

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

API 47-095-02212FH6A County Tyler District Centerville  
Quad Shirley Pad Name SHR40HS Field/Pool Name SHR40HS  
Farm Name NOBLE ENERGY, INC. Well Number SHR40DHS - Fracture  
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 4,362,831.426m Easting 514,236.366m  
Landing Point of Curve Northing 4,362,830.954m Easting 514,975.118m  
Bottom Hole Northing 4,360,390.063m Easting 515,911.797m

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Elevation (ft) 771" 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)

Synthetic Oil Based.

Date Permit Issued 08/01/2017 Date drilling commenced 03/25/2015 Date drilling ceased 05/03/2015  
Date completion activities began 08/28/2017 Date completion activities ceased 09/05/2017  
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 357 Open mine(s) (Y/N) depths N  
Salt water depth(s) ft None Noted for Offsets Void(s) encountered (Y/N) depths N  
Coal depth(s) ft N/A Cavern(s) encountered (Y/N) depths N  
Is coal being mined in area (Y/N) N

Reviewed by: AS  
Feb 3/14/2018

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| CASING STRINGS            | Hole Size | Casing Size | Depth    | New or Used | Grade wt/ft           | Basket Depth(s) | Did cement Circulate (Y/N)<br>* Provide details to the right * |
|---------------------------|-----------|-------------|----------|-------------|-----------------------|-----------------|--|
| Conductor                 | 36"       | 20"         | 40'      |             |                       |                 |  |
| Surface                   | 17 1/2"   | 13 3/8"     | 500.4'   | New         | J-55 54.5# / 500.4'   |                 | Y  |
| Coal                      |           |             |          |             |                       |                 |  |
| Intermediate 1            | 13 3/8"   | 9 5/8"      | 2226.6'  | New         | HCK-55 36# / 2226.6'  |                 | Y  |
| Intermediate 2            |           |             |          |             |                       |                 |  |
| Intermediate 3            |           |             |          |             |                       |                 |  |
| Production                | 8 3/4"    | 5 1/2"      | 16127.1' | New         | P-110 20# / 16127.1'  |                 | Y  |
| Tubing                    | 5 1/2"    | 2 3/8"      | 7420.90' | New         | P-110 4.7# / 7420.90' |                 |  |
| 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      |                      |                 |                 |                  |               |                 |           |
| Surface        | Class A              | 410 sks         | 15.60           | 1.18             | 70.0          | 0'              | 8         |
| Coal           |                      |                 |                 |                  |               |                 |           |
| Intermediate 1 | Class A              | 940 sks         | 15.60           | 1.18             | 171.0         | 0'              | 8         |
| Intermediate 2 |                      |                 |                 |                  |               |                 |           |
| Intermediate 3 |                      |                 |                 |                  |               |                 |           |
| Production     | Class A              | 3424 sks        | 14.50           | 1.31             | 356.0         | 3000.9'         | 8         |
| Tubing         |                      |                 |                 |                  |               |                 |           |

Drillers TD (ft) 6381'

Loggers TD (ft) 6381'

Deepest formation penetrated: Marcellus

Plug back to (ft) Not a Pilot Hole

Plug back procedure: Not a Pilot Hole

Kick Off Depth (ft) 5785'

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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 / Surface - 4 centralizers used, one every third joint. Intermediate - 27 centralizers used. Bow spring centralizers on every joint to KOP, on every third joint from KOP to 100' from surface casing. Production - 263 centralizers used. Rigid Bow spring centralizer every third joint from KOP to TOC, rigid bow spring centralizer every joint to KOP.

WAS WELL COMPLETED AS SHOT HOLE  Yes  No DETAILS Plug And Perforation Shot Hole *JOB 3/14/2018*

WAS WELL COMPLETED OPEN HOLE  Yes  No DETAILS \_\_\_\_\_

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         | 8/28/2017        | 15836                  | 15975                | 40                     | Marcellus    |
| 2         | 8/28/2017        | 15617                  | 15800                | 40                     | Marcellus    |
| 3         | 8/28/2017        | 15391                  | 15574                | 40                     | Marcellus    |
| 4         | 8/28/2017        | 15165                  | 15348                | 40                     | Marcellus    |
| 5         | 8/29/2017        | 14939                  | 15122                | 40                     | Marcellus    |
| 6         | 8/29/2017        | 14713                  | 14896                | 40                     | Marcellus    |
| 7         | 8/29/2017        | 14487                  | 14670                | 40                     | Marcellus    |
| 8         | 8/29/2017        | 14241                  | 14444                | 40                     | Marcellus    |
| 9         | 8/30/2017        | 14035                  | 14218                | 40                     | Marcellus    |
| 10        | 8/30/2017        | 13809                  | 13992                | 40                     | Marcellus    |
| 11        | 8/30/2017        | 13583                  | 13766                | 40                     | Marcellus    |
| 12        | 8/30/2017        | 13357                  | 13540                | 40                     | Marcellus    |
| 13        | 8/31/2017        | 13131                  | 13314                | 40                     | Marcellus    |
| 14        | 8/31/2017        | 12905                  | 13088                | 40                     | Marcellus    |
| 15        | 8/31/2017        | 12679                  | 12862                | 40                     | Marcellus    |
| 16        | 8/31/2017        | 12453                  | 12636                | 40                     | Marcellus    |
| 17        | 9/1/2017         | 12227                  | 12410                | 40                     | Marcellus    |
| 18        | 9/1/2017         | 12001                  | 12184                | 40                     | Marcellus    |
| 19        | 9/1/2017         | 11775                  | 11958                | 40                     | Marcellus    |
| 20        | 9/1/2017         | 11549                  | 11732                | 40                     | Marcellus    |
| 21        | 9/1/2017         | 11323                  | 11506                | 40                     | Marcellus    |
| 22        | 9/2/2017         | 11097                  | 11280                | 40                     | Marcellus    |
| 23        | 9/2/2017         | 10871                  | 11054                | 40                     | Marcellus    |
| 24        | 9/2/2017         | 10645                  | 10828                | 40                     | Marcellus    |
| 25        | 9/2/2017         | 10419                  | 10602                | 40                     | Marcellus    |
| 26        | 9/3/2017         | 10193                  | 10376                | 40                     | Marcellus    |
| 27        | 9/3/2017         | 9967                   | 10150                | 40                     | Marcellus    |
| 28        | 9/3/2017         | 9741                   | 9946                 | 40                     | Marcellus    |
| 29        | 9/3/2017         | 9515                   | 9698                 | 40                     | Marcellus    |
| 30        | 9/4/2017         | 9289                   | 9472                 | 40                     | Marcellus    |
| 31        | 9/4/2017         | 9063                   | 9246                 | 40                     | Marcellus    |
| 32        | 9/4/2017         | 8837                   | 9020                 | 40                     | Marcellus    |
| 33        | 9/4/2017         | 8611                   | 8794                 | 40                     | Marcellus    |
| 34        | 9/4/2017         | 8385                   | 8568                 | 40                     | Marcellus    |
| 35        | 9/5/2017         | 8159                   | 8342                 | 40                     | Marcellus    |
| 36        | 9/5/2017         | 7933                   | 8116                 | 40                     | Marcellus    |
| 37        | 9/5/2017         | 7707                   | 7890                 | 40                     | Marcellus    |
| 38        | 9/5/2017         | 7481                   | 7664                 | 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         | 8/28/2017         | 83                  | 8160                         | 7328                         | 3806       | 398180                   | 8775                   | 3506                              |
| 2         | 8/28/2017         | 84                  | 7837                         | 5269                         | 4184       | 400060                   | 8644                   | 3427                              |
| 3         | 8/28/2017         | 87                  | 8180                         | 6152                         | 4342       | 400560                   | 8062                   | 6295                              |
| 4         | 8/29/2017         | 84                  | 8289                         | 6572                         | 4154       | 400080                   | 6820                   | 3267                              |
| 5         | 8/29/2017         | 80                  | 8181                         | 6269                         | 3911       | 400640                   | 7047                   | 3443                              |
| 6         | 8/29/2017         | 79                  | 8081                         | 6729                         | 4265       | 405500                   | 8228                   | 3459                              |
| 7         | 8/29/2017         | 79                  | 7977                         | 6844                         | 4255       | 399980                   | 7088                   | 3293                              |
| 8         | 8/30/2017         | 81                  | 7881                         | 6805                         | 5081       | 404580                   | 9646                   | 3259                              |
| 9         | 8/30/2017         | 84                  | 7991                         | 7108                         | 4504       | 400000                   | 7692                   | 3189                              |
| 10        | 8/30/2017         | 81                  | 7963                         | 7590                         | 4213       | 352380                   | 6850                   | 3375                              |
| 11        | 8/30/2017         | 78                  | 7853                         | 6561                         | 4329       | 359660                   | 6508                   | 3358                              |
| 12        | 8/30/2017         | 90                  | 8105                         | 6540                         | 4930       | 400040                   | 8251                   | 3521                              |
| 13        | 8/31/2017         | 90                  | 8129                         | 6121                         | 4519       | 400360                   | 6536                   | 3479                              |
| 14        | 8/31/2017         | 89                  | 8127                         | 6575                         | 4097       | 395000                   | 7079                   | 3242                              |
| 15        | 8/31/2017         | 93                  | 8436                         | 6420                         | 4620       | 352920                   | 6644                   | 3395                              |
| 16        | 9/1/2017          | 89                  | 7945                         | 6147                         | 4556       | 400700                   | 6634                   | 3456                              |
| 17        | 9/1/2017          | 91                  | 7841                         | 5990                         | 4780       | 404020                   | 6529                   | 3417                              |
| 18        | 9/1/2017          | 83                  | 7605                         | 6115                         | 4002       | 397720                   | 6499                   | 3303                              |
| 19        | 9/1/2017          | 82                  | 7530                         | 5974                         | 3898       | 405860                   | 6583                   | 3243                              |
| 20        | 9/1/2017          | 90                  | 8004                         | 6247                         | 4972       | 381180                   | 6274                   | 3371                              |
| 21        | 9/2/2017          | 84                  | 7798                         | 6846                         | 4503       | 392140                   | 6339                   | 3416                              |
| 22        | 9/2/2017          | 84                  | 7768                         | 6412                         | 4097       | 400680                   | 7593                   | 3409                              |
| 23        | 9/2/2017          | 85                  | 7507                         | 7191                         | 4039       | 405020                   | 6991                   | 3300                              |
| 24        | 9/2/2017          | 88                  | 7634                         | 6863                         | 4170       | 403900                   | 7051                   | 3292                              |
| 25        | 9/3/2017          | 89                  | 7831                         | 6128                         | 4542       | 402600                   | 6542                   | 3194                              |
| 26        | 9/3/2017          | 88                  | 7903                         | 6432                         | 4416       | 400840                   | 6570                   | 3233                              |
| 27        | 9/3/2017          | 89                  | 7793                         | 6408                         | 4271       | 401620                   | 6368                   | 3300                              |
| 28        | 9/3/2017          | 88                  | 7571                         | 6845                         | 4969       | 405240                   | 6383                   | 3274                              |
| 29        | 9/3/2017          | 90                  | 7738                         | 5959                         | 4552       | 400860                   | 6387                   | 3186                              |
| 30        | 9/4/2017          | 91                  | 7736                         | 6485                         | 4951       | 392120                   | 6051                   | 3250                              |
| 31        | 9/4/2017          | 91                  | 7566                         | 6135                         | 4387       | 406220                   | 6350                   | 3252                              |
| 32        | 9/4/2017          | 90                  | 7525                         | 7464                         | 4039       | 404960                   | 6204                   | 3324                              |
| 33        | 9/4/2017          | 89                  | 7237                         | 6220                         | 5219       | 395560                   | 6195                   | 3170                              |
| 34        | 9/5/2017          | 94                  | 7596                         | 5709                         | 4453       | 400720                   | 6198                   | 3232                              |
| 35        | 9/5/2017          | 95                  | 7639                         | 5414                         | 4387       | 398720                   | 6227                   | 3305                              |
| 36        | 9/5/2017          | 96                  | 7627                         | 6376                         | 4998       | 404940                   | 6346                   | 3188                              |
| 37        | 9/5/2017          | 96                  | 7613                         | 6417                         | 5027       | 397300                   | 6192                   | 3297                              |
| 38        | 9/5/2017          | 95                  | 7555                         | 5830                         | 4391       | 401240                   | 6018                   | 3269                              |

