Max Breakdown Pressure (PSI) | ISIP (PSI) | Amount of Proppant (lbs) | Amount of Water (hbls) | Amount of Nitrogen/other (units) |
|----------|-------------------|---------------------|------------------------------|------------------------------|------------|--------------------------|------------------------|----------------------------------|
| | | | | | | Please | See | Attached |
| | | | | | | | | |
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Please insert additional pages as applicable.

API 47- 170 - 6459 Farm name JUSTIN L. HENDERSON ET AL Well number 513145

| <u>PRODUCING FORMATION(S)</u> | <u>DEPTHS</u> | | |
|-------------------------------|---------------|------------|-------------------------|
| <u>Marcellus</u> | <u>6,365'</u> | <u>TVD</u> | <u>6,583'</u> <u>MD</u> |
| _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ |

Please insert additional pages as applicable.

GAS TEST Build up Drawdown Open Flow OIL TEST Flow Pump

SHUT-IN PRESSURE Surface 1,810 psi Bottom Hole N/A psi DURATION OF TEST 95.5 hrs

OPEN FLOW Gas 9,941 mcfpd Oil N/A bpd NGL 63.7 bpd Water 449.3 bpd GAS MEASURED BY Estimated Orifice Pilot

| LITHOLOGY/ FORMATION | TOP DEPTH IN FT NAME TVD | BOTTOM DEPTH IN FT TVD | TOP DEPTH IN FT MD | BOTTOM DEPTH IN FT MD | DESCRIBE ROCK TYPE AND RECORD QUANTITY AND TYPE OF FLUID (FRESHWATER, BRINE, OIL, GAS, H ₂ S, ETC) |
|-------------------------|--------------------------------|------------------------------|--------------------------|-----------------------------|--|
| | <u>0</u> | | <u>0</u> | | |
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Please insert additional pages as applicable.

Drilling Contractor ALPHA HUNTER DRILLING (RIG 4)
Address P.O. BOX 430 City RENO State OH Zip 45773

Logging Company HOSSCO SERVICES, LLC
Address 614 TROTTERS LANE City CHARLESTON State WV Zip 25312

Cementing Company NABORS CEMENTING SERVICES
Address 2504 SMITH CREEK ROAD City WAYNESBURG State PA Zip 15370

Stimulating Company Keane
Address 2121 Sage Road City Houston State TX Zip 77056

Please insert additional pages as applicable.

Completed by Brad Maddox Telephone 412-395-7053
Signature [Signature] Title Director of Drilling Date 12/9/2015

Submittal of Hydraulic Fracturing Chemical Disclosure Information Attach copy of FRACFOCUS Registry

03/25/2016

WR-35
Rev. 8/23/13

Page ___ of ___

API 47- 017 - 6459 Farm name JUSTIN L. HENDERSON ET AL Well number 513145

Drilling Contractor Patterson UTI (Rig 252)
Address 207 Carlton Drive City Eighty Four State PA Zip 15330

Logging Company GYRODATA
Address 601 MAYER ST City BRIDGEVILLE State PA Zip 15017

Logging Company _____
Address _____ City _____ State _____ Zip _____

Cementing Company _____
Address _____ City _____ State _____ Zip _____

03/25/2016

513145 Final Formations API #47-017-06459

| Formation Name | Final Top MD (ftGL) (ft) | Final Top TVD (ft) | Final Btm MD (ftGL) (ft) | Final Btm TVD (ft) |
|----------------------|--------------------------|--------------------|--------------------------|--------------------|
| FRESH WATER ZONE | 1 | | 154 | |
| SAND/SHALE | 1 | | 347 | |
| PITTSBURGH COAL SEAM | 347 | | 351 | |
| SAND/SHALE | 351 | | 1,599.00 | |
| BIG LIME | 1,599.00 | | 1,884.00 | |
| WEIR | 1,884.00 | | 2,089.00 | |
| BEREA | 2,089.00 | | 2,093.00 | |
| GANTZ | 2,093.00 | | 2,204.00 | |
| 50F | 2,204.00 | | 2,294.00 | |
| 30F | 2,294.00 | | 2,349.00 | |
| GORDON | 2,349.00 | | 2,438.00 | |
| 4TH | 2,438.00 | | 2,660.00 | |
| BAYARD | 2,660.00 | | 2,933.00 | |
| WARREN | 2,933.00 | | 3,010.00 | |
| SPEECHLEY | 3,010.00 | | 3,499.00 | |
| BALLTOWN A | 3,499.00 | | 4,146.00 | |
| RILEY | 4,146.00 | | 4,596.00 | |
| BENSON | 4,596.00 | | 4,849.00 | |
| ALEXANDER | 4,849.00 | | 6,064.00 | 6,008.60 |
| SONYEA | 6,064.00 | 6,008.60 | 6,226.00 | 6,150.00 |
| MIDDLESEX | 6,226.00 | 6,150.00 | 6,290.00 | 6,199.90 |
| GENESEE | 6,290.00 | 6,199.90 | 6,420.00 | 6,286.60 |
| GENESEO | 6,420.00 | 6,286.60 | 6,470.00 | 6,314.40 |
| TULLY | 6,470.00 | 6,314.40 | 6,520.00 | 6,338.40 |
| HAMILTON | 6,520.00 | 6,338.40 | 6,588.00 | 6,365.20 |
| MARCELLUS | 6,588.00 | 6,365.20 | | |

03/25/2016

EQT Production - Marcellus

Doddridge County, WV Grid

Doddridge County 513145

Well #513145

Mian Wellbore

Design: 513145 As Drilled Surveys

Standard Survey Report

22 December, 2014

03/25/2016

Phoenix Technologies

Survey Report

| | | |
|--|--|--|
| Database: EDM 5000 1 Single User Db | Local Co-ordinate Reference: Sigs Doodridge County 513145 | |
| Company: EQ1 Production - Marcellus | TVD Reference: KB@23ft @ 991.0usft | |
| Project: Doddridge County, WV Grid | MD Reference: KB@23ft @ 991.0usft | |
| Site: Doddridge County 513145 | North Reference: Grid | |
| Well: Well #513145 | Survey Calculation Method: Minimum Curvature | |
| Wellbore: Mian Wellbore | | |
| Design: 513145 As Drilled Surveys | | |

| | | |
|---|-------------------------------------|-----------------------------|
| Project Doddridge County, WV Grid | | |
| Map System: US State Plane 1927 (Exact solution) | System Datum: Mean Sea Level | |
| Geo Datum: NAD 1927 (NADCON CONUS) | | |
| Map Zone: West Virginia North 4701 | | Using geodetic scale factor |

| | | | | | |
|---------------------------------------|--|-----------------------------------|----------------------------------|--|--|
| Site Doddridge County 513145 | | | | | |
| Site Position: | | Northing: 270 614 39 usft | Latitude: 39 24 | | |
| From: Map | | Easting: 1 641 301.80 usft | Longitude: -80 77 | | |
| Position Uncertainty: 0 0 usft | | Slot Radius: 13-3/16 " | Grid Convergence: -0 81 " | | |

| | | | | | |
|-----------------------------|-----------------------|-----------------------------------|-----------------------------------|--|--|
| Well Well #513145 | | | | | |
| Well Position | +N/-S 0.0 usft | Northing: 270 614 39 usft | Latitude: 39° 14' 9.798 N | | |
| | +E/-W 0.0 usft | Easting: 1 641,3 1 80 usft | Longitude: 80 45' 58.955 W | | |
| Position Uncertainty | 0 0 usft | Wellhead Elevation: usft | Ground Level: 968 0 usft | | |

| | | | | | |
|-------------------------------|-------------------|--------------------|------------------------|----------------------|----------------------------|
| Wellbore Mian Wellbore | | | | | |
| Magnetics | Model Name | Sample Date | Declination (°) | Dip Angle (°) | Field Strength (nT) |
| | IGRF2010_14 | 12/6/2014 | -8.49 | 66.72 | 52,208 |

| | | | | | |
|---|----------------------|--------------------------|--|--|--|
| Design 513145 As Drilled Surveys | | | | | |
| Audit Notes: | | | | | |
| Version: 1 0 | Phase: ACTUAL | Tie On Depth: 0 0 | | | |

| | | | | |
|--------------------------|--------------------------------|---------------------|---------------------|----------------------|
| Vertical Section: | Depth From (TVD) (usft) | +N/-S (usft) | +E/-W (usft) | Direction (°) |
| | 0 0 | 0 0 | 0 0 | 155 00 |

| | | |
|-----------------------|------------------|-----------------------------------|
| Survey Program | | Date 12/22/2014 |
| From (') | To (usft) | Survey (Wellbore) |
| 0.00 | 4 991 0 513145 | Gyrodata Gyros (Mian Wellbore) |
| 0 00 | 10,301 0 513145 | PHX MWD (Mian Wellbore) |
| | | Tool Name |
| | | GYD_DP_MS |
| | | MWD+IGRF |
| | | Description |
| | | Gyrodata gyro-compassing and drop |
| | | MWD+IGRF v3 standard declination |