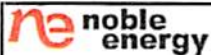




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| LITHOLOGY /<br>FORMATION | TOP         | BOTTOM      | TOP         | BOTTOM      | DESCRIBE ROCK TYPE AND RECORD QUANTITY<br>TYPE OF FLUID<br>(FRESHWATER,BRINE,GAS,H2S, ETC) |
|--------------------------|-------------|-------------|-------------|-------------|--|
|                          | DEPTH IN FT | DEPTH IN FT | DEPTH IN FT | DEPTH IN FT |  |
|                          | TVD         | TVD         | MD          | MD          |  |
| SHALE                    | 0           | 1020        |             |             |  |
| SHALE AND SANDSTONE      | 1020        | 1743        |             |             |  |
| BIG LIME                 | 1743        | 1871        |             |             |  |
| BIG INJUN                | 1871        | 1978        |             |             |  |
| PRICE                    | 1978        | 2129        |             |             |  |
| WEIR                     | 2129        | 2233        |             |             |  |
| SHALE                    | 2233        | 2320        |             |             |  |
| BEREA                    | 2320        | 2328        |             |             |  |
| SHALE                    | 2328        | 2509        |             |             |  |
| SANDSTONE                | 2509        | 2611        |             |             |  |
| SHALE                    | 2611        | 2747        |             |             |  |
| SANDSTONE                | 2747        | 2765        |             |             |  |
| SHALE                    | 2765        | 3239        |             |             |  |
| WARREN                   | 3239        | 3285        |             |             |  |
| SHALE AND SANDSTONE      | 3285        | 3637        |             |             |  |
| LOWER HURON              | 3637        | 4395        |             |             |  |
| SANDSTONE                | 4395        | 4433        |             |             |  |
| SHALE                    | 4433        | 4627        |             |             |  |
| SANDSTONE                | 4627        | 4683        |             |             |  |
| SHALE                    | 4683        | 4807        |             |             |  |
| BENSON                   | 4807        | 4851        |             |             |  |
| SHALE                    | 4851        | 5051        |             |             |  |
| ALEXANDER                | 5051        | 5109        |             |             |  |
| SHALE                    | 5109        | 6050        |             |             |  |
| CASHAQUA                 | 6050        | 6161        |             |             |  |
| MIDDLESEX                | 6161        | 6195        |             |             |  |
| WEST RIVER               | 6195        | 6263        |             |             |  |
| BURKETT                  | 6263        | 6297        |             |             |  |
| TULLY                    | 6297        | 6300        |             |             |  |
| HAMILTON                 | 6300        | 6317        |             |             |  |
| MARCELLUS                | 6317        | 6381        |             |             |  |
| ONONDAGA                 | 6381        |             |             |             |  |

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# NOBLE ENERGY

Location: Tyler County, WV  
Field: Tyler  
Facility: SHR-40 Pad

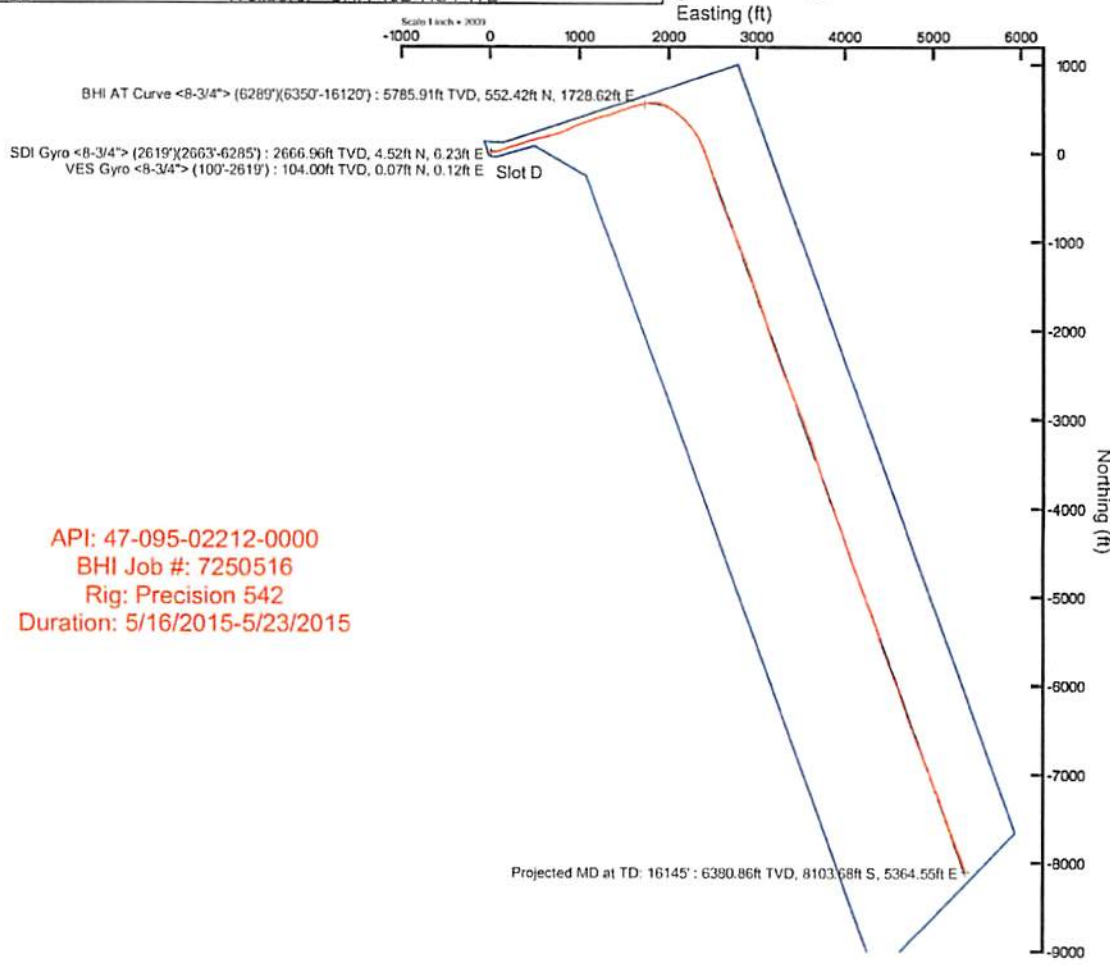
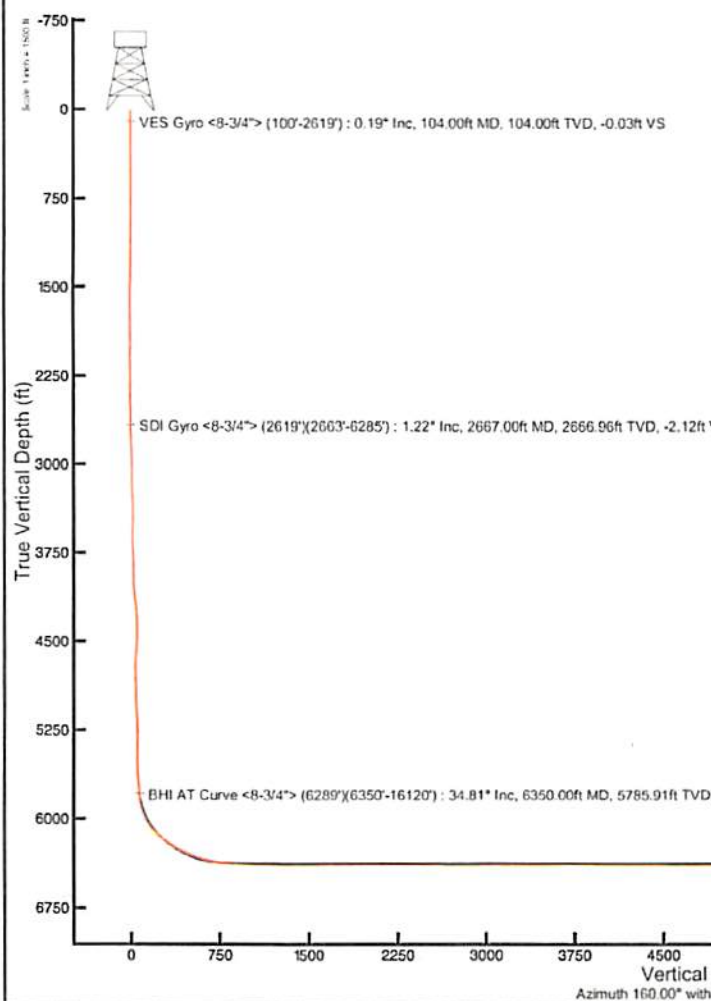
Slot: Slot D  
Well: SHR-40D-HS  
Wellbore: SHR-40D-HS PWB

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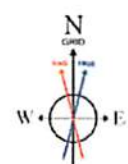


|  |  |
|--|--|
| USGS reference wellpath is SHR-40D-HS PWB Slot D           |  |
| True vertical depths are referenced to Precision 542 (PSB) | Grid System: NAD22 / Latest West Virginia SP, NAD83 Zone 1801, US feet |
| Measured depths are referenced to Precision 542 (PSB)      | North Reference: Grid north  |
| Precision 542 (PSB) to Mean Sea Level: 788.96 feet         | Scale: True distance   |
| Mean Sea Level to Mud line (At Slot D): -709.66 feet       | Depths are in feet   |
| Coordinates are in feet referenced to S84                  | Created by: rebarcor on 22May2015                                      |

| Location Information                        |                   |                    |                   |                    |                |                |
|---|-------------------|--------------------|-------------------|--------------------|----------------|----------------|
| Facility Name                               | Grid East (US ft) | Grid North (US ft) | Latitude          | Longitude          |                |                |
| SHR-40 Pad                                  | 1622022.589       | 336042.458         | 39°24'53.800"N    | 80°50'04.876"W     |                |                |
| Slot  | Local N (ft)      | Local E (ft)       | Grid East (US ft) | Grid North (US ft) | Latitude       | Longitude      |
| Slot D                                      | -50.70            | -31.31             | 1622091.280       | 335991.760         | 39°24'53.294"N | 80°50'05.289"W |
| Precision 542 (PSB) to Mud line (At Slot D) |                   |                    |                   | 19.4ft             |                |                |
| Mean Sea Level to Mud line (At Slot D)      |                   |                    |                   | -769.56ft          |                |                |
| Precision 542 (PSB) to Mean Sea Level       |                   |                    |                   | 788.96ft           |                |                |



API: 47-095-02212-0000  
BHI Job #: 7250516  
Rig: Precision 542  
Duration: 5/16/2015-5/23/2015



User specified (HDGM) Dip: 06.93° Field: 52421 nT  
Magnetic North is 7.38 degrees West of True North (at 08/May/2015)  
Grid North is 0.85 degrees West of True North  
To correct azimuth from True to Grid add 0.85 degrees  
To correct azimuth from Magnetic to Grid subtract 6.53 degrees



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**ACTUAL WELLPATH REPORT (CSV version)**

Prepared by Baker Hughes  
 Software System: WellArchitect® 4.0.1

**REFERENCE WELLPATH IDENTIFICATION**

Operator NOBLE ENERGY  
 Area Tyler County, WV  
 Field Tyler  
 Facility SHR-40 Pad  
 Slot Slot D  
 Well SHR-40D-HS  
 Wellbore SHR-40D-HS AWB  
 Wellpath SHR-40D-HS AWP Proj: 16145'  
 Sidetrack (none)