| Survey | | | | | | | | | | |
|-----------------------|-----------------|-------------|-----------------------|---------------------|--------------|--------------|-------------------------|-------------------------|------------------------|-----------------------|
| Measured Depth (usft) | Inclination (°) | Azimuth (°) | Vertical Depth (usft) | Subsea Depth (usft) | +N/-S (usft) | +E/-W (usft) | Vertical Section (usft) | Dogleg Rate (°/100usft) | Build Rate (°/100usft) | Turn Rate (°/100usft) |
| 0 0 | 0 00 | 0 00 | 0 0 | -991 0 | 0 0 | 0 0 | 0 | 0 00 | 0 00 | 0 00 |
| 110 0 | 0 12 | 28 07 | 110 0 | -881 0 | 0 1 | 0 1 | - 1 | 0 11 0 11 | | 0 |
| 210 0 | 0 10 | 346 77 | 210 0 | -781 0 | 0 3 | 0 1 | -0 2 | 0 08 -0 02 | | -41 30 |
| 310 0 | 0 11 | 338 89 | 310 0 | -681 0 | 0 5 | 0 0 | -0 4 | 0 02 0 01 | | -7 88 |
| 410 0 | 0 12 | 330 97 | 410 0 | -581 0 | 0 6 | -0 1 | -0 6 | 0 02 0 01 | | -7 92 |
| 510 0 | 0 14 | 339 86 | 510 0 | -481 0 | 0 8 | -0 1 | -0 8 | 0 03 0 02 | | 8 89 |
| 610 0 | 0 09 | 324 30 | 610 0 | -381 0 | 1 0 | -0 2 | -1 0 | 0 06 -0 05 | | -15 56 |
| 710 0 | 0 10 | 347 18 | 710 0 | -281 0 | 1 2 | -0 3 | -1 2 | 0 04 0 01 | | 22 88 |

Phoenix Technologies
Survey Report

| | | | |
|------------------|----------------------------|-------------------------------------|------------------------------|
| Database: | EDM 5000.1 Single User DB | Local Co-ordinate Reference: | Site Doddridge County 513145 |
| Company: | ECT Production - Marcellus | TVD Reference: | KB 238 @ 891 00ft |
| Project: | Doddridge County, WV Crd | MD Reference: | KB 238 @ 891 00ft |
| Site: | Doddridge County 513145 | North Reference: | Grid |
| Well: | Well #513145 | Survey Calculation Method: | Minimum Curvature |
| Wellbore: | Main Wellbore | | |
| Design: | 513145 As Drilled Surveys | | |

Survey

| Measured Depth (usft) | Inclination (°) | Azimuth (°) | Vertical Depth (usft) | Subsea Depth (usft) | +N/-S (usft) | +E/-W (usft) | Vertical Section (usft) | Dogleg Rate (°/100usft) | Build Rate (°/100usft) | Turn Rate (°/100usft) |
|-----------------------|-----------------|-------------|-----------------------|---------------------|--------------|--------------|-------------------------|-------------------------|------------------------|-----------------------|
| 810.0 | 0.05 | 126.18 | 810.0 | -181.0 | 1.2 | -0.3 | -1.2 | 0.14 | -0.05 | 139.00 |
| 910.0 | 0.14 | 254.24 | 910.0 | -81.0 | 1.2 | -0.4 | -1.2 | 0.18 | 0.09 | 128.06 |
| 1,010.0 | 0.57 | 260.52 | 1,010.0 | 19.0 | 1.1 | -1.0 | -1.4 | 0.43 | 0.43 | 6.28 |
| 1,110.0 | 0.82 | 255.06 | 1,110.0 | 119.0 | 0.8 | -2.2 | -1.6 | 0.26 | 0.25 | -5.46 |
| 1,210.0 | 0.85 | 251.45 | 1,210.0 | 219.0 | 0.4 | -3.6 | -1.8 | 0.06 | 0.03 | -3.61 |
| 1,310.0 | 0.95 | 252.47 | 1,310.0 | 319.0 | -0.1 | -5.0 | -2.0 | 0.10 | 0.10 | 1.02 |
| 1,410.0 | 0.96 | 257.42 | 1,410.0 | 419.0 | -0.6 | -6.7 | -2.3 | 0.08 | 0.01 | 4.95 |
| 1,510.0 | 0.97 | 257.58 | 1,509.9 | 518.9 | -0.9 | -8.3 | -2.7 | 0.01 | 0.01 | 0.16 |
| 1,610.0 | 0.90 | 258.19 | 1,609.9 | 618.9 | -1.3 | -9.9 | -3.0 | 0.07 | -0.07 | 0.61 |
| 1,710.0 | 0.91 | 258.48 | 1,709.9 | 718.9 | -1.6 | -11.4 | -3.4 | 0.01 | 0.01 | 0.29 |
| 1,810.0 | 0.74 | 248.02 | 1,809.9 | 818.9 | -2.0 | -12.8 | -3.6 | 0.23 | -0.17 | -10.46 |
| 1,910.0 | 0.74 | 244.50 | 1,909.9 | 918.9 | -2.5 | -14.0 | -3.7 | 0.05 | 0.00 | -3.52 |
| 2,010.0 | 0.71 | 242.90 | 2,009.9 | 1,018.9 | -3.1 | -15.1 | -3.6 | 0.04 | -0.03 | -1.60 |
| 2,110.0 | 0.65 | 241.55 | 2,109.9 | 1,118.9 | -3.6 | -16.2 | -3.6 | 0.06 | -0.06 | -1.35 |
| 2,210.0 | 0.67 | 240.43 | 2,209.9 | 1,218.9 | -4.2 | -17.2 | -3.5 | 0.02 | 0.02 | -1.12 |
| 2,310.0 | 0.63 | 238.53 | 2,309.9 | 1,318.9 | -4.7 | -18.2 | -3.4 | 0.05 | -0.04 | -1.90 |
| 2,410.0 | 0.59 | 240.00 | 2,409.9 | 1,418.9 | -5.3 | -19.1 | -3.3 | 0.04 | -0.04 | 1.47 |
| 2,510.0 | 0.59 | 240.69 | 2,509.9 | 1,518.9 | -5.8 | -20.0 | -3.2 | 0.01 | 0.00 | 0.69 |
| 2,610.0 | 0.52 | 232.09 | 2,609.8 | 1,618.8 | -6.3 | -20.8 | -3.0 | 0.11 | -0.07 | -8.60 |
| 2,710.0 | 0.50 | 235.97 | 2,709.8 | 1,718.8 | -6.9 | -21.5 | -2.9 | 0.04 | -0.02 | 3.88 |
| 2,810.0 | 0.37 | 232.23 | 2,809.8 | 1,818.8 | -7.3 | -22.1 | -2.7 | 0.13 | -0.13 | -3.74 |
| 2,910.0 | 0.31 | 231.12 | 2,909.8 | 1,918.8 | -7.7 | -22.6 | -2.6 | 0.06 | -0.06 | -1.11 |
| 3,010.0 | 0.29 | 229.34 | 3,009.8 | 2,018.8 | -8.0 | -23.0 | -2.5 | 0.02 | -0.02 | -1.78 |
| 3,110.0 | 0.30 | 226.03 | 3,109.8 | 2,118.8 | -8.3 | -23.4 | -2.3 | 0.02 | 0.01 | -3.31 |
| 3,210.0 | 0.29 | 221.71 | 3,209.8 | 2,218.8 | -8.7 | -23.7 | -2.1 | 0.02 | -0.01 | -4.32 |
| 3,310.0 | 0.33 | 226.23 | 3,309.8 | 2,318.8 | -9.1 | -24.1 | -1.9 | 0.05 | 0.04 | 4.52 |
| 3,410.0 | 0.33 | 228.47 | 3,409.8 | 2,418.8 | -9.5 | -24.5 | -1.8 | 0.01 | 0.00 | 2.24 |
| 3,510.0 | 0.32 | 234.78 | 3,509.8 | 2,518.8 | -9.8 | -25.0 | -1.6 | 0.04 | -0.01 | 6.31 |
| 3,610.0 | 0.35 | 250.89 | 3,609.8 | 2,618.8 | -10.1 | -25.5 | -1.6 | 0.10 | 0.03 | 16.11 |
| 3,710.0 | 0.53 | 265.59 | 3,709.8 | 2,718.8 | -10.2 | -26.2 | -1.8 | 0.21 | 0.18 | 14.70 |
| 3,810.0 | 0.64 | 278.76 | 3,809.8 | 2,818.8 | -10.2 | -27.3 | -2.3 | 0.17 | 0.11 | 13.17 |
| 3,910.0 | 0.87 | 281.35 | 3,909.8 | 2,918.8 | -10.0 | -28.5 | -3.0 | 0.23 | 0.23 | 2.59 |
| 4,010.0 | 1.15 | 282.93 | 4,009.8 | 3,018.8 | -9.6 | -30.3 | -4.1 | 0.28 | 0.28 | 1.58 |
| 4,110.0 | 1.45 | 287.52 | 4,109.8 | 3,118.8 | -9.0 | -32.5 | -5.6 | 0.32 | 0.30 | 4.59 |
| 4,210.0 | 1.67 | 288.93 | 4,209.7 | 3,218.7 | -8.1 | -35.0 | -7.4 | 0.22 | 0.22 | 1.41 |
| 4,310.0 | 1.90 | 292.82 | 4,309.7 | 3,318.7 | -7.0 | -37.9 | -9.7 | 0.26 | 0.23 | 3.89 |
| 4,410.0 | 2.04 | 297.14 | 4,409.6 | 3,418.6 | -5.6 | -41.1 | -12.3 | 0.20 | 0.14 | 4.32 |
| 4,510.0 | 2.25 | 301.27 | 4,509.6 | 3,518.6 | -3.7 | -44.3 | -15.4 | 0.26 | 0.21 | 4.13 |
| 4,610.0 | 2.35 | 302.77 | 4,609.5 | 3,618.5 | -1.6 | -47.7 | -18.7 | 0.12 | 0.10 | 1.50 |
| 4,710.0 | 2.44 | 309.00 | 4,709.4 | 3,718.4 | 0.9 | -51.1 | -22.4 | 0.28 | 0.09 | 6.23 |
| 4,810.0 | 2.72 | 310.48 | 4,809.3 | 3,818.3 | 3.7 | -54.6 | -26.4 | 0.29 | 0.28 | 1.48 |
| 4,910.0 | 3.10 | 309.19 | 4,909.2 | 3,918.2 | 7.0 | -58.5 | -31.0 | 0.39 | 0.38 | -1.29 |