**REPORT SETUP INFORMATION**

Projection NAD27 / Lambert West Virginia SP, Northern Zone (4701), US feet  
 North Refe Grid  
 Scale 0.999948  
 Convergen 0.85° West  
 Software S WellArchitect® 4.0.1  
 User Edsaryar  
 Report Ger 22/May/2015 at 10:46  
 DataBase:/WellArchitectEasternDB/ev2021.xml

| WELLPATH     | Local North [ft] | Local East [ft] | Easting [US ft] | Northing [US ft] | Latitude    | Longitude      |
|--------------|------------------|-----------------|-----------------|------------------|-------------|----------------|
| Slot Locat   | -50.7            | -31.31          | 1622891         | 335991.8         | 39°24'53.2" | 80°50'05.259"W |
| Facility Ref |                  |                 | 1622923         | 336042.5         | 39°24'53.8" | 80°50'04.870"W |
| Field Refer  |                  |                 | 609601.2        | 0                | 38°23'48.7" | 84°21'09.765"W |

**WELLPATH DATUM**

Calculation Minimum curvature  
 Horizontal Slot  
 Vertical Re Precision 542 (RKB)  
 MD Refere Precision 542 (RKB)  
 Field Vertic Mean Sea Level  
 Precision 5 788.96ft  
 Precision 5 788.96ft  
 Precision 5 19.40ft  
 Section Ori N 0.00, E 0.00 ft  
 Section Azi 160.00°

**WELLPATH DATA † = interpolated/extrapolated station**

|     | MD [ft] | Inclination [°] | Azimuth [°] | TVD [ft] | Vert Sect [ft] | North [ft] | East [ft] | Grid East [US ft] | Grid North [US ft] | Latitude    | Longitude   | Closure [ft] | Dis Closure [ft] | Dir DLS [°/100ft] | Build Rate [°/100ft] | Turn Rate [°/100ft] |
|-----|---------|-----------------|-------------|----------|----------------|------------|-----------|-------------------|--------------------|-------------|-------------|--------------|------------------|-------------------|----------------------|---------------------|
| †   | 0       | 0               | 59.4        | 0        | 0              | 0          | 0         | 1622891           | 335991.8           | 39°24'53.2" | 80°50'05.2" | 0            | 0                | 0                 | 0                    | 0                   |
| SHL | 19.4    | 0               | 59.4        | 19.4     | 0              | 0          | 0         | 1622891           | 335991.8           | 39°24'53.2" | 80°50'05.2" | 0            | 0                | 0                 | 0                    | 0                   |
|     | 104     | 0.19            | 59.4        | 104      | -0.03          | 0.07       | 0.12      | 1622891           | 335991.8           | 39°24'53.2" | 80°50'05.2" | 0.14         | 59.4             | 0.22              | 0.22                 | 0                   |
|     | 204     | 0.16            | 64.26       | 204      | -0.07          | 0.22       | 0.39      | 1622892           | 335992             | 39°24'53.2" | 80°50'05.2" | 0.45         | 60.922           | 0.03              | -0.03                | 4.86                |
|     | 304     | 0.14            | 89.95       | 304      | -0.04          | 0.28       | 0.64      | 1622892           | 335992             | 39°24'53.2" | 80°50'05.2" | 0.69         | 66.489           | 0.07              | -0.02                | 25.69               |
|     | 404     | 0.2             | 106.09      | 404      | 0.1            | 0.23       | 0.93      | 1622892           | 335992             | 39°24'53.2" | 80°50'05.2" | 0.95         | 76.129           | 0.08              | 0.06                 | 16.14               |
|     | 504     | 0.2             | 110.83      | 504      | 0.32           | 0.12       | 1.26      | 1622893           | 335991.9           | 39°24'53.2" | 80°50'05.2" | 1.26         | 84.619           | 0.02              | 0                    | 4.74                |
|     | 604     | 0.26            | 106.83      | 604      | 0.57           | -0.01      | 1.64      | 1622893           | 335991.8           | 39°24'53.2" | 80°50'05.2" | 1.64         | 90.324           | 0.05              | 0.06                 | -4                  |

|      |       |        |         |       |        |        |         |          |            |            |        |        |      |       |         |
|------|-------|--------|---------|-------|--------|--------|---------|----------|------------|------------|--------|--------|------|-------|---------|
| 704  | 0.15  | 102.02 | 704     | 0.77  | -0.1   | 1.98   | 1622893 | 335991.7 | 39°24'53.2 | 80°50'05.2 | 1.99   | 92.95  | 0.11 | -0.11 | -4.81   |
| 804  | 0.36  | 103.98 | 804     | 1.02  | -0.21  | 2.42   | 1622894 | 335991.6 | 39°24'53.2 | 80°50'05.2 | 2.42   | 94.858 | 0.21 | 0.21  | 1.96    |
| 904  | 0.31  | 88.56  | 903.99  | 1.28  | -0.27  | 2.99   | 1622894 | 335991.5 | 39°24'53.2 | 80°50'05.2 | 3      | 95.242 | 0.1  | -0.05 | -15.42  |
| 1004 | 0.32  | 79.5   | 1003.99 | 1.41  | -0.22  | 3.54   | 1622895 | 335991.5 | 39°24'53.2 | 80°50'05.2 | 3.54   | 93.508 | 0.05 | 0.01  | -9.06   |
| 1104 | 0.34  | 44.29  | 1103.99 | 1.33  | 0.05   | 4.02   | 1622895 | 335991.8 | 39°24'53.2 | 80°50'05.2 | 4.02   | 89.337 | 0.2  | 0.02  | -35.21  |
| 1204 | 0.35  | 23.11  | 1203.99 | 0.98  | 0.54   | 4.35   | 1622896 | 335992.3 | 39°24'53.3 | 80°50'05.2 | 4.38   | 82.919 | 0.13 | 0.01  | -21.18  |
| 1304 | 0.45  | 6.45   | 1303.99 | 0.4   | 1.21   | 4.51   | 1622896 | 335993   | 39°24'53.3 | 80°50'05.2 | 4.67   | 74.969 | 0.15 | 0.1   | -16.66  |
| 1404 | 0.35  | 11.27  | 1403.98 | -0.21 | 1.9    | 4.61   | 1622896 | 335993.7 | 39°24'53.3 | 80°50'05.2 | 4.99   | 67.608 | 0.11 | -0.1  | 4.82    |
| 1504 | 0.42  | 18.27  | 1503.98 | -0.76 | 2.55   | 4.79   | 1622896 | 335994.3 | 39°24'53.3 | 80°50'05.1 | 5.42   | 61.976 | 0.08 | 0.07  | 7       |
| 1604 | 0.42  | 16.37  | 1603.98 | -1.34 | 3.25   | 5.01   | 1622896 | 335995   | 39°24'53.3 | 80°50'05.1 | 5.97   | 57.024 | 0.01 | 0     | -1.9    |
| 1704 | 0.32  | 19.18  | 1703.98 | -1.85 | 3.86   | 5.2    | 1622896 | 335995.6 | 39°24'53.3 | 80°50'05.1 | 6.48   | 53.395 | 0.1  | -0.1  | 2.81    |
| 1804 | 0.28  | 23.71  | 1803.98 | -2.24 | 4.35   | 5.39   | 1622897 | 335996.1 | 39°24'53.3 | 80°50'05.1 | 6.93   | 51.095 | 0.05 | -0.04 | 4.53    |
| 1904 | 0.31  | 15.58  | 1903.97 | -2.64 | 4.84   | 5.56   | 1622897 | 335996.6 | 39°24'53.3 | 80°50'05.1 | 7.37   | 48.999 | 0.05 | 0.03  | -8.13   |
| 2004 | 0.35  | 10.27  | 2003.97 | -3.13 | 5.4    | 5.69   | 1622897 | 335997.2 | 39°24'53.3 | 80°50'05.1 | 7.84   | 46.513 | 0.05 | 0.04  | -5.31   |
| 2104 | 0.2   | 12.57  | 2103.97 | -3.54 | 5.87   | 5.78   | 1622897 | 335997.6 | 39°24'53.3 | 80°50'05.1 | 8.24   | 44.579 | 0.15 | -0.15 | 2.3     |
| 2204 | 0.07  | 16.84  | 2203.97 | -3.73 | 6.1    | 5.84   | 1622897 | 335997.9 | 39°24'53.3 | 80°50'05.1 | 8.44   | 43.758 | 0.13 | -0.13 | 4.27    |
| 2304 | 0     | 35.08  | 2303.97 | -3.78 | 6.15   | 5.85   | 1622897 | 335997.9 | 39°24'53.3 | 80°50'05.1 | 8.49   | 43.571 | 0.07 | -0.07 | 0       |
| 2404 | 0.15  | 179.3  | 2403.97 | -3.66 | 6.02   | 5.86   | 1622897 | 335997.8 | 39°24'53.3 | 80°50'05.1 | 8.4    | 44.194 | 0.15 | 0.15  | 0       |
| 2504 | 0.3   | 185.34 | 2503.97 | -3.3  | 5.63   | 5.83   | 1622897 | 335997.4 | 39°24'53.3 | 80°50'05.1 | 8.11   | 46.008 | 0.15 | 0.15  | 6.04    |
| 2589 | 0.32  | 187.1  | 2588.97 | -2.88 | 5.17   | 5.78   | 1622897 | 335996.9 | 39°24'53.3 | 80°50'05.1 | 7.76   | 48.18  | 0.03 | 0.02  | 2.07    |
| 2623 | 0.47  | 170.07 | 2622.97 | -2.66 | 4.94   | 5.8    | 1622897 | 335996.7 | 39°24'53.3 | 80°50'05.1 | 7.62   | 49.539 | 0.56 | 0.44  | -50.09  |
| 2667 | 1.22  | 120.9  | 2666.96 | -2.12 | 4.52   | 6.23   | 1622898 | 335996.3 | 39°24'53.3 | 80°50'05.1 | 7.7    | 54.004 | 2.23 | 1.7   | -111.75 |
| 2712 | 2.74  | 109.63 | 2711.94 | -1.06 | 3.92   | 7.65   | 1622899 | 335995.7 | 39°24'53.3 | 80°50'05.1 | 8.6    | 62.893 | 3.47 | 3.38  | -25.04  |
| 2756 | 4.08  | 100.96 | 2755.86 | 0.41  | 3.27   | 10.18  | 1622901 | 335995   | 39°24'53.3 | 80°50'05.1 | 10.69  | 72.21  | 3.25 | 3.05  | -19.7   |
| 2800 | 5.27  | 91.34  | 2799.71 | 1.95  | 2.92   | 13.74  | 1622905 | 335994.7 | 39°24'53.3 | 80°50'05.0 | 14.04  | 77.993 | 3.23 | 2.7   | -21.86  |
| 2844 | 6.66  | 87.95  | 2843.47 | 3.47  | 2.97   | 18.31  | 1622910 | 335994.7 | 39°24'53.3 | 80°50'05.0 | 18.55  | 80.798 | 3.26 | 3.16  | -7.7    |
| 2888 | 7.75  | 85.51  | 2887.12 | 5.05  | 3.29   | 23.82  | 1622915 | 335995.1 | 39°24'53.3 | 80°50'04.9 | 24.04  | 82.136 | 2.57 | 2.48  | -5.55   |
| 2932 | 8.17  | 83.86  | 2930.7  | 6.6   | 3.86   | 29.88  | 1622921 | 335995.6 | 39°24'53.3 | 80°50'04.8 | 30.13  | 82.647 | 1.09 | 0.95  | -3.75   |
| 2977 | 8.23  | 81.3   | 2975.24 | 7.99  | 4.69   | 36.24  | 1622928 | 335996.4 | 39°24'53.3 | 80°50'04.7 | 36.55  | 82.634 | 0.82 | 0.13  | -5.69   |
| 3021 | 8.07  | 77.98  | 3018.8  | 9.04  | 5.8    | 42.38  | 1622934 | 335997.6 | 39°24'53.3 | 80°50'04.7 | 42.77  | 82.201 | 1.13 | -0.36 | -7.55   |
| 3065 | 7.88  | 73.29  | 3062.37 | 9.64  | 7.32   | 48.29  | 1622940 | 335999.1 | 39°24'53.3 | 80°50'04.6 | 48.84  | 81.386 | 1.54 | -0.43 | -10.66  |
| 3109 | 8.65  | 71.93  | 3105.91 | 9.93  | 9.21   | 54.32  | 1622946 | 336001   | 39°24'53.3 | 80°50'04.5 | 55.1   | 80.379 | 1.81 | 1.75  | -3.09   |
| 3153 | 10.09 | 73.33  | 3149.32 | 10.26 | 11.34  | 61.16  | 1622952 | 336003.1 | 39°24'53.4 | 80°50'04.4 | 62.2   | 79.495 | 3.31 | 3.27  | 3.18    |
| 3198 | 11.87 | 76.76  | 3193.5  | 11.04 | 13.53  | 69.44  | 1622961 | 336005.3 | 39°24'53.4 | 80°50'04.3 | 70.75  | 78.973 | 4.21 | 3.96  | 7.62    |
| 3242 | 13.6  | 81.12  | 3236.42 | 12.57 | 15.37  | 78.96  | 1622970 | 336007.1 | 39°24'53.4 | 80°50'04.2 | 80.44  | 78.987 | 4.5  | 3.93  | 9.91    |
| 3286 | 15.26 | 83.1   | 3279.03 | 14.88 | 16.86  | 89.82  | 1622981 | 336008.6 | 39°24'53.4 | 80°50'04.1 | 91.39  | 79.368 | 3.94 | 3.77  | 4.5     |
| 3330 | 16.69 | 79.22  | 3321.33 | 17.2  | 18.74  | 101.78 | 1622993 | 336010.5 | 39°24'53.4 | 80°50'03.9 | 103.49 | 79.568 | 4.05 | 3.25  | -8.82   |
| 3374 | 17.64 | 74.29  | 3363.37 | 18.71 | 21.73  | 114.4  | 1623006 | 336013.5 | 39°24'53.5 | 80°50'03.8 | 116.45 | 79.247 | 3.95 | 2.16  | -11.2   |
| 3419 | 18.47 | 68.82  | 3406.16 | 19.08 | 26.15  | 127.61 | 1623019 | 336017.9 | 39°24'53.5 | 80°50'03.6 | 130.26 | 78.42  | 4.19 | 1.84  | -12.16  |
| 3463 | 19.03 | 65.41  | 3447.82 | 18.36 | 31.65  | 140.64 | 1623032 | 336023.4 | 39°24'53.6 | 80°50'03.4 | 144.15 | 77.316 | 2.8  | 1.27  | -7.75   |
| 3507 | 20.4  | 65.4   | 3489.24 | 17.17 | 37.83  | 154.13 | 1623045 | 336029.6 | 39°24'53.6 | 80°50'03.3 | 158.71 | 76.21  | 3.11 | 3.11  | -0.02   |
| 3551 | 21.95 | 66.96  | 3530.27 | 16.12 | 44.24  | 168.67 | 1623060 | 336036   | 39°24'53.7 | 80°50'03.1 | 174.38 | 75.303 | 3.75 | 3.52  | 3.55    |
| 3595 | 23.82 | 69.11  | 3570.81 | 15.54 | 50.63  | 184.54 | 1623076 | 336042.4 | 39°24'53.8 | 80°50'02.9 | 191.36 | 74.659 | 4.65 | 4.25  | 4.89    |
| 3639 | 25.13 | 70.1   | 3610.85 | 15.42 | 56.98  | 201.63 | 1623093 | 336048.7 | 39°24'53.8 | 80°50'02.7 | 209.53 | 74.221 | 3.12 | 2.98  | 2.25    |
| 3684 | 26.93 | 72.14  | 3651.29 | 15.82 | 63.35  | 220.32 | 1623112 | 336055.1 | 39°24'53.9 | 80°50'02.4 | 229.24 | 73.957 | 4.47 | 4     | 4.53    |
| 3728 | 28.51 | 75.61  | 3690.24 | 17.22 | 69.02  | 239.97 | 1623131 | 336060.8 | 39°24'54.0 | 80°50'02.2 | 249.7  | 73.954 | 5.13 | 3.59  | 7.89    |
| 3772 | 30.29 | 77.2   | 3728.57 | 19.64 | 74.09  | 260.97 | 1623152 | 336065.8 | 39°24'54.0 | 80°50'01.9 | 271.28 | 74.151 | 4.42 | 4.05  | 3.61    |
| 3816 | 32.06 | 75.16  | 3766.22 | 22.08 | 79.54  | 283.08 | 1623174 | 336071.3 | 39°24'54.1 | 80°50'01.6 | 294.04 | 74.306 | 4.68 | 4.02  | -4.64   |
| 3860 | 33.31 | 72.64  | 3803.25 | 23.68 | 86.14  | 305.9  | 1623197 | 336077.9 | 39°24'54.1 | 80°50'01.3 | 317.8  | 74.274 | 4.2  | 2.84  | -5.73   |
| 3904 | 34.17 | 70.4   | 3839.84 | 24.33 | 93.89  | 329.07 | 1623220 | 336085.6 | 39°24'54.2 | 80°50'01.0 | 342.2  | 74.076 | 3.44 | 1.95  | -5.09   |
| 3948 | 35.31 | 69.42  | 3876    | 24.28 | 102.5  | 352.62 | 1623244 | 336094.3 | 39°24'54.3 | 80°50'00.7 | 367.21 | 73.792 | 2.89 | 2.59  | -2.23   |
| 3993 | 36.98 | 70.24  | 3912.33 | 24.21 | 111.65 | 377.53 | 1623269 | 336103.4 | 39°24'54.4 | 80°50'00.4 | 393.7  | 73.525 | 3.86 | 3.71  | 1.82    |
| 4037 | 38.33 | 71.22  | 3947.17 | 24.55 | 120.52 | 402.91 | 1623294 | 336112.3 | 39°24'54.5 | 80°50'00.1 | 420.54 | 73.347 | 3.36 | 3.07  | 2.23    |
| 4081 | 39.95 | 71.31  | 3981.29 | 25.17 | 129.44 | 429.21 | 1623320 | 336121.2 | 39°24'54.6 | 80°49'59.8 | 448.3  | 73.218 | 3.68 | 3.68  | 0.2     |
| 4125 | 41.47 | 72.93  | 4014.65 | 26.24 | 138.24 | 456.52 | 1623348 | 336130   | 39°24'54.7 | 80°49'59.4 | 476.99 | 73.153 | 4.21 | 3.45  | 3.68    |