Phoenix Technologies

Survey Report

| | | | |
|------------------|---------------------------|-------------------------------------|----------------------------|
| Database: | EDM 5000.1 Single User Db | Local Co-ordinate Reference: | Site D= Dodd County 513145 |
| Company: | EQT Production - Marcolis | TVD Reference: | KB@23ft @ 991.0usft |
| Project: | Doddridge County, WV Grad | MD Reference: | KB@23ft @ 991.0usft |
| Site: | Doddridge County 513145 | North Reference: | Grid |
| Well: | Well #513145 | Survey Calculation Method: | Minimum Curvature |
| Wellbore: | Main Wellbore | | |
| Design: | 513145 As Drilled Surveys | | |

Survey

| Measured Depth (usft) | Inclination (°) | Azimuth (°) | Vertical Depth (usft) | Subsea Depth (usft) | +N/-S (usft) | +E/-W (usft) | Vertical Section (usft) | Dogleg Rate (°/100usft) | Build Rate (°/100usft) | Turn Rate (°/100usft) |
|-----------------------|-----------------|-------------|-----------------------|---------------------|--------------|--------------|-------------------------|-------------------------|------------------------|-----------------------|
| Curve Data=4991' MD | | | | | | | | | | |
| 4,991.0 | 3.41 | 311.83 | 4,990.0 | 3,999.0 | 10.0 | -62.0 | -35.2 | 0.43 | 0.38 | 3.26 |
| 5,000.0 | 3.41 | 311.83 | 4,999.0 | 4,008.0 | 10.3 | -62.4 | -35.7 | 0.00 | 0.00 | 0.00 |
| 5,042.0 | 3.80 | 303.70 | 5,040.9 | 4,049.9 | 12.0 | -64.4 | -38.1 | 1.04 | 0.93 | -7.45 |
| 5,073.0 | 3.80 | 316.00 | 5,071.9 | 4,080.9 | 13.4 | -65.9 | -40.0 | 1.56 | 0.00 | 23.55 |
| 5,105.0 | 5.60 | 322.80 | 5,103.8 | 4,112.8 | 15.4 | -67.6 | -42.5 | 5.88 | 5.63 | 21.25 |
| 5,136.0 | 8.80 | 330.40 | 5,134.5 | 4,143.5 | 18.7 | -69.6 | -46.4 | 10.75 | 10.32 | 24.52 |
| 5,168.0 | 11.60 | 333.10 | 5,166.0 | 4,175.0 | 23.7 | -72.3 | -52.0 | 8.87 | 8.75 | 8.44 |
| 5,199.0 | 14.60 | 333.70 | 5,196.2 | 4,205.2 | 30.0 | -75.5 | -59.1 | 9.69 | 9.68 | 1.94 |
| 5,231.0 | 18.00 | 336.70 | 5,226.9 | 4,235.9 | 38.1 | -79.2 | -68.0 | 10.94 | 10.63 | 9.38 |
| 5,262.0 | 21.30 | 340.40 | 5,256.1 | 4,265.1 | 47.8 | -83.0 | -78.4 | 11.37 | 10.65 | 11.94 |
| 5,294.0 | 24.80 | 344.90 | 5,285.5 | 4,294.5 | 59.8 | -86.7 | -90.8 | 12.24 | 10.94 | 14.06 |
| 5,325.0 | 27.50 | 350.00 | 5,313.4 | 4,322.4 | 73.1 | -89.6 | -104.2 | 11.33 | 8.71 | 16.45 |
| 5,357.0 | 28.50 | 353.80 | 5,341.6 | 4,350.6 | 88.0 | -91.7 | -118.5 | 6.39 | 3.13 | 11.88 |
| 5,388.0 | 30.50 | 354.20 | 5,368.6 | 4,377.6 | 103.2 | -93.3 | -132.9 | 6.48 | 6.45 | 1.29 |
| 5,420.0 | 33.60 | 351.70 | 5,395.7 | 4,404.7 | 120.0 | -95.4 | -149.1 | 10.54 | 9.69 | -7.81 |
| 5,451.0 | 35.00 | 350.40 | 5,421.3 | 4,430.3 | 137.3 | -98.1 | -165.9 | 5.10 | 4.52 | -4.19 |
| 5,482.0 | 32.90 | 351.30 | 5,447.0 | 4,456.0 | 154.4 | -100.9 | -182.5 | 6.97 | -6.77 | 2.90 |
| 5,514.0 | 29.00 | 354.50 | 5,474.5 | 4,483.5 | 170.7 | -103.0 | -198.2 | 13.22 | -12.19 | 10.00 |
| 5,545.0 | 25.70 | 358.10 | 5,502.0 | 4,511.0 | 184.9 | -103.9 | -211.5 | 11.90 | -10.65 | 11.61 |
| 5,577.0 | 21.80 | 1.40 | 5,531.3 | 4,540.3 | 197.8 | -104.0 | -223.2 | 12.87 | -12.19 | 10.31 |
| 5,609.0 | 17.10 | 0.90 | 5,561.5 | 4,570.5 | 208.4 | -103.8 | -232.7 | 14.70 | -14.69 | -1.56 |
| 5,640.0 | 13.50 | 356.50 | 5,591.4 | 4,600.4 | 216.6 | -103.9 | -240.2 | 12.19 | -11.61 | -14.19 |
| 5,671.0 | 10.10 | 352.30 | 5,621.7 | 4,630.7 | 222.9 | -104.5 | -246.2 | 11.31 | -10.97 | -13.55 |
| 5,703.0 | 6.90 | 355.10 | 5,653.3 | 4,662.3 | 227.6 | -105.0 | -250.7 | 10.08 | -10.00 | 8.75 |
| 5,734.0 | 4.50 | 359.70 | 5,684.2 | 4,693.2 | 230.7 | -105.2 | -253.5 | 7.87 | -7.74 | 14.84 |
| 5,766.0 | 1.80 | 345.40 | 5,716.1 | 4,725.1 | 232.4 | -105.3 | -255.2 | 8.72 | -8.44 | -44.69 |
| 5,797.0 | 0.90 | 233.20 | 5,747.1 | 4,756.1 | 232.7 | -105.7 | -255.6 | 7.41 | -2.90 | -361.94 |
| 5,829.0 | 1.30 | 227.90 | 5,779.1 | 4,786.1 | 232.3 | -106.1 | -255.4 | 1.29 | 1.25 | -16.56 |
| 5,860.0 | 2.50 | 171.50 | 5,810.1 | 4,819.1 | 231.4 | -106.3 | -254.7 | 6.72 | 3.87 | -181.94 |
| 5,891.0 | 5.00 | 153.00 | 5,841.0 | 4,850.0 | 229.6 | -105.6 | -252.7 | 8.86 | 8.06 | -59.68 |
| 5,923.0 | 7.90 | 144.60 | 5,872.8 | 4,881.8 | 226.5 | -103.7 | -249.1 | 9.51 | 9.06 | -26.25 |
| 5,954.0 | 11.60 | 146.50 | 5,903.4 | 4,912.4 | 222.2 | -100.7 | -243.9 | 11.98 | 11.94 | 6.13 |
| 5,986.0 | 14.40 | 151.80 | 5,934.6 | 4,943.6 | 216.0 | -97.1 | -236.8 | 9.50 | 8.75 | 16.56 |
| 6,017.0 | 17.60 | 155.30 | 5,964.4 | 4,973.4 | 208.3 | -93.3 | -228.2 | 10.78 | 10.32 | 11.29 |
| 6,049.0 | 20.50 | 154.30 | 5,994.6 | 5,003.6 | 198.9 | -88.8 | -217.8 | 9.12 | 9.06 | -3.13 |
| 6,080.0 | 23.20 | 153.00 | 6,023.4 | 5,032.4 | 188.6 | -83.7 | -206.3 | 8.85 | 8.71 | -4.19 |
| 6,111.0 | 26.20 | 153.20 | 6,051.5 | 5,060.5 | 177.0 | -77.8 | -193.3 | 9.68 | 9.68 | 0.65 |
| 6,143.0 | 29.00 | 156.80 | 6,079.9 | 5,088.9 | 163.6 | -71.6 | -178.5 | 10.18 | 8.75 | 11.25 |
| 6,174.0 | 32.00 | 158.50 | 6,106.6 | 5,115.6 | 149.0 | -65.6 | -162.8 | 10.07 | 9.68 | 5.48 |
| 6,206.0 | 33.50 | 158.10 | 6,133.5 | 5,142.5 | 132.9 | -59.2 | -145.5 | 4.74 | 4.69 | -1.25 |
| 6,237.0 | 36.70 | 157.20 | 6,158.9 | 5,167.9 | 116.5 | -52.4 | -127.7 | 10.46 | 10.32 | -2.90 |
| 6,269.0 | 39.70 | 155.40 | 6,184.0 | 5,193.0 | 98.3 | -44.5 | -107.9 | 10.00 | 9.38 | -5.63 |

Phoenix Technologies
Survey Report

| | | | |
|------------------|----------------------------|-------------------------------------|------------------------------|
| Database: | EDM 5000.1 Single User Db | Local Co-ordinate Reference: | Site Doddridge County 513145 |
| Company: | EQT Production - Marcellus | TVD Reference: | KB@23ft @ 991 0usft |
| Project: | Doddridge County, WV Gnd | MD Reference: | KB@23ft @ 991 0usft |
| Site: | Doddridge County 513145 | North Reference: | Grid |
| Well: | Well #513145 | Survey Calculation Method: | Minimum Curvature |
| Wellbore: | Mian Wellbore | | |
| Design: | 513145 As Drilled Surveys | | |

Survey

| Measured Depth (usft) | Inclination (°) | Azimuth (°) | Vertical Depth (usft) | Subsea Depth (usft) | +N/-S (usft) | +E/-W (usft) | Vertical Section (usft) | Dogleg Rate (°/100usft) | Build Rate (°/100usft) | Turn Rate (°/100usft) |
|--------------------------------|-----------------|-------------|-----------------------|---------------------|--------------|--------------|-------------------------|-------------------------|------------------------|-----------------------|
| 6,300.0 | 42.80 | 153.90 | 6,207.3 | 5,216.3 | 79.9 | -35.7 | -87.5 | 10.50 | 10.00 | -4.84 |
| 6,332.0 | 46.00 | 153.10 | 6,230.2 | 5,239.2 | 59.8 | -25.7 | -65.1 | 10.15 | 10.00 | -2.50 |
| 6,363.0 | 49.00 | 153.50 | 6,251.1 | 5,260.1 | 39.4 | -15.5 | -42.3 | 9.72 | 9.68 | 1.29 |
| 6,395.0 | 51.80 | 154.00 | 6,271.5 | 5,280.5 | 17.3 | -4.6 | -17.6 | 8.83 | 8.75 | 1.56 |
| 6,426.0 | 54.30 | 156.00 | 6,290.2 | 5,299.2 | -5.1 | 5.9 | 7.1 | 9.57 | 8.06 | 6.45 |
| 6,458.0 | 57.60 | 157.10 | 6,308.1 | 5,317.1 | -29.5 | 16.4 | 33.6 | 10.70 | 10.31 | 3.44 |
| 6,489.0 | 60.70 | 157.00 | 6,324.0 | 5,333.0 | -54.0 | 26.8 | 60.2 | 10.00 | 10.00 | -0.32 |
| 6,520.0 | 63.70 | 156.40 | 6,338.4 | 5,347.4 | -79.1 | 37.7 | 87.6 | 9.83 | 9.68 | -1.94 |
| 6,552.0 | 66.90 | 155.80 | 6,351.8 | 5,360.8 | -105.7 | 49.4 | 116.7 | 10.14 | 10.00 | -1.88 |
| 6,583.0 | 69.10 | 156.10 | 6,363.4 | 5,372.4 | -132.0 | 61.2 | 145.4 | 7.15 | 7.10 | 0.97 |
| 6,615.0 | 71.70 | 156.10 | 6,374.1 | 5,383.1 | -159.5 | 73.4 | 175.6 | 8.13 | 8.13 | 0.00 |
| 6,646.0 | 74.00 | 155.80 | 6,383.3 | 5,392.3 | -186.6 | 85.4 | 205.2 | 7.48 | 7.42 | -0.97 |
| 6,678.0 | 76.90 | 155.80 | 6,391.3 | 5,400.3 | -214.8 | 98.1 | 236.2 | 9.06 | 9.06 | 0.00 |
| 6,709.0 | 80.30 | 155.00 | 6,397.4 | 5,406.4 | -242.4 | 110.8 | 266.6 | 11.26 | 10.97 | -2.58 |
| 6,741.0 | 83.30 | 154.50 | 6,402.0 | 5,411.0 | -271.1 | 124.3 | 298.2 | 9.50 | 9.38 | -1.56 |
| 6,772.0 | 86.20 | 153.40 | 6,404.8 | 5,413.8 | -298.8 | 137.9 | 329.1 | 10.00 | 9.35 | -3.55 |
| 6,867.0 | 91.30 | 155.70 | 6,406.9 | 5,415.9 | -384.5 | 178.7 | 424.0 | 5.89 | 5.37 | 2.42 |
| 6,961.0 | 89.40 | 156.30 | 6,406.3 | 5,415.3 | -470.4 | 216.9 | 518.0 | 2.12 | -2.02 | 0.64 |
| 7,055.0 | 89.90 | 155.20 | 6,406.9 | 5,415.9 | -556.1 | 255.5 | 612.0 | 1.29 | 0.53 | -1.17 |
| 7,150.0 | 89.80 | 153.10 | 6,407.2 | 5,416.2 | -641.6 | 296.9 | 707.0 | 2.21 | -0.11 | -2.21 |
| 7,244.0 | 90.70 | 152.20 | 6,406.8 | 5,415.8 | -725.1 | 340.1 | 800.9 | 1.35 | 0.96 | -0.96 |
| 7,338.0 | 91.60 | 154.70 | 6,404.9 | 5,413.9 | -809.2 | 382.1 | 894.8 | 2.83 | 0.96 | 2.66 |
| 7,401.0 | 89.70 | 155.00 | 6,404.2 | 5,413.2 | -866.2 | 408.9 | 957.8 | 3.05 | -3.02 | 0.48 |
| 7,433.0 | 89.30 | 154.60 | 6,404.4 | 5,413.4 | -895.1 | 422.5 | 989.8 | 1.77 | -1.25 | -1.25 |
| 7,495.0 | 89.20 | 156.30 | 6,405.2 | 5,414.2 | -951.5 | 448.2 | 1,051.8 | 2.75 | -0.16 | 2.74 |
| 7,528.0 | 89.20 | 157.50 | 6,405.7 | 5,414.7 | -981.9 | 461.2 | 1,084.8 | 3.64 | 0.00 | 3.64 |
| 7,591.0 | 84.00 | 158.20 | 6,409.4 | 5,418.4 | -1,040.1 | 484.9 | 1,147.6 | 8.33 | -8.25 | 1.11 |
| 7,622.0 | 84.20 | 158.60 | 6,412.6 | 5,421.6 | -1,068.8 | 496.2 | 1,178.4 | 1.44 | 0.65 | 1.29 |
| LP= 7718' MB/G-418' TVD | | | | | | | | | | |
| 7,716.0 | 89.10 | 157.40 | 6,418.1 | 5,427.1 | -1,155.7 | 531.4 | 1,272.0 | 5.37 | 5.21 | -1.28 |
| 7,811.0 | 90.40 | 157.40 | 6,418.5 | 5,427.5 | -1,243.4 | 567.9 | 1,367.0 | 1.37 | 1.37 | 0.00 |
| 7,905.0 | 87.70 | 156.60 | 6,420.1 | 5,429.1 | -1,330.0 | 604.6 | 1,460.9 | 3.00 | -2.87 | -0.85 |
| 8,000.0 | 88.80 | 156.70 | 6,423.0 | 5,432.0 | -1,417.1 | 642.3 | 1,555.8 | 1.16 | 1.16 | 0.11 |
| 8,095.0 | 89.00 | 155.40 | 6,424.8 | 5,433.8 | -1,503.9 | 680.8 | 1,650.8 | 1.38 | 0.21 | -1.37 |
| 8,189.0 | 89.10 | 153.20 | 6,426.4 | 5,435.4 | -1,588.6 | 721.6 | 1,744.7 | 2.34 | 0.11 | -2.34 |
| 8,283.0 | 88.90 | 151.80 | 6,428.0 | 5,437.0 | -1,672.0 | 765.0 | 1,838.6 | 1.50 | -0.21 | -1.49 |
| 8,378.0 | 88.80 | 149.70 | 6,429.9 | 5,438.9 | -1,754.9 | 811.4 | 1,933.3 | 2.21 | -0.11 | -2.21 |
| 8,472.0 | 89.40 | 152.50 | 6,431.4 | 5,440.4 | -1,837.1 | 856.8 | 2,027.1 | 3.05 | 0.64 | 2.98 |
| 8,567.0 | 90.40 | 154.90 | 6,431.6 | 5,440.6 | -1,922.3 | 898.9 | 2,122.1 | 2.74 | 1.05 | 2.53 |
| 8,661.0 | 89.20 | 156.10 | 6,431.9 | 5,440.9 | -2,007.8 | 937.9 | 2,216.1 | 1.81 | -1.28 | 1.28 |
| 8,755.0 | 88.20 | 152.40 | 6,434.0 | 5,443.0 | -2,092.4 | 978.7 | 2,310.0 | 4.08 | -1.06 | -3.94 |
| 8,849.0 | 89.10 | 154.00 | 6,436.2 | 5,445.2 | -2,176.3 | 1,021.0 | 2,403.9 | 1.95 | 0.96 | 1.70 |
| 8,943.0 | 88.80 | 152.20 | 6,438.0 | 5,447.0 | -2,260.1 | 1,063.6 | 2,497.9 | 1.94 | -0.32 | -1.91 |