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|      |       |        |         |         |         |         |         |          |            |            |         |         |       |       |       |
|------|-------|--------|---------|---------|---------|---------|---------|----------|------------|------------|---------|---------|-------|-------|-------|
| 4169 | 42.82 | 74.03  | 4047.27 | 28.03   | 146.63  | 484.82  | 1623376 | 336138.4 | 39°24'54.8 | 80°49'59.1 | 506.51  | 73.172  | 3.5   | 3.07  | 2.5   |
| 4213 | 43.38 | 75.27  | 4079.4  | 30.47   | 154.59  | 513.82  | 1623405 | 336146.3 | 39°24'54.8 | 80°49'58.7 | 536.57  | 73.255  | 2.31  | 1.27  | 2.82  |
| 4258 | 43.52 | 76.4   | 4112.07 | 33.62   | 162.16  | 543.82  | 1623435 | 336153.9 | 39°24'54.9 | 80°49'58.3 | 567.48  | 73.396  | 1.75  | 0.31  | 2.51  |
| 4302 | 43.08 | 76.71  | 4144.09 | 37.06   | 169.18  | 573.17  | 1623464 | 336160.9 | 39°24'55.0 | 80°49'57.9 | 597.62  | 73.556  | 1.11  | -1    | 0.7   |
| 4346 | 42.71 | 77.22  | 4176.32 | 40.69   | 175.93  | 602.35  | 1623494 | 336167.7 | 39°24'55.1 | 80°49'57.6 | 627.51  | 73.718  | 1.15  | -0.84 | 1.16  |
| 4390 | 42.83 | 75.41  | 4208.63 | 43.98   | 183     | 631.37  | 1623523 | 336174.8 | 39°24'55.1 | 80°49'57.2 | 657.36  | 73.836  | 2.81  | 0.27  | -4.11 |
| 4434 | 43.5  | 75.15  | 4240.72 | 46.75   | 190.65  | 660.49  | 1623552 | 336182.4 | 39°24'55.2 | 80°49'56.8 | 687.45  | 73.899  | 1.58  | 1.52  | -0.59 |
| 4478 | 43.47 | 73.5   | 4272.64 | 49.03   | 198.83  | 689.64  | 1623581 | 336190.6 | 39°24'55.3 | 80°49'56.5 | 717.73  | 73.917  | 2.58  | -0.07 | -3.75 |
| 4522 | 42.41 | 73.48  | 4304.85 | 50.86   | 207.35  | 718.38  | 1623610 | 336199.1 | 39°24'55.4 | 80°49'56.1 | 747.7   | 73.9    | 2.41  | -2.41 | -0.05 |
| 4567 | 41.7  | 72.14  | 4338.27 | 52.34   | 216.25  | 747.17  | 1623638 | 336208   | 39°24'55.5 | 80°49'55.7 | 777.84  | 73.858  | 2.54  | -1.58 | -2.98 |
| 4611 | 40.33 | 70.92  | 4371.47 | 53.11   | 225.4   | 774.56  | 1623666 | 336217.1 | 39°24'55.6 | 80°49'55.4 | 806.69  | 73.775  | 3.61  | -3.11 | -2.77 |
| 4655 | 37.84 | 69.53  | 4405.62 | 53.23   | 234.77  | 800.66  | 1623692 | 336226.5 | 39°24'55.7 | 80°49'55.1 | 834.37  | 73.658  | 6     | -5.66 | -3.16 |
| 4699 | 36.71 | 68.58  | 4440.63 | 52.79   | 244.3   | 825.55  | 1623717 | 336236   | 39°24'55.8 | 80°49'54.7 | 860.94  | 73.516  | 2.88  | -2.57 | -2.16 |
| 4788 | 35.94 | 65.35  | 4512.34 | 50.02   | 264.91  | 874.06  | 1623765 | 336256.7 | 39°24'56.0 | 80°49'54.1 | 913.32  | 73.139  | 2.32  | -0.87 | -3.63 |
| 4876 | 34.6  | 63.34  | 4584.19 | 45.02   | 286.89  | 919.86  | 1623811 | 336278.6 | 39°24'56.2 | 80°49'53.5 | 963.56  | 72.678  | 2.01  | -1.52 | -2.28 |
| 4964 | 32.63 | 65.83  | 4657.47 | 40.4    | 307.82  | 963.84  | 1623855 | 336299.6 | 39°24'56.4 | 80°49'53.0 | 1011.8  | 72.288  | 2.73  | -2.24 | 2.83  |
| 5053 | 32.59 | 71.26  | 4732.46 | 39.18   | 325.35  | 1008.44 | 1623900 | 336317.1 | 39°24'56.6 | 80°49'52.4 | 1059.62 | 72.119  | 3.29  | -0.04 | 6.1   |
| 5141 | 34.16 | 72.5   | 4805.94 | 40.78   | 340.39  | 1054.45 | 1623946 | 336332.1 | 39°24'56.8 | 80°49'51.8 | 1108.03 | 72.109  | 1.95  | 1.78  | 1.41  |
| 5230 | 36.74 | 70.66  | 4878.44 | 42.18   | 356.72  | 1103.41 | 1623995 | 336348.5 | 39°24'56.9 | 80°49'51.2 | 1159.64 | 72.084  | 3.14  | 2.9   | -2.07 |
| 5318 | 36.89 | 70.49  | 4948.89 | 42.71   | 374.26  | 1153.14 | 1624044 | 336366   | 39°24'57.1 | 80°49'50.6 | 1212.35 | 72.019  | 0.21  | 0.17  | -0.19 |
| 5406 | 36.09 | 72.71  | 5019.64 | 44.16   | 390.79  | 1202.79 | 1624094 | 336382.5 | 39°24'57.3 | 80°49'50.0 | 1264.68 | 72.001  | 1.75  | -0.91 | 2.52  |
| 5495 | 36.4  | 74.95  | 5091.43 | 47.68   | 405.43  | 1253.32 | 1624145 | 336397.2 | 39°24'57.4 | 80°49'49.3 | 1317.26 | 72.074  | 1.53  | 0.35  | 2.52  |
| 5583 | 37.46 | 75.14  | 5161.77 | 52.33   | 419.08  | 1304.4  | 1624196 | 336410.8 | 39°24'57.6 | 80°49'48.7 | 1370.07 | 72.189  | 1.21  | 1.2   | 0.22  |
| 5671 | 38.43 | 72.75  | 5231.17 | 56.04   | 434.05  | 1356.39 | 1624248 | 336425.8 | 39°24'57.7 | 80°49'48.0 | 1424.15 | 72.255  | 2     | 1.1   | -2.72 |
| 5760 | 37.41 | 67.66  | 5301.39 | 56.26   | 452.53  | 1407.82 | 1624299 | 336444.3 | 39°24'57.9 | 80°49'47.4 | 1478.77 | 72.18   | 3.7   | -1.15 | -5.72 |
| 5848 | 34.27 | 69.07  | 5372.72 | 54.77   | 471.55  | 1455.7  | 1624347 | 336463.3 | 39°24'58.1 | 80°49'46.8 | 1530.17 | 72.051  | 3.69  | -3.57 | 1.6   |
| 5936 | 32.43 | 71.47  | 5446.23 | 54.97   | 487.9   | 1501.22 | 1624392 | 336479.6 | 39°24'58.3 | 80°49'46.2 | 1578.52 | 71.996  | 2.57  | -2.09 | -0.73 |
| 6024 | 35.11 | 70.83  | 5519.38 | 55.94   | 503.71  | 1547.51 | 1624439 | 336495.5 | 39°24'58.4 | 80°49'45.6 | 1627.42 | 71.97   | 3.07  | 3.05  | -0.73 |
| 6113 | 35.05 | 72.75  | 5592.21 | 57.54   | 519.7   | 1596.09 | 1624487 | 336511.4 | 39°24'58.6 | 80°49'45.0 | 1678.57 | 71.964  | 1.24  | -0.07 | 2.16  |
| 6201 | 34.56 | 76.1   | 5664.48 | 61.4    | 533.19  | 1644.45 | 1624536 | 336524.9 | 39°24'58.8 | 80°49'44.4 | 1728.73 | 72.036  | 2.24  | -0.56 | 3.81  |
| 6289 | 36.17 | 78.16  | 5736.24 | 67.74   | 544.51  | 1694.1  | 1624585 | 336536.2 | 39°24'58.9 | 80°49'43.7 | 1779.46 | 72.182  | 2.28  | 1.83  | 2.34  |
| 6350 | 34.81 | 76.01  | 5785.91 | 72.12   | 552.42  | 1728.62 | 1624620 | 336544.2 | 39°24'59.0 | 80°49'43.3 | 1814.74 | 72.278  | 3.03  | -2.23 | -3.52 |
| 6439 | 36.84 | 77.21  | 5858.07 | 78.13   | 564.47  | 1779.29 | 1624670 | 336556.2 | 39°24'59.1 | 80°49'42.6 | 1866.68 | 72.399  | 2.41  | 2.28  | 1.35  |
| 6574 | 41.69 | 99.05  | 5963.06 | 105.15  | 566.37  | 1863.55 | 1624755 | 336558.1 | 39°24'59.1 | 80°49'41.6 | 1947.72 | 73.095  | 10.8  | 3.59  | 16.18 |
| 6663 | 43.13 | 109.71 | 6028.86 | 139.01  | 551.44  | 1921.5  | 1624813 | 336543.2 | 39°24'59.0 | 80°49'40.8 | 1999.06 | 73.987  | 8.23  | 1.62  | 11.98 |
| 6753 | 48.68 | 120.81 | 6091.56 | 184.97  | 523.69  | 1979.63 | 1624871 | 336515.4 | 39°24'58.7 | 80°49'40.1 | 2047.72 | 75.183  | 10.78 | 6.17  | 12.33 |
| 6842 | 54.34 | 127.26 | 6146.97 | 241.37  | 484.62  | 2037.19 | 1624928 | 336476.4 | 39°24'58.3 | 80°49'39.3 | 2094.04 | 76.619  | 8.52  | 6.36  | 7.25  |
| 6932 | 57.47 | 129.28 | 6197.41 | 304.76  | 438.45  | 2095.68 | 1624987 | 336430.2 | 39°24'57.9 | 80°49'38.6 | 2141.05 | 78.183  | 3.94  | 3.48  | 2.24  |
| 7022 | 61.37 | 132.78 | 6243.2  | 372.54  | 387.57  | 2154.07 | 1625045 | 336379.3 | 39°24'57.4 | 80°49'37.8 | 2188.66 | 79.8    | 5.48  | 4.33  | 3.89  |
| 7111 | 66.69 | 137.27 | 6282.18 | 445.05  | 330.96  | 2210.54 | 1625102 | 336322.7 | 39°24'56.8 | 80°49'37.1 | 2235.17 | 81.485  | 7.5   | 5.98  | 5.04  |
| 7200 | 69.76 | 142.48 | 6315.21 | 522.62  | 267.77  | 2263.74 | 1625155 | 336259.5 | 39°24'56.2 | 80°49'36.4 | 2279.52 | 83.254  | 6.44  | 3.45  | 5.85  |
| 7290 | 73.98 | 147.04 | 6343.22 | 605.11  | 197.93  | 2313.03 | 1625204 | 336189.7 | 39°24'55.5 | 80°49'35.8 | 2321.48 | 85.109  | 6.72  | 4.69  | 5.07  |
| 7380 | 79.07 | 152.37 | 6364.2  | 691.17  | 122.39  | 2357.11 | 1625248 | 336114.1 | 39°24'54.8 | 80°49'35.2 | 2360.29 | 87.028  | 8.07  | 5.66  | 5.92  |
| 7469 | 84.95 | 158.35 | 6376.58 | 778.94  | 42.34   | 2393.79 | 1625285 | 336034.1 | 39°24'54.0 | 80°49'34.7 | 2394.17 | 88.987  | 9.37  | 6.61  | 6.72  |
| 7559 | 87.08 | 161.86 | 6382.83 | 868.7   | -42.07  | 2424.34 | 1625315 | 335949.7 | 39°24'53.2 | 80°49'34.3 | 2424.7  | 90.994  | 4.55  | 2.37  | 3.9   |
| 7649 | 87.01 | 162.9  | 6387.47 | 958.5   | -127.73 | 2451.54 | 1625343 | 335864   | 39°24'52.3 | 80°49'34.0 | 2454.87 | 92.983  | 1.16  | -0.08 | 1.16  |
| 7738 | 88.68 | 161.07 | 6390.82 | 1047.38 | -212.3  | 2479.05 | 1625370 | 335779.5 | 39°24'51.5 | 80°49'33.6 | 2488.12 | 94.895  | 2.78  | 1.88  | -2.06 |
| 7828 | 90.03 | 162.25 | 6391.83 | 1137.33 | -297.72 | 2507.36 | 1625399 | 335694.1 | 39°24'50.7 | 80°49'33.2 | 2524.98 | 96.771  | 1.99  | 1.5   | 1.31  |
| 7917 | 90.37 | 163.18 | 6391.52 | 1226.23 | -382.7  | 2533.81 | 1625425 | 335609.1 | 39°24'49.8 | 80°49'32.9 | 2562.54 | 98.589  | 1.11  | 0.38  | 1.04  |
| 8007 | 90.31 | 161.31 | 6390.99 | 1316.16 | -468.41 | 2561.25 | 1625452 | 335523.4 | 39°24'49.0 | 80°49'32.5 | 2603.73 | 100.364 | 2.08  | -0.07 | -2.08 |
| 8096 | 90.31 | 157.26 | 6390.51 | 1405.13 | -551.63 | 2592.72 | 1625484 | 335440.2 | 39°24'48.2 | 80°49'32.1 | 2650.76 | 102.011 | 4.55  | 0     | -4.55 |
| 8186 | 90.31 | 158.99 | 6390.02 | 1495.08 | -635.15 | 2626.25 | 1625517 | 335356.6 | 39°24'47.4 | 80°49'31.6 | 2701.97 | 103.596 | 1.92  | 0     | 1.92  |
| 8275 | 90.28 | 158.75 | 6389.56 | 1584.06 | -718.16 | 2658.34 | 1625549 | 335273.6 | 39°24'46.5 | 80°49'31.2 | 2753.64 | 105.118 | 0.27  | -0.03 | -0.27 |
| 8365 | 90.25 | 158.33 | 6389.15 | 1674.03 | -801.92 | 2691.26 | 1625582 | 335189.9 | 39°24'45.7 | 80°49'30.8 | 2808.2  | 106.593 | 0.47  | -0.03 | -0.47 |
| 8454 | 90.09 | 157.92 | 6388.88 | 1762.98 | -884.52 | 2724.42 | 1625616 | 335107.3 | 39°24'44.9 | 80°49'30.3 | 2864.41 | 107.987 | 0.49  | -0.18 | -0.46 |