Phoenix Technologies

Survey Report

| | | |
|--|--|---|
| Database: EDM 51145 1 Single User Db Company: EQT Production - Marcellus Project: Doddridge County WV Grid Site: Doddridge County 513145 Well: Well #513145 Wellbore: Main Wellbore Design: 513145 As Drilled Surveys | Local Co-ordinate Reference: TVD Reference: MD Reference: North Reference: Survey Calculation Method: | Site Doddridge County 513145 KB = 23ft @ 991.0usft KD = 23ft @ 991.0usft Grid Minimum Curvature |
|--|--|---|

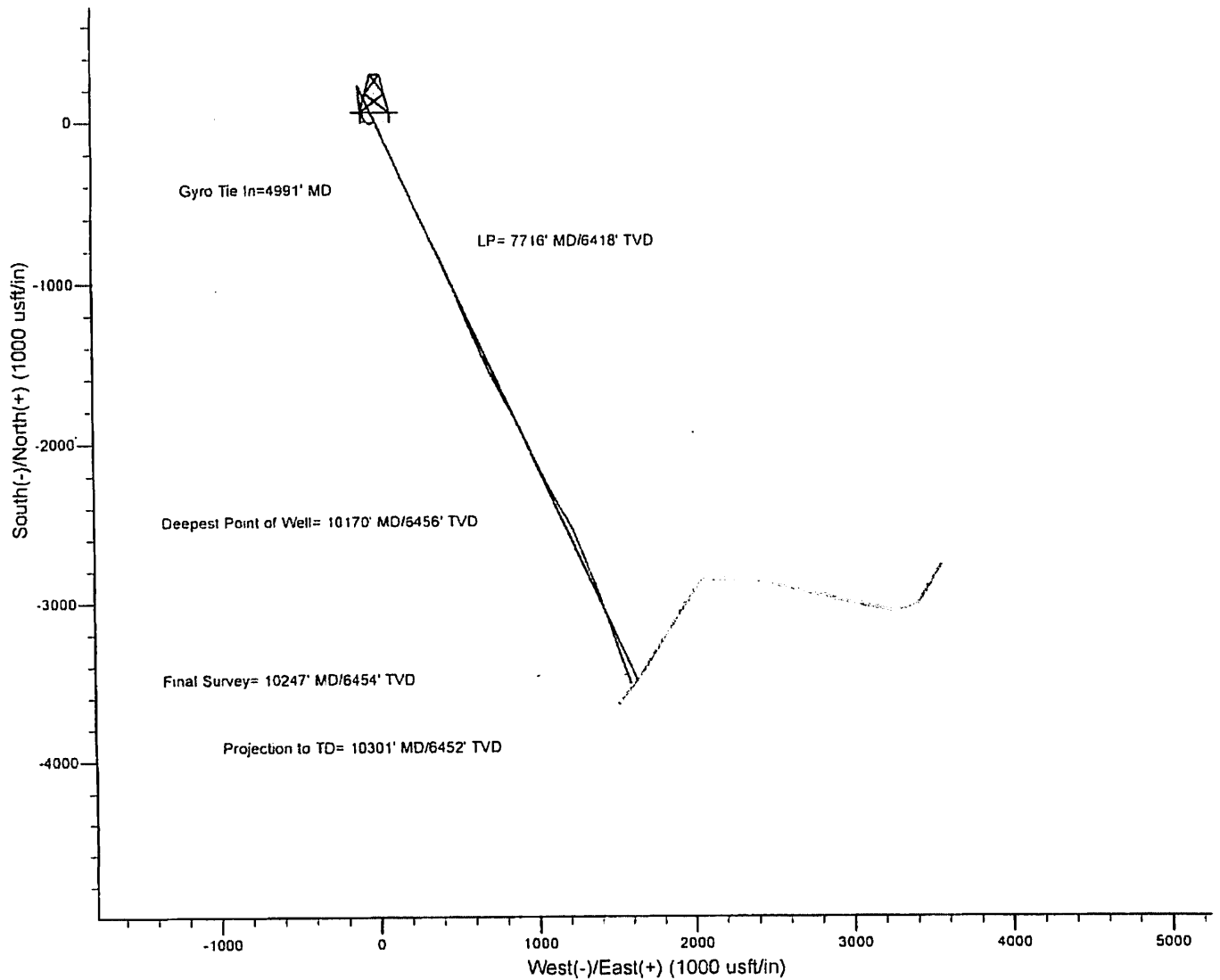
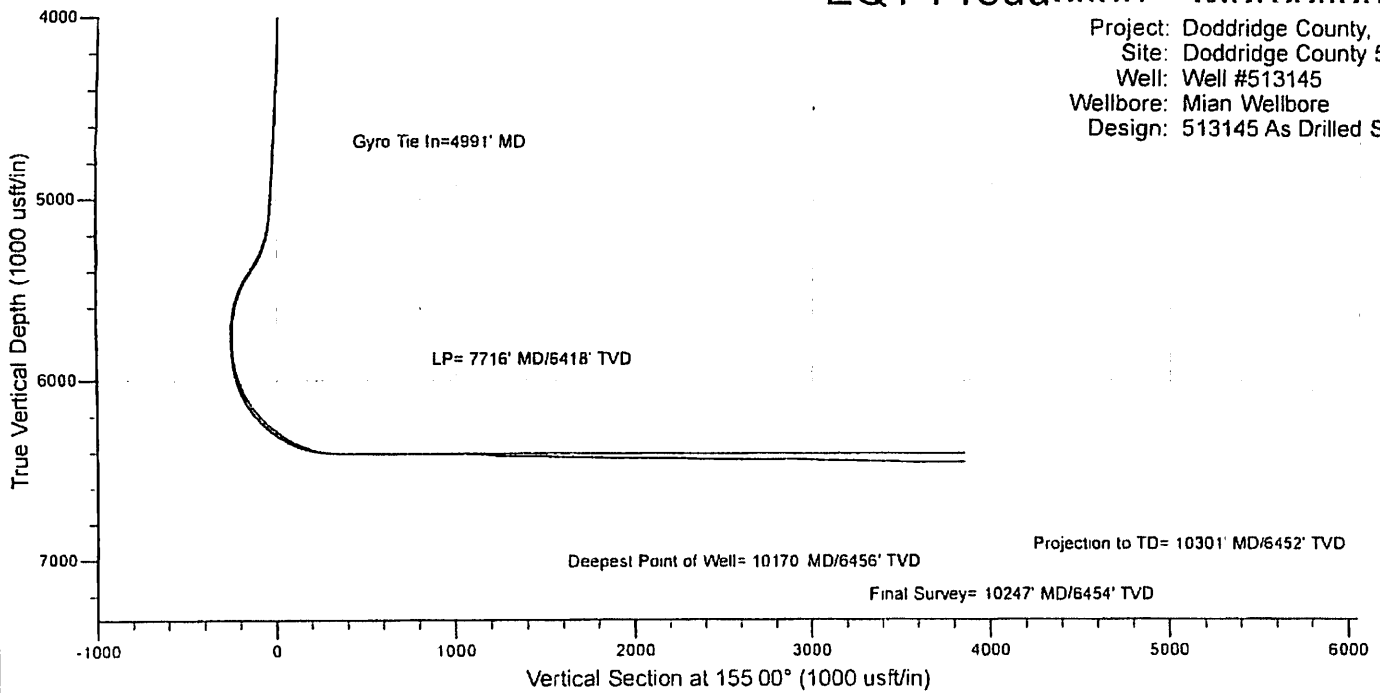
| Measured Depth (usft) | Inclination (°) | Azimuth (°) | Vertical Depth (usft) | Subsea Depth (usft) | +N/-S (usft) | +E/-W (usft) | Vertical Section (usft) | Dogleg Rate (°/100usft) | Build Rate (°/100usft) | Turn Rate (°/100usft) |
|--|-----------------|-------------|-----------------------|---------------------|--------------|--------------|-------------------------|-------------------------|------------------------|-----------------------|
| 9 037 0 | 89 40 | 150 00 | 6 439 4 | 5 448 4 | -2,342 4 | 1,109 0 | 2,591 6 | 2 43 | 0 64 | -2 34 |
| 9,131 0 | 90 50 | 148 00 | 6,439 5 | 5,448 5 | -2,423 0 | 1,157 4 | 2,685 1 | 2 43 | 1 17 | -2 13 |
| 9,226 0 | 91 70 | 152 60 | 6,437 7 | 5,446 7 | -2,505 5 | 1,204 4 | 2,779 7 | 5 00 | 1 26 | 4 84 |
| 9,320 0 | 89 80 | 156 50 | 6,436 5 | 5,445 5 | -2 590 3 | 1 244 8 | 2 873 7 | 4 61 | -2 02 | 4 15 |
| 9 415 0 | 87 80 | 158 80 | 6 438 5 | 5 447 5 | -2 678 1 | 1 280 9 | 2 968 6 | 3 21 | -2 11 | 2 42 |
| 9,509 0 | 88 60 | 158 30 | 6 441 4 | 5 450 4 | -2 765 6 | 1 315 3 | 3 062 3 | 1 00 | 0 85 | -0 53 |
| 9,604 0 | 87 40 | 157 90 | 6 444 7 | 5 453 7 | -2 853 7 | 1 350 7 | 3 157 1 | 1 33 | -1 26 | -0 42 |
| 9,698 0 | 90 40 | 160 10 | 6 446 5 | 5 455 5 | -2 941 4 | 1 384 4 | 3 250 9 | 3 96 | 3 19 | 2 34 |
| 9,792 0 | 88 00 | 160 70 | 6 447 8 | 5 456 8 | -3 029 9 | 1 415 9 | 3 344 4 | 2 63 | -2 55 | 0 64 |
| 9,886 0 | 88 50 | 159 10 | 6 450 7 | 5 459 7 | -3 118 2 | 1 448 2 | 3 438 1 | 1 78 | 0 53 | -1 70 |
| 9,980 0 | 88 50 | 162 60 | 6 453 2 | 5 462 2 | -3 206 9 | 1 479 0 | 3 531 5 | 3 72 | 0 00 | 3 72 |
| 10,075 0 | 88 70 | 160 10 | 6,455 5 | 5 464 5 | -3 296 9 | 1 509 4 | 3 625 9 | 2 64 | 0 21 | -2 63 |
| Deepest Point of Well= 10170' MD/6418' TVD | | | | | | | | | | |
| 10,170 0 | 90 90 | 160 50 | 6,455 8 | 5 464 8 | -3 386 3 | 1 541 4 | 3 720 5 | 2 35 | 2 32 | 0 42 |
| Final Survey= 10247' MD/6456' TVD | | | | | | | | | | |
| 10,247 0 | 91 80 | 159 80 | 6 454 0 | 5 463 0 | 3 458 7 | 1 567 5 | 3 797 2 | 1 48 | 1 17 | -0 91 |
| Projection= 10301' MD/6452' TVD | | | | | | | | | | |
| 10 301 0 | 91 80 | 159 80 | 6,452 3 | | | 1,586 2 | 3 850 9 | 0 00 | 0 00 | 0 00 |