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|-------|-------|--------|---------|---------|----------|---------|---------|----------|----------|-----------|---------|---------|------|-------|-------|
| 8544  | 90.12 | 157.75 | 6388.72 | 1852.92 | -967.86  | 2758.38 | 1625650 | 335024   | 392444.1 | 8074929.9 | 2923.25 | 109.335 | 0.19 | 0.03  | -0.19 |
| 8633  | 89.94 | 157.55 | 6388.67 | 1941.84 | -1050.38 | 2792.22 | 1625683 | 334941.6 | 392443.3 | 8074929.4 | 2983.18 | 110.612 | 0.3  | -0.2  | -0.22 |
| 8723  | 89.91 | 157.64 | 6388.79 | 2031.76 | -1133.38 | 2826.53 | 1625718 | 334858.4 | 392442.5 | 8074929.0 | 3045.29 | 111.85  | 0.11 | -0.03 | 0.1   |
| 8812  | 89.85 | 159.71 | 6388.97 | 2120.73 | -1216.29 | 2858.89 | 1625750 | 334775.5 | 392441.6 | 8074928.6 | 3106.86 | 113.047 | 2.33 | -0.07 | 2.33  |
| 8902  | 90.03 | 160.7  | 6389.07 | 2210.73 | -1300.97 | 2889.37 | 1625780 | 334690.9 | 392440.8 | 8074928.2 | 3168.75 | 114.24  | 1.12 | -0.07 | 1.1   |
| 8991  | 89.94 | 161.05 | 6389.09 | 2299.72 | -1385.05 | 2918.53 | 1625810 | 334605.8 | 392440.0 | 8074927.8 | 3230.51 | 115.388 | 0.41 | -0.1  | 0.39  |
| 9080  | 89.85 | 160.94 | 6389.26 | 2388.71 | -1469.61 | 2947.51 | 1625839 | 334521.6 | 392439.2 | 8074927.4 | 3293.38 | 116.494 | 0.16 | -0.1  | -0.12 |
| 9170  | 89.91 | 159.8  | 6389.44 | 2478.7  | -1553.97 | 2977.74 | 1625869 | 334437.9 | 392438.3 | 8074927.0 | 3358.84 | 117.558 | 1.27 | 0.07  | -1.27 |
| 9259  | 89.97 | 160.02 | 6389.54 | 2567.7  | -1637.56 | 3008.31 | 1625899 | 334354.3 | 392437.5 | 8074926.6 | 3425.13 | 118.561 | 0.26 | 0.07  | 0.25  |
| 9349  | 90    | 160.74 | 6389.56 | 2657.7  | -1722.33 | 3038.53 | 1625930 | 334269.5 | 392436.7 | 8074926.2 | 3492.72 | 119.546 | 0.59 | 0.03  | 0.8   |
| 9439  | 89.88 | 160.22 | 6389.65 | 2747.7  | -1807.16 | 3068.61 | 1625960 | 334184.7 | 392435.8 | 8074925.8 | 3561.2  | 120.495 | 0.59 | -0.13 | -0.58 |
| 9528  | 89.97 | 162.82 | 6389.77 | 2836.66 | -1891.56 | 3098.82 | 1625988 | 334100.3 | 392435.0 | 8074925.4 | 3628.81 | 121.417 | 2.92 | 0.1   | 2.92  |
| 9618  | 90.18 | 165.72 | 6389.65 | 2926.4  | -1978.48 | 3121.21 | 1626012 | 334013.7 | 392434.2 | 8074925.0 | 3695.29 | 122.366 | 3.23 | 0.23  | 3.22  |
| 9707  | 90.43 | 162.17 | 6389.18 | 3015.17 | -2063.69 | 3145.82 | 1626037 | 333928.2 | 392433.3 | 8074924.7 | 3762.32 | 123.265 | 4    | 0.28  | -3.99 |
| 9797  | 90.18 | 158.87 | 6388.7  | 3105.15 | -2148.53 | 3175.83 | 1626067 | 333843.4 | 392432.5 | 8074924.3 | 3834.33 | 124.079 | 3.68 | 0.28  | -3.67 |
| 9886  | 90.25 | 159.73 | 6388.37 | 3194.15 | -2231.78 | 3207.29 | 1626098 | 333760.1 | 392431.7 | 8074923.9 | 3907.37 | 124.832 | 0.97 | 0.08  | 0.97  |
| 9976  | 90.09 | 160.45 | 6388.1  | 3284.15 | -2316.4  | 3237.94 | 1626129 | 333675.5 | 392430.8 | 8074923.5 | 3981.2  | 125.58  | 0.82 | -0.18 | 0.8   |
| 10066 | 90.28 | 159.13 | 6387.93 | 3374.14 | -2400.86 | 3269.03 | 1626160 | 333591.9 | 392430.0 | 8074923.1 | 4055.94 | 126.295 | 1.47 | 0.03  | -1.47 |
| 10155 | 90.12 | 158.24 | 6387.62 | 3463.12 | -2483.77 | 3301.38 | 1626192 | 333508.1 | 392429.2 | 8074922.7 | 4131.37 | 126.956 | 1.02 | 0.18  | -1    |
| 10245 | 90.22 | 157.41 | 6387.23 | 3553.05 | -2567.11 | 3335.35 | 1626226 | 333424.8 | 392428.4 | 8074922.2 | 4208.87 | 127.584 | 0.92 | -0.07 | -0.92 |
| 10334 | 90.09 | 157.97 | 6386.99 | 3641.98 | -2649.45 | 3369.13 | 1626260 | 333342.5 | 392427.6 | 8074921.8 | 4286.1  | 128.181 | 0.65 | -0.15 | 0.63  |
| 10424 | 90.22 | 159.08 | 6386.67 | 3731.95 | -2733.2  | 3402.98 | 1626293 | 333258.7 | 392426.7 | 8074921.4 | 4364    | 128.778 | 1.24 | 0.14  | 1.23  |
| 10513 | 89.88 | 157.52 | 6386.67 | 3820.9  | -2815.89 | 3434.98 | 1626326 | 333176.3 | 392425.9 | 8074920.9 | 4441.66 | 129.344 | 1.79 | -0.38 | -1.75 |
| 10603 | 89.69 | 155.84 | 6387.01 | 3910.75 | -2898.53 | 3470.61 | 1626362 | 333093.4 | 392425.1 | 8074920.5 | 4521.8  | 129.867 | 1.88 | -0.21 | -1.87 |
| 10692 | 89.75 | 159.67 | 6387.44 | 3999.66 | -2980.89 | 3504.3  | 1626395 | 333011.3 | 392424.3 | 8074920.0 | 4600.63 | 130.386 | 4.3  | 0.07  | 4.3   |
| 10782 | 89.97 | 161.09 | 6387.66 | 4089.66 | -3065.66 | 3534.3  | 1626426 | 332928.3 | 392423.5 | 8074919.6 | 4678.8  | 130.937 | 1.6  | 0.24  | 1.58  |
| 10872 | 89.94 | 158.84 | 6387.73 | 4179.65 | -3150.21 | 3565.35 | 1626456 | 332844.7 | 392422.6 | 8074919.2 | 4757.68 | 131.463 | 2.5  | -0.03 | -2.5  |
| 10962 | 89.88 | 157.55 | 6387.87 | 4269.61 | -3233.77 | 3598.78 | 1626489 | 332761.7 | 392421.8 | 8074918.8 | 4838.23 | 131.942 | 1.43 | -0.07 | -1.43 |
| 11051 | 89.6  | 163.26 | 6388.28 | 4358.57 | -3317.58 | 3628.62 | 1626520 | 332678.4 | 392421.0 | 8074918.4 | 4916.62 | 132.436 | 6.42 | -0.31 | 6.42  |
| 11141 | 89.48 | 164.47 | 6389    | 4448.36 | -3404.03 | 3658.63 | 1626550 | 332595.7 | 392420.1 | 8074918.0 | 4993.64 | 132.975 | 1.35 | -0.13 | 1.34  |
| 11230 | 89.51 | 162.65 | 6389.79 | 4537.18 | -3489.39 | 3678.81 | 1626579 | 332512.6 | 392419.3 | 8074917.7 | 5070.45 | 133.486 | 2.05 | 0.03  | -2.04 |
| 11320 | 89.51 | 162.03 | 6390.55 | 4627.1  | -3575.14 | 3706.11 | 1626597 | 332428.3 | 392418.5 | 8074917.3 | 5149.46 | 133.97  | 0.69 | 0     | -0.69 |
| 11409 | 89.78 | 162.39 | 6391.11 | 4716.03 | -3659.88 | 3733.3  | 1626624 | 332345.1 | 392417.6 | 8074917.0 | 5228.03 | 134.431 | 0.51 | 0.3   | 0.4   |
| 11499 | 89.82 | 161.47 | 6391.42 | 4805.98 | -3745.44 | 3761.22 | 1626652 | 332262.5 | 392416.8 | 8074916.6 | 5308.02 | 134.88  | 1.02 | 0.04  | -1.02 |
| 11589 | 89.94 | 160.31 | 6391.61 | 4895.97 | -3830.48 | 3790.68 | 1626682 | 332180.5 | 392415.9 | 8074916.2 | 5389.05 | 135.299 | 1.3  | -0.13 | -1.29 |
| 11678 | 89.85 | 158.98 | 6391.77 | 4984.96 | -3913.92 | 3821.64 | 1626713 | 332098.1 | 392415.1 | 8074915.8 | 5470.26 | 135.683 | 1.5  | -0.1  | -1.49 |
| 11768 | 89.82 | 157.86 | 6392.03 | 5074.93 | -3997.61 | 3854.74 | 1626746 | 332016.3 | 392414.3 | 8074915.4 | 5553.37 | 136.042 | 1.24 | -0.03 | -1.24 |
| 11857 | 89.88 | 158.69 | 6392.26 | 5163.88 | -4080.29 | 3887.69 | 1626779 | 331934.7 | 392413.5 | 8074915.0 | 5635.85 | 136.385 | 0.94 | 0.07  | 0.93  |
| 11947 | 89.94 | 159.39 | 6392.41 | 5253.87 | -4164.33 | 3919.88 | 1626811 | 331852.7 | 392412.7 | 8074914.5 | 5719.01 | 136.732 | 0.78 | 0.07  | 0.78  |
| 12037 | 89.91 | 158.99 | 6392.52 | 5343.86 | -4248.46 | 3951.85 | 1626843 | 331771.5 | 392411.8 | 8074914.1 | 5802.29 | 137.072 | 0.45 | -0.03 | -0.44 |
| 12126 | 89.91 | 159.52 | 6392.66 | 5432.85 | -4331.69 | 3983.38 | 1626874 | 331690.3 | 392411.0 | 8074913.7 | 5884.8  | 137.399 | 0.6  | 0     | 0.6   |
| 12216 | 89.91 | 159.52 | 6392.66 | 5522.82 | -4416.45 | 4013.65 | 1626905 | 331609.5 | 392410.2 | 8074913.2 | 5967.78 | 137.736 | 1.83 | 0.03  | 1.83  |
| 12306 | 89.97 | 161.73 | 6392.78 | 5612.82 | -4501.77 | 4044.28 | 1626936 | 331528.6 | 392409.3 | 8074912.9 | 6050.29 | 138.078 | 0.62 | 0.03  | 0.62  |
| 12395 | 89.91 | 160.27 | 6392.85 | 5702.8  | -4585.92 | 4071.26 | 1626962 | 331446.1 | 392408.5 | 8074912.5 | 6132.35 | 138.402 | 1.64 | -0.07 | -1.64 |
| 12485 | 89.82 | 158.99 | 6393.16 | 5791.8  | -4670.29 | 4102.58 | 1626994 | 331364.7 | 392407.7 | 8074912.1 | 6216.33 | 138.703 | 1.43 | -0.1  | -1.42 |
| 12574 | 89.94 | 159.32 | 6393.34 | 5880.79 | -4753.46 | 4134.25 | 1627025 | 331283.6 | 392406.9 | 8074911.7 | 6299.8  | 138.985 | 0.39 | 0.13  | 0.37  |
| 12663 | 90    | 160.12 | 6393.39 | 5970.79 | -4837.88 | 4165.95 | 1627057 | 331202.8 | 392406.1 | 8074911.2 | 6384.05 | 139.271 | 0.89 | 0.07  | 0.89  |
| 12753 | 89.88 | 159.81 | 6393.48 | 6059.79 | -4921.25 | 4195.44 | 1627087 | 331121.5 | 392405.2 | 8074910.8 | 6467.38 | 139.55  | 0.37 | -0.13 | -0.35 |
| 12843 | 89.88 | 159.26 | 6393.67 | 6149.78 | -5005.82 | 4227.4  | 1627118 | 331040.6 | 392404.4 | 8074910.4 | 6552.03 | 139.819 | 0.61 | 0     | -0.61 |
| 12932 | 89.85 | 158.55 | 6393.88 | 6238.77 | -5088.85 | 4259.44 | 1627150 | 330959.2 | 392403.6 | 8074910.0 | 6636.2  | 140.07  | 0.8  | -0.03 | -0.8  |
| 13022 | 90    | 158.54 | 6394    | 6328.74 | -5172.61 | 4292.36 | 1627183 | 330878.4 | 392402.8 | 8074909.6 | 6721.63 | 140.313 | 0.17 | 0.17  | -0.01 |
| 13111 | 89.94 | 158.82 | 6394.05 | 6417.71 | -5255.52 | 4324.71 | 1627216 | 330797.5 | 392402.0 | 8074909.1 | 6806.15 | 140.549 | 0.32 | -0.07 | 0.31  |
| 13201 | 90.06 | 161.81 | 6394.05 | 6507.7  | -5340.25 | 4355.03 | 1627246 | 330716.8 | 392401.1 | 8074908.7 | 6890.9  | 140.802 | 3.32 | 0.13  | 3.32  |
| 13291 | 90.25 | 168.12 | 6393.8  | 6597.32 | -5427.13 | 4378.36 | 1627269 | 330636.9 | 392400.3 | 8074908.4 | 6973.07 | 141.105 | 7.01 | 0.21  | 7.01  |
| 13380 | 90.92 | 165.4  | 6392.89 | 6685.69 | -5513.75 | 4398.74 | 1627290 | 330456.3 | 392399.4 | 8074908.1 | 7053.39 | 141.418 | 3.15 | 0.75  | -3.06 |

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|-------|-------|--------|---------|---------|----------|----------|---------|----------|------------|------------|------------|---------|---------|-------|-------|---|
| 13470 | 90.25 | 159.77 | 6391.97 | 6775.55 | -5599.58 | 4425.67  | 1627317 | 330392.5 | 39°23'58.6 | 80°49'07.8 | 7137.36    | 141.679 | 6.3     | -0.74 | -6.26 |   |
| 13559 | 90.28 | 160.15 | 6391.56 | 6864.55 | -5683.19 | 4456.16  | 1627347 | 330308.9 | 39°23'57.7 | 80°49'07.4 | 7221.92    | 141.9   | 0.43    | 0.03  | 0.43  |   |
| 13649 | 90.28 | 158.79 | 6391.12 | 6954.55 | -5767.48 | 4487.73  | 1627379 | 330224.6 | 39°23'56.9 | 80°49'07.0 | 7307.77    | 142.113 | 1.51    | 0     | -1.51 |   |
| 13739 | 90.34 | 157.91 | 6390.64 | 7044.51 | -5851.12 | 4520.93  | 1627412 | 330141   | 39°23'56.1 | 80°49'06.5 | 7394.22    | 142.308 | 0.98    | 0.07  | -0.98 |   |
| 13828 | 90.34 | 157.14 | 6390.11 | 7133.42 | -5933.36 | 4554.95  | 1627446 | 330058.7 | 39°23'55.3 | 80°49'06.1 | 7480.13    | 142.487 | 0.87    | 0     | -0.87 |   |
| 13918 | 90.46 | 158.71 | 6389.48 | 7223.36 | -6016.76 | 4588.77  | 1627480 | 329975.3 | 39°23'54.5 | 80°49'05.6 | 7566.92    | 142.668 | 1.75    | 0.13  | 1.74  |   |
| 14007 | 90.83 | 162.11 | 6388.48 | 7312.34 | -6100.59 | 4618.61  | 1627510 | 329891.5 | 39°23'53.6 | 80°49'05.2 | 7651.71    | 142.872 | 3.84    | 0.42  | 3.82  |   |
| 14097 | 90.77 | 163.95 | 6387.22 | 7402.2  | -6186.66 | 4644.87  | 1627536 | 329805.4 | 39°23'52.8 | 80°49'04.9 | 7736.25    | 143.101 | 2.05    | -0.07 | 2.04  |   |
| 14187 | 90.46 | 159.79 | 6386.25 | 7492.13 | -6272.17 | 4672.87  | 1627564 | 329719.9 | 39°23'51.9 | 80°49'04.5 | 7821.5     | 143.313 | 4.63    | -0.34 | -4.62 |   |
| 14276 | 90.4  | 159.4  | 6385.59 | 7581.12 | -6355.58 | 4703.9   | 1627595 | 329636.5 | 39°23'51.1 | 80°49'04.1 | 7906.96    | 143.494 | 0.44    | -0.07 | -0.44 |   |
| 14366 | 90.46 | 158.88 | 6384.91 | 7671.11 | -6439.68 | 4735.95  | 1627627 | 329552.4 | 39°23'50.3 | 80°49'03.7 | 7993.66    | 143.668 | 0.58    | 0.07  | -0.58 |   |
| 14456 | 90.43 | 158.9  | 6384.21 | 7761.09 | -6523.64 | 4768.36  | 1627659 | 329468.5 | 39°23'49.5 | 80°49'03.2 | 8080.54    | 143.836 | 0.04    | -0.03 | 0.02  |   |
| 14545 | 89.88 | 158.97 | 6383.97 | 7850.07 | -6606.69 | 4800.35  | 1627691 | 329385.4 | 39°23'48.7 | 80°49'02.8 | 8166.5     | 143.998 | 0.62    | -0.62 | 0.08  |   |
| 14635 | 89.91 | 158.58 | 6384.14 | 7940.05 | -6690.58 | 4832.93  | 1627724 | 329301.5 | 39°23'47.8 | 80°49'02.4 | 8253.55    | 144.158 | 0.43    | 0.03  | -0.43 |   |
| 14724 | 89.94 | 158.72 | 6384.25 | 8029.03 | -6773.47 | 4865.33  | 1627756 | 329218.7 | 39°23'47.0 | 80°49'02.0 | 8339.75    | 144.311 | 0.16    | 0.03  | 0.16  |   |
| 14814 | 90    | 159.57 | 6384.3  | 8119.02 | -6857.58 | 4897.37  | 1627788 | 329134.6 | 39°23'46.2 | 80°49'01.5 | 8426.78    | 144.467 | 0.95    | 0.07  | 0.94  |   |
| 14904 | 90.25 | 159.64 | 6384.1  | 8209.01 | -6941.94 | 4928.74  | 1627820 | 329050.2 | 39°23'45.4 | 80°49'01.1 | 8513.69    | 144.625 | 0.29    | 0.28  | 0.08  |   |
| 14993 | 90.25 | 158.97 | 6383.71 | 8298    | -7025.19 | 4960.19  | 1627851 | 328967   | 39°23'44.5 | 80°49'00.7 | 8599.81    | 144.776 | 0.75    | 0     | -0.75 |   |
| 15083 | 90.22 | 157.86 | 6383.35 | 8387.97 | -7108.88 | 4993.3   | 1627884 | 328883.3 | 39°23'43.7 | 80°49'00.3 | 8687.3     | 144.916 | 1.23    | -0.03 | -1.23 |   |
| 15172 | 89.91 | 157.88 | 6383.24 | 8476.91 | -7191.32 | 5026.82  | 1627918 | 328800.8 | 39°23'42.9 | 80°48'59.8 | 8774.06    | 145.046 | 0.35    | -0.35 | 0.02  |   |
| 15262 | 89.91 | 159.25 | 6383.39 | 8566.88 | -7275.09 | 5059.71  | 1627951 | 328717.1 | 39°23'42.1 | 80°48'59.4 | 8861.59    | 145.182 | 1.52    | 0     | 1.52  |   |
| 15351 | 90.4  | 160.02 | 6383.15 | 8655.87 | -7358.53 | 5090.68  | 1627982 | 328633.6 | 39°23'41.3 | 80°48'59.0 | 8947.79    | 145.324 | 1.03    | 0.55  | 0.87  |   |
| 15441 | 90.74 | 160.76 | 6382.25 | 8745.87 | -7443.31 | 5120.89  | 1628012 | 328548.9 | 39°23'40.4 | 80°48'58.6 | 9034.73    | 145.473 | 0.9     | 0.38  | 0.82  |   |
| 15531 | 90.62 | 160.99 | 6381.18 | 8835.85 | -7528.33 | 5150.37  | 1628041 | 328463.8 | 39°23'39.6 | 80°48'58.2 | 9121.52    | 145.623 | 0.29    | -0.13 | 0.26  |   |
| 15620 | 90.25 | 160.38 | 6380.51 | 8924.84 | -7612.32 | 5179.81  | 1628071 | 328379.9 | 39°23'38.8 | 80°48'57.8 | 9207.49    | 145.767 | 0.8     | -0.42 | -0.69 |   |
| 15710 | 90.12 | 157.87 | 6380.22 | 9014.82 | -7696.4  | 5211.88  | 1628103 | 328295.8 | 39°23'37.9 | 80°48'57.4 | 9295.07    | 145.895 | 2.79    | -0.14 | -2.79 |   |
| 15800 | 89.91 | 158.47 | 6380.19 | 9104.77 | -7779.95 | 5245.34  | 1628136 | 328212.2 | 39°23'37.1 | 80°48'56.9 | 9383.03    | 146.012 | 0.71    | -0.23 | 0.67  |   |
| 15889 | 89.82 | 159.33 | 6380.4  | 9193.76 | -7862.98 | 5277.38  | 1628168 | 328129.2 | 39°23'36.3 | 80°48'56.5 | 9469.81    | 146.132 | 0.97    | -0.1  | 0.97  |   |
| 15979 | 89.91 | 160.1  | 6380.61 | 9283.76 | -7947.4  | 5308.58  | 1628200 | 328044.8 | 39°23'35.5 | 80°48'56.1 | 9557.31    | 146.258 | 0.86    | 0.1   | 0.86  |   |
| 16069 | 89.88 | 160.55 | 6380.78 | 9373.75 | -8032.14 | 5338.89  | 1628230 | 327960.1 | 39°23'34.6 | 80°48'55.7 | 9644.64    | 146.388 | 0.5     | -0.03 | 0.5   |   |
| 16120 | 89.97 | 160.12 | 6380.85 | 9424.75 | -8080.17 | 5356.05  | 1628247 | 327912   | 39°23'34.2 | 80°48'55.5 | 9694.14    | 146.461 | 0.86    | 0.18  | -0.84 |   |
| BHL   | 16145 | 89.97  | 160.12  | 6380.86 | 9449.75  | -8103.68 | 5364.55 | 1628256  | 327888.5   | 39°23'33.9 | 80°48'55.4 | 9718.44 | 146.496 | 0     | 0     | 0 |