| Measured Depth (usft) | Vertical Depth (usft) | Local Coordinates | | Comment |
|-----------------------|-----------------------|-------------------|--------------|--|
| | | +N/-S (usft) | +E/-W (usft) | |
| 4,991 0 | 4,980 0 | 10 0 | -62 0 | Gyro Tie In=4991' MD |
| 7,716 0 | 6 418 1 | -1,155 7 | 531 4 | LP= 7716' MD/6418' TVD |
| 10 170 0 | 6 455 8 | -3,386 3 | 1,541 4 | Deepest Point of Well= 10170' MD/6456' TVD |
| 10,247 0 | 6,454 0 | -3,458 7 | 1,567 5 | Final Survey= 10247' MD/6456' TVD |
| 10 301 0 | 6 452 3 | -3,509 4 | 1,586 2 | Projection= 10301' MD/6452' TVD |

Checked By _____ Approved By: _____ Date: _____

EQT Production - Marcellus

Project: Doddridge County, WV Grid
Site: Doddridge County 513145
Well: Well #513145
Wellbore: Mian Wellbore
Design: 513145 As Drilled Surveys



Hydraulic Fracturing Fluid Product Component Information Disclosure

| | |
|--------------------------------|--------------------|
| Job Start Date: | 5/5/2015 |
| Job End Date: | 5/6/2015 |
| State: | West Virginia |
| County: | Doddridge |
| API Number: | 47-017-06459-00-00 |
| Operator Name: | EQT Production |
| Well Name and Number: | 513145 |
| Longitude: | -80.76637600 |
| Latitude: | 39.23605500 |
| Datum: | NAD83 |
| Federal/Tribal Well: | NO |
| True Vertical Depth: | 6,365 |
| Total Base Water Volume (gal): | 5,937,498 |
| 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 | Keane Group | Carrier/Base Fluid | Water | 7732-18-5 | 100.00000 | 89.31220 | None |
| Sand (Proppant) | Keane Group | Proppant | Silica Substrate | 14808-60-7 | 100.00000 | 10.33650 | None |
| MC MX 437-5 | Multi-Chem | Calcium nitrate solution | Calcium nitrate | 10124-37-5 | 60.00000 | 0.05723 | None |
| Hydrochloric Acid (15%) | Keane Group | Acidizing | Hydrochloric Acid | 7647-01-0 | 15.00000 | 0.02075 | None |
| FFR 760 | Keane Group | Friction reducer | Hydrotreated Light Distillate | 64742-47-8 | 30.00000 | 0.00935 | None |
| | | | Alkyl Alcohol | Proprietary | 10.00000 | 0.00312 | None |
| | | | Oxyalkylated alcohol A | Proprietary | 5.00000 | 0.00156 | None |
| FFR 730 | Keane Group | Friction reducer | Oxyalkylated alcohol A | Proprietary | 5.00000 | 0.00303 | None |
| EC6330A | Keane Group | Scale Inhibitor | Sodium Phosphate, Tribasic | 7601-54-9 | 5.00000 | 0.00126 | None |
| AI 600 | Keane Group | Corrosion Inhibitor | Ethylene Glycol | 107-21-1 | 40.00000 | 0.00014 | None |

| | | | | | | | |
|--------|-------------|-------------|--|-------------|----------|---------|------|
| | | | N, N-Dimethylformamide | 68-12-2 | 20.00000 | 0.00007 | None |
| | | | Cinnamialdehyde | 104-55-2 | 15.00000 | 0.00005 | None |
| | | | 2-Butoxyethanol | 111-76-2 | 15.00000 | 0.00005 | None |
| | | | Tar bases, quinoline derivs, benzyl chloride-quaternized | 72480-70-7 | 15.00000 | 0.00005 | None |
| | | | 1-Decanol | 112-30-1 | 5.00000 | 0.00002 | None |
| | | | Poly (oxy-1,2-ethanediyl), alpha-(4-nonylphenyl)-omega- hydroxy-, branched | 127087-87-0 | 5.00000 | 0.00002 | None |
| | | | Triethyl Phosphate | 78-40-0 | 2.50000 | 0.00001 | None |
| | | | 1-Octanol | 111-87-5 | 2.50000 | 0.00001 | None |
| | | | Isopropyl alcohol | 67-63-0 | 2.50000 | 0.00001 | None |
| EB-10X | Keane Group | Gel Breaker | | | | | |
| | | | Ethylene Glycol | 107-21-1 | 30.00000 | 0.00008 | None |

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)

Welcome Michelle N., Operator - OpNo. E1210363 [Log Out]

Hydraulic Fracturing
DISCLOSURE



FIND A WELL
BY STATE

ABOUT PROJECT
PARTNERS

(Note: Clicking the FracFocus, FIND A WELL links will open a new window.)

Prepare Disclosure for FracFocus Submission

[Disclosure Lists](#) | [Dashboard](#)

i Disclosure has been submitted.

Note: This window expires with 10 minutes of inactivity. After that you will be taken back to the dashboard.