**T A R G E T S**

| Name                 | MD [ft] | TVD [ft] | North [ft] | East [ft] | Grid East [US ft] | Grid North [US ft] | Latitude   | Longitude  | Shape   | Comment |
|----------------------|---------|----------|------------|-----------|-------------------|--------------------|------------|------------|---------|---------|
| SHR-40D-HS BHL Rev-1 |         | 6376     | -8106.39   | 5355.76   | 1628247           | 327885.8           | 39°23'33.9 | 80°48'55.5 | point   |         |
| SHR-40D-HS LP Rev-2  |         | 6376     | 21.95      | 2397.28   | 1625288           | 336013.7           | 39°24'53.8 | 80°49'34.7 | point   |         |
| SHR-40 Pad LL        |         | 6599.46  | 50.7       | 31.31     | 1622923           | 336042.5           | 39°24'53.8 | 80°50'04.8 | polygon |         |

**WELLPATH COMPOSITION** Ref Wellbore: SHR-40D-HS AWB Ref Wellpath: SHR-40D-HS AWP Proj: 16145'

| Log Name/  | Start MD [ft] | End MD [ft] | Pos Unc | Model                                  |
|------------|---------------|-------------|---------|--|
| O1_VES Gy  | 19.4          | 2623        |         | Generic gyro - northseeking (Standard) |
| O2_SDI Gyr | 2623          | 6289        |         | Generic gyro - continuous (Standard)   |
| O3_BHI AT  | 6289          | 16120       |         | NaviTrak (AT Curve Short Spaced)       |
| Projection | 16120         | 16145       |         | Blind Drilling (std)                   |

**C O M M E N T S**

Wellpath general comments  
 API: 47-095-02212-0000  
 BHI Job #: 7250516  
 Rig: Precision 542  
 Duration: 5/16/2015-5/23/2015

VES Gyro <8-3/4> (100'-2619)'  
SDI Gyro <8-3/4> (2619)(2663'-6283)'  
BHI AT Curve <8-3/4> (6289)(6350'-16120)'  
Projected MD at TD: 16145'

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# Hydraulic Fracturing Fluid Product Component Information Disclosure