Hydraulic Fracturing Data

| | | | |
|---------------------------------------|-------------------------------------|----------------------------------|--|
| Job Start Date 5/5/2015 | Job End Date 5/6/2015 | API Number 47-017-06459-00-00 | State & County West Virginia --- Doddridge |
| Well Name 513145 | | | |
| Longitude -80.766376 | Latitude 39.236055 | Datum NAD83 | Federal/Tribal Well? |
| True Vertical Depth (ft) 6365.2 | Total Water Vol (gal) 5937498 | Total Non Water Vol 0 | Total Mass (lbs) 55477774 |



MSDS Chemical Ingredients

| | Trade Name | Supplier | Purpose | Ingredients | CAS # | % High Additive | % HF Job | Comments | Ingredient Mass |
|-------------------------------------|-------------------------|-------------|--------------------------|-------------------------------|-------------|-----------------|----------------|----------|-----------------|
| <input type="button" value="Edit"/> | Water | Keane Group | Carrier/Base Fluid | Water | 7732-18-5 | 100% | 89.3122003786% | None | 49548420.81 |
| <input type="button" value="Edit"/> | Sand (Proppant) | Keane Group | Proppant | Silica Substrate | 14808-60-7 | 100% | 10.3364997756% | None | 5734460 |
| <input type="button" value="Edit"/> | MC MX 437-5 | Multi-Chem | Calcium nitrate solution | Calcium nitrate | 10124-37-5 | 60% | .0572256031% | None | 31747.491 |
| <input type="button" value="Edit"/> | Hydrochloric Acid (15%) | Keane Group | Acidizing | Hydrochloric Acid | 7647-01-0 | 15% | .0207545158% | None | 11514.143 |
| <input type="button" value="Edit"/> | FFR 760 | Keane Group | Friction reducer | Hydrotreated Light Distillate | 64742-47-8 | 30% | .0093505505% | None | 5187.477 |
| | | | | Atkyl Alcohol | Proprietary | 10% | .0031168502% | None | 1729.159 |
| | | | | Oxyalkylated alcohol A | Proprietary | 5% | .0015584251% | None | 864.58 |
| <input type="button" value="Edit"/> | FFR 730 | Keane Group | Friction reducer | Oxyalkylated alcohol A | Proprietary | 5% | .0030340587% | None | 1683.228 |
| <input type="button" value="Edit"/> | EC6330A | Keane Group | Scale Inhibitor | Sodium Phosphate, Tribasic | 7601-54-9 | 5% | .0012555908% | None | 696.574 |
| <input type="button" value="Edit"/> | AI 600 | | | | | | | | |

| Keane Group | | Corrosion Inhibitor | | | | | | |
|-------------------------------------|---------|---|-------------|------|--------------|------|--|--------|
| | | Ethylene Glycol | 107-21-1 | 40% | .0001384814% | None | | 76.826 |
| | | N, N-Dimethylformamide | 68-12-2 | 20% | .0000692407% | None | | 38.413 |
| | | Cinnamialdehyde | 104-55-2 | 15% | .0000519305% | None | | 28.81 |
| | | 2-Butoxyethanol | 111-76-2 | 15% | .0000519305% | None | | 28.81 |
| | | Tar bases, quinoline derivs, benzyl chloride-quatemized | 72480-70-7 | 15% | .0000519305% | None | | 28.81 |
| | | 1-Decanol | 112-30-1 | 5% | .0000173102% | None | | 9.603 |
| | | Poly (oxy-1,2-ethanediyl), .alpha.-(4-nonylphenyl)-.omega.-hydroxy-, branched | 127087-87-0 | 5% | .0000173102% | None | | 9.603 |
| | | Triethyl Phosphate | 78-40-0 | 2.5% | .0000086551% | None | | 4.802 |
| | | 1-Octanol | 111-87-5 | 2.5% | .0000086551% | None | | 4.802 |
| | | Isopropyl alcohol | 67-63-0 | 2.5% | .0000086551% | None | | 4.802 |
| <input type="button" value="Edit"/> | LEB-10X | Keane Group | Gel Breaker | | | | | |
| | | Ethylene Glycol | 107-21-1 | 30% | .000075812% | None | | 42.059 |

Non-MSDS Chemical Ingredients

| Trade Name | Supplier | Purpose | Ingredients | CAS # | % High Additive | % HF Job | Comments | Ingredient Mass |
|------------|----------|---------|-------------|-------|-----------------|----------|----------|-----------------|
|------------|----------|---------|-------------|-------|-----------------|----------|----------|-----------------|

Use Terms | © Copyright GWPC & IOGCC, 2010

****CELLS WITH BLUE BACKGROUND ARE THE ONLY CELLS TO BE EDITED****

| | |
|----------------------------------|--------------------|
| Fracture Start Date/Time: | 5/5/15 18:17 |
| Fracture End Date/Time: | 5/6/15 20:38 |
| State: | West Virginia |
| County: | Doddridge |
| API Number: | 47-017-06459-00-00 |
| Operator Number: | E1210363 |
| Well Name: | 513145 |
| Federal Well: | No |
| Longitude: | -80.766376 |
| Latitude: | 39.236055 |
| Long/Lat Projection: | NAD83 |
| True Vertical Depth (TVD): | 6365' |
| Total Clean Fluid Volume* (gal): | 5,937,498 |



| Additive | Specific Gravity | Additive Quantity | Mass (lbs) |
|-------------------------|------------------|-------------------|------------|
| Water | 1.00 | 5,937,498 | 49,548,421 |
| Sand (Proppant) | 2.65 | 5,734,460 | 5,734,460 |
| Hydrochloric Acid (15%) | 1.07 | 8,597 | 76,761 |
| AI 600 | 1.07 | 22 | 192 |
| LBB-10X | 1.20 | 14 | 140 |
| EC6330A | 1.11 | 1,504 | 13,931 |
| MC MX 437-5 | 1.33 | 4,758 | 52,912 |
| FPR 730 | 1.05 | 3,842 | 33,665 |
| FPR 760 | 1.09 | 1,901 | 17,292 |

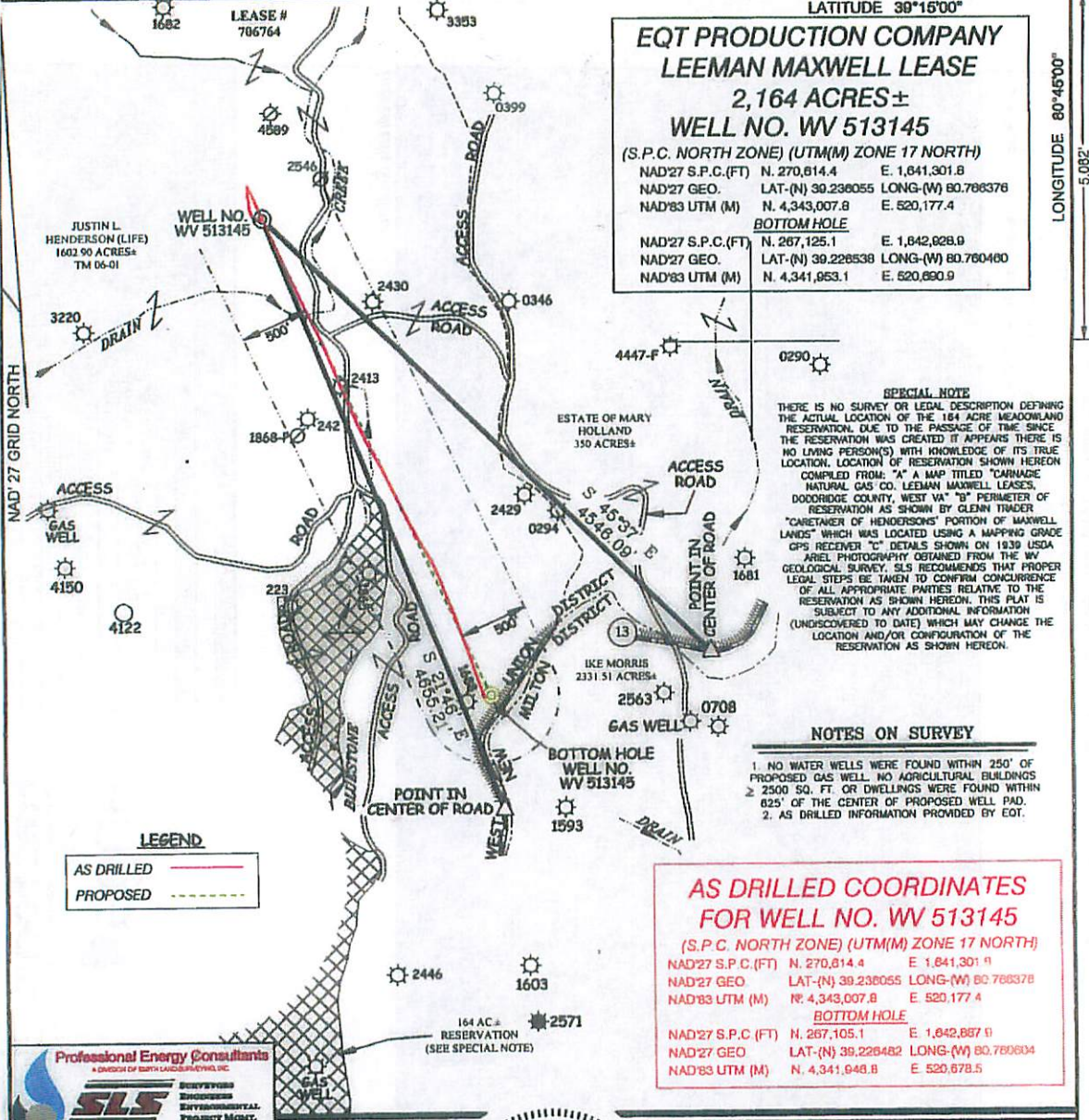
Total Slurry Mass (Lbs)
55,477,774

Ingredients Section:

| Trade Name | Supplier | Purpose | Ingredients | Chemical Abstract Service Number (CAS #) | Maximum Ingredient Concentration in Additive (% by mass)** | Mass per Component (LBS) | Maximum Ingredient Concentration in IIF Fluid (% by mass)** |
|-------------------------|-------------|--------------------------|--|--|--|--------------------------|---|
| Water | Keane Group | Carrier/Base Fluid | Water | 7732-18-5 | 100.00% | 49,548,421 | 89.31220% |
| Sand (Proppant) | Keane Group | Proppant | Silica Substrate | 14808-60-7 | 100.00% | 5,734,460 | 10.33650% |
| Hydrochloric Acid (15%) | Keane Group | Acidizing | Hydrochloric Acid | 7647-01-0 | 15.00% | 11,514 | 0.02075% |
| LBB-10X | Keane Group | Gel Breaker | Ethylene Glycol | 107-21-1 | 30.00% | 42 | 0.00008% |
| EC6330A | Keane Group | Scale Inhibitor | Sodium Phosphate, Tribasic | 7601-54-9 | 5.00% | 697 | 0.00126% |
| AI 600 | Keane Group | Corrosion Inhibitor | Tar bases, quinoline derivs., benzyl chloride quaternized | 72480-70-7 | 15.00% | 29 | 0.00005% |
| | | | Ethylene Glycol | 107-21-1 | 40.00% | 77 | 0.00014% |
| | | | Cinnamialdehyde | 104-55-2 | 15.00% | 29 | 0.00005% |
| | | | 1-Decanol | 112-30-1 | 5.00% | 10 | 0.00002% |
| | | | 2-Butoxyethanol | 111-76-2 | 15.00% | 29 | 0.00005% |
| | | | Isopropyl alcohol | 67-63-0 | 2.50% | 5 | 0.00001% |
| | | | Triethyl Phosphate | 78-40-0 | 2.50% | 5 | 0.00001% |
| | | | N, N-Dimethylformamide | 68-12-2 | 20.00% | 38 | 0.00007% |
| | | | 1-Octanol | 111-87-5 | 2.50% | 5 | 0.00001% |
| | | | Poly (oxy-1,2-ethanediyl) -alpha-(4-nonylphenyl)-omega-hydroxy- branched | 127087-87-0 | 5.00% | 10 | 0.00002% |
| MC MX 437-5 | Multi-Chem | Calcium nitrate solution | Calcium nitrate | 10124-37-5 | 60.00% | 31,747 | 0.05723% |
| FPR 730 | Keane Group | Friction reducer | Oxyalkylated alcohol A | Proprietary | 5.00% | 1,683 | 0.00303% |
| FPR 760 | Keane Group | Friction reducer | Hydrotreated Light Distillate | 64742-47-8 | 30.00% | 5,187 | 0.00935% |
| | | | Alkyl Alcohol | Proprietary | 10.00% | 1,729 | 0.00312% |
| | | | Oxyalkylated alcohol A | Proprietary | 5.00% | 865 | 0.00156% |

*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%

All component information listed was obtained from the supplier's Material Safety Data Sheets (MSDS). As such, the Operator is not responsible for inaccurate and/or incomplete information. Any questions regarding the content of the MSDS should be directed to the supplier who provided it. The Occupational Safety and Health Administration's (OSHA) regulations govern the criteria for the disclosure of this information. Please note that Federal Law protects "proprietary", "trade secret", and "confidential business information" and the criteria for how this information is reported on an MSDS is subject to 29 CFR 1910.1200(i) and Appendix D.



**EQT PRODUCTION COMPANY
LEEMAN MAXWELL LEASE
2,164 ACRES ±
WELL NO. WV 513145**
(S.P.C. NORTH ZONE) (UTM(M) ZONE 17 NORTH)
NAD'27 S.P.C.(FT) N. 270,614.4 E. 1,641,301.8
NAD'27 GEO. LAT.(N) 39.238055 LONG.(W) 80.788378
NAD'83 UTM (M) N. 4,343,007.8 E. 520,177.4
BOTTOM HOLE
NAD'27 S.P.C.(FT) N. 267,125.1 E. 1,642,828.9
NAD'27 GEO. LAT.(N) 39.228538 LONG.(W) 80.780480
NAD'83 UTM (M) N. 4,341,953.1 E. 520,690.9

SPECIAL NOTE
THERE IS NO SURVEY OR LEGAL DESCRIPTION DEFINING THE ACTUAL LOCATION OF THE 164 ACRE MEADOWLAND RESERVATION. DUE TO THE PASSAGE OF TIME SINCE THE RESERVATION WAS CREATED IT APPEARS THERE IS NO LIVING PERSON(S) WITH KNOWLEDGE OF ITS TRUE LOCATION. LOCATION OF RESERVATION SHOWN HEREON COMPILED FROM: "A" A MAP TITLED "CARNEGIE NATURAL GAS CO. LEEMAN MAXWELL LEASES, DODDRIE COUNTY, WEST VA" "B" PERIMETER OF RESERVATION AS SHOWN BY GLEN TRACER "CARSTENER OF HENDERSON'S" PORTION OF "MAXWELL LANDS" WHICH WAS LOCATED USING A MAPPING GRADE GPS RECEIVER "C" DETAILS SHOWN ON 1939 USDA ARIEL PHOTOGRAPHY OBTAINED FROM THE WV GEOLOGICAL SURVEY. SLS RECOMMENDS THAT PROPER LEGAL STEPS BE TAKEN TO CONFIRM CONCURRENCE OF ALL APPROPRIATE PARTIES RELATIVE TO THE RESERVATION AS SHOWN HEREON. THIS PLAT IS SUBJECT TO ANY ADDITIONAL INFORMATION (UNDISCOVERED TO DATE) WHICH MAY CHANGE THE LOCATION AND/OR CONFIGURATION OF THE RESERVATION AS SHOWN HEREON.

NOTES ON SURVEY

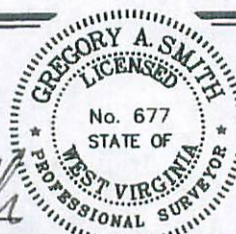
1. NO WATER WELLS WERE FOUND WITHIN 250' OF PROPOSED GAS WELL. NO AGRICULTURAL BUILDINGS ≥ 2500 SQ. FT. OR DWELLINGS WERE FOUND WITHIN 625' OF THE CENTER OF PROPOSED WELL PAD.
2. AS DRILLED INFORMATION PROVIDED BY EQT.

**AS DRILLED COORDINATES
FOR WELL NO. WV 513145**
(S.P.C. NORTH ZONE) (UTM(M) ZONE 17 NORTH)
NAD'27 S.P.C.(FT) N. 270,614.4 E. 1,641,301.8
NAD'27 GEO. LAT.(N) 39.238055 LONG.(W) 80.788378
NAD'83 UTM (M) N. 4,343,007.8 E. 520,177.4
BOTTOM HOLE
NAD'27 S.P.C.(FT) N. 267,105.1 E. 1,642,867.9
NAD'27 GEO. LAT.(N) 39.228482 LONG.(W) 80.780604
NAD'83 UTM (M) N. 4,341,948.8 E. 520,678.5



I THE UNDERSIGNED, HEREBY CERTIFY THAT THIS PLAT IS CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF AND SHOWS ALL THE INFORMATION REQUIRED BY LAW AND THE REGULATIONS ISSUED AND PRESCRIBED BY THE DIVISION OF ENVIRONMENTAL PROTECTION.

P.S. 677 *Gregory A. Smith*



(+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS.
DATE DECEMBER 06, 20 13
REVISED 03/06/14 & 01/12/15
OPERATORS WELL NO. WV 513145
API WELL NO. 47
STATE COUNTY PERMIT

MINIMUM DEGREE OF ACCURACY 1/200 FILE NO. 7889ASDRILLED513145
HORIZONTAL & VERTICAL CONTROL DETERMINED BY DGPS (SURVEY GRADE TIE TO CORS NETWORK) SCALE 1" = 1000'

STATE OF WEST VIRGINIA
DIVISION OF ENVIRONMENTAL PROTECTION
OFFICE OF OIL AND GAS

WELL TYPE: OIL GAS LIQUID INJECTION WASTE DISPOSAL IF "GAS" PRODUCTION STORAGE DEEP SHALLOW

LOCATION: ELEVATION 970'(GROUND) 968'(PROPOSED) WATERSHED BLUESTONE CREEK
DISTRICT WEST UNION COUNTY DODDRIE QUADRANGLE OXFORD 7.5'
SURFACE OWNER JUSTIN L. HENDERSON (LIFE) ACREAGE 1,602.90±
ROYALTY OWNER LEEMAN MAXWELL HRS ACREAGE 2,164±
PROPOSED WORK: LEASE NO. 706764
DRILL CONVERT DRILL DEEPER REDRILL FRACTURE OR STIMULATE PLUG OFF OLD FORMATION PERFORATE NEW FORMATION PLUG AND ABANDON CLEAN OUT AND REPLUG OTHER
PHYSICAL CHANGE IN WELL (SPECIFY) TARGET FORMATION MARCELLUS
ESTIMATED DEPTH 6389'

WELL OPERATOR EQT PRODUCTION COMPANY DESIGNATED AGENT REX C. RAY
ADDRESS 115 PROFESSIONAL PLACE P.O. BOX 280 BRIDGEPORT, WV 26330 ADDRESS 115 PROFESSIONAL PLACE P.O. BOX 280 BRIDGEPORT, WV 26330

COUNTY NAME PERMIT