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|                                |                    |
|--------------------------------|--------------------|
| Job Start Date:                | 8/28/2017          |
| Job End Date:                  | 9/5/2017           |
| State:                         | West Virginia      |
| County:                        | Tyler              |
| API Number:                    | 47-095-02212-00-00 |
| Operator Name:                 | CONSOL Energy Inc. |
| Well Name and Number:          | SHRL40DHS          |
| Latitude:                      | 39.41488430        |
| Longitude:                     | -80.83462200       |
| Datum:                         | NAD83              |
| Federal Well:                  | NO                 |
| Indian Well:                   | NO                 |
| True Vertical Depth:           | 6,394              |
| Total Base Water Volume (gal): | 11,444,664         |
| 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                    | Ascent   | Carrier/Base Fluid | Water  | 7732-18-5                                | 100.00000  | 85.51517   | None     |
| Sand (Proppant)          | Keane    | Proppant           | Crystalline silica: Quartz (SiO2)                                      | 14808-60-7                               | 100.00000  | 13.49725   | None     |
| Hydrochloric Acid (7.5%) | Keane    | Acid Inhibitor     | Water  | 7732-18-5                                | 92.50000   | 0.71530  | None     |
|                          |          |                    | Hydrochloric Acid  | 7647-01-0                                | 7.50000  | 0.05800  | None     |
| Hydrochloric Acid (15%)  | Keane    | Acidizing          | Water  | 7732-18-5                                | 85.00000   | 0.09799  | None     |
|                          |          |                    | Hydrochloric Acid  | 7647-01-0                                | 15.00000   | 0.01729  | None     |
| KFR-23                   | Keane    | Friction Reducer   | Distillates (petroleum), hydrotreated light copolymer of 2-propenamide | 64742-47-8                               | 45.00000   | 0.03388  | None     |
|                          |          |                    | Alcohols, C12-16, ethoxylated  | Proprietary                              | 10.00000   | 0.00753  | None     |
|                          |          |                    | oleic acid diethanolamide  | 68551-12-2                               | 2.00000  | 0.00151  | None     |
|                          |          |                    |  | 93-83-4                                  | 2.00000  | 0.00151  | None     |
| KFEAC-30                 | Keane    | Iron Control       |  |  |  |  |          |

|  |              |                        |   |             |          |         |      |
|--|--------------|------------------------|---|-------------|----------|---------|------|
|  |              |                        | acetic acid   | 64-19-7     | 60.00000 | 0.00309 | None |
|  |              |                        | Citric acid   | 77-92-9     | 40.00000 | 0.00206 | None |
| MBC-516  | Keane        | Biocide                |   |             |          |         |      |
|  |              |                        | glutaral  | 111-30-8    | 26.70000 | 0.00233 | None |
|  |              |                        | didecyldimethylammonium chloride                                      | 7173-51-5   | 8.00000  | 0.00069 | None |
|  |              |                        | quaternary ammonium compounds, benzyl-C12-16-alkyldimethyl, chlorides | 68424-85-1  | 5.30000  | 0.00046 | None |
| KSI-19   | Keane        | Scale Inhibitor        |   |             |          |         |      |
|  |              |                        | Methanol  | 67-56-1     | 30.00000 | 0.00244 | None |
| KAI-12   | Keane        | Acid Inhibitor         |   |             |          |         |      |
|  |              |                        | Methanol  | 67-56-1     | 90.00000 | 0.00107 | None |
|  |              |                        | Fatty imidazoline   | 61790-69-0  | 5.00000  | 0.00006 | None |
|  |              |                        | prop-2-yn-1-ol  | 107-19-7    | 5.00000  | 0.00006 | None |
|  |              |                        | Alcohols, C7-9-iso-, C8-rich  | 68526-83-0  | 5.00000  | 0.00006 | None |
|  |              |                        | isopropyl alcohol   | 67-63-0     | 5.00000  | 0.00006 | None |
|  |              |                        | xylene  | 1330-20-7   | 5.00000  | 0.00006 | None |
|  |              |                        | ethylbenzene  | 100-41-4    | 1.00000  | 0.00001 | None |
| KWG-111LS  | Keane        | Gel                    |   |             |          |         |      |
|  |              |                        | Guar gum  | 9000-30-0   | 55.00000 | 0.00028 | None |
|  |              |                        | Distillates (petroleum), hydrotreated light                           | 64742-47-8  | 55.00000 | 0.00028 | None |
| KWBO-2   | Keane        | Breaker                |   |             |          |         |      |
|  |              |                        | Sodium persulfate   | 7775-27-1   | 99.00000 | 0.00001 | 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. |              |                        |   |             |          |         |      |
| Other Chemical(s)  | Listed Above | See Trade Name(s) List |   |             |          |         |      |
|  |              |                        | Water   | 7732-18-5   | 92.50000 | 0.71530 |      |
|  |              |                        | Water   | 7732-18-5   | 85.00000 | 0.09799 |      |
|  |              |                        | copolymer of 2-propenamide  | Proprietary | 10.00000 | 0.00753 |      |
|  |              |                        | Citric acid   | 77-92-9     | 40.00000 | 0.00206 |      |
|  |              |                        | oleic acid diethanolamide   | 93-83-4     | 2.00000  | 0.00151 |      |
|  |              |                        | Alcohols, C12-16, ethoxylated   | 68551-12-2  | 2.00000  | 0.00151 |      |
|  |              |                        | didecyldimethylammonium chloride                                      | 7173-51-5   | 8.00000  | 0.00069 |      |
|  |              |                        | quaternary ammonium compounds, benzyl-C12-16-alkyldimethyl, chlorides | 68424-85-1  | 5.30000  | 0.00046 |      |
|  |              |                        | Distillates (petroleum), hydrotreated light                           | 64742-47-8  | 55.00000 | 0.00028 |      |
|  |              |                        | isopropyl alcohol   | 67-63-0     | 5.00000  | 0.00006 |      |
|  |              |                        | Alcohols, C7-9-iso-, C8-rich  | 68526-83-0  | 5.00000  | 0.00006 |      |
|  |              |                        | Fatty imidazoline   | 61790-69-0  | 5.00000  | 0.00006 |      |
|  |              |                        | xylene  | 1330-20-7   | 5.00000  | 0.00006 |      |
|  |              |                        | prop-2-yn-1-ol  | 107-19-7    | 5.00000  | 0.00006 |      |
|  |              |                        | ethylbenzene  | 100-41-4    | 1.00000  | 0.00001 |      |

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\* 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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(-) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS

WVDEP  
OFFICE OF OIL & GAS  
601 57TH STREET  
CHARLESTON, WV 25304



DATE: SEPTEMBER 4, 2014, OCTOBER 27, 2017

OPERATOR'S WELL #: SHR 40 DHS

API WELL # 47 STATE 095 COUNTY PERMIT 2212

WELL TYPE:  Oil  Gas  Liquid Injection  Storage  Shallow  Deep

WATERSHED: MIDDLE ISLAND CREEK  
COUNTY/DISTRICT: CENTERVILLE / TYLER  
SURFACE OWNER: NOBLE ENERGY, INC  
OIL & GAS ROYALTY OWNER: DAVID L. MAPLE, ET AL

ACREAGE: 543.35  
ACREAGE: 351.16

DESIGNED BY: CHRIS TURNER  
DESIGNATED AGENT: CHRIS TURNER  
ADDRESS: 1 DOMINION DRIVE  
CITY: JANE LEW STATE WV ZIP CODE 26378

TARGET FORMATION: MARCELLUS  
WELL OPERATOR: CNX GAS COMPANY, LLC  
ADDRESS: 1000 CONSOL ENERGY DRIVE, CANNONSBURG, PA 15317  
CITY: CANNONSBURG STATE PA ZIP CODE 15317

ESTIMATED DEPTH: TVD: 6,381' ± TMD: 16,145' ±

DRILL  CONVERT  DRILL DEEPER  REDRILL  FRACTURE OR STIMULATE  PLUG AND ABANDON  PLUG OFF OLD FORMATION  PERFORATE NEW FORMATION  OTHER CHANGE  (SPECIFY)



I, THE UNDERSIGNED, HEREBY CERTIFY THAT THIS PLAN 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 DEPARTMENT OF ENVIRONMENTAL PROTECTION.

SIGNED: *[Signature]*  
R.P.E.: L.L.S.: P.S. NO.

FILE # SHR 40 DHS  
DRAWING # SHR 40 DHS  
SCALE: 1"=2500'  
MINIMUM DEGREE OF ACCURACY: 1/2500'  
PROVEN SOURCE: USGS MONUMENT A 142, 724.61'  
OF ELEVATION

NOTES

- There are no water wells or developed springs within 250' of proposed well
- There are no existing buildings within 625' of proposed well
- Proposed well is greater than 100' from perennial stream, wetland, pond, reservoir or lake
- There are no native trout streams within 300' of proposed well
- Proposed well is greater than 1000' from surface/groundwater intake or public water supply
- It is not the purpose or intention of this plan to represent surveyed locations of the surface or mineral parcels depicted hereon. The location of the boundary lines, as shown, and based on record deed descriptions, field evidence found and/or tax map position, unless otherwise noted.

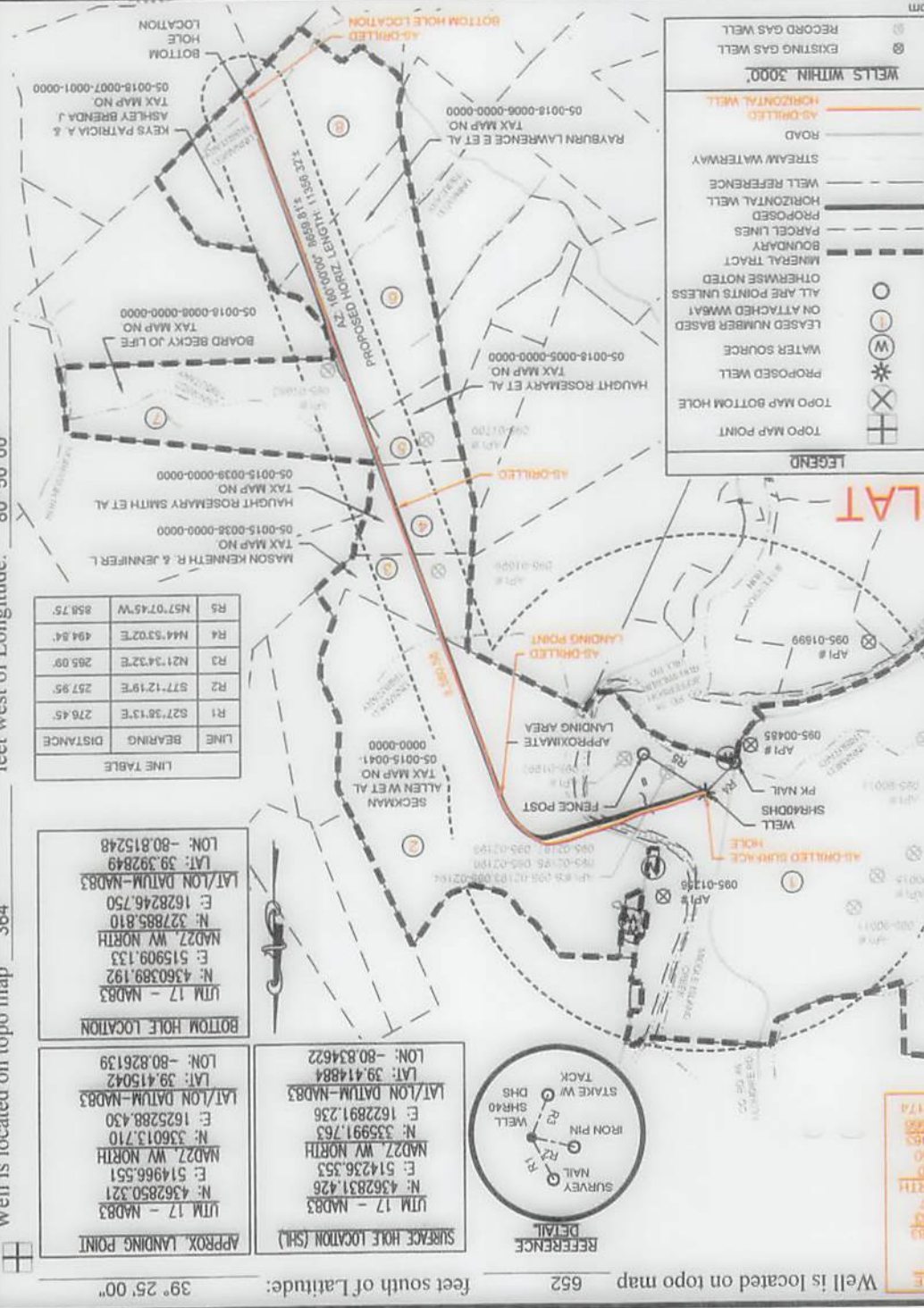
**AS-DRILLED PLAT**

1712 Mount Nebo Road Phone: 412-219-4509  
Sewickley, PA 15143 Email: info@shefferco.com

ENGINEERING & SURVEYING  
**Sheffer & Company, Inc.**

LEGEND

- TOPO MAP POINT
- TOPO MAP BOTTOM HOLE
- PROPOSED WELL
- WATER SOURCE
- LEASED NUMBER BASED ON ATTACHED WMB#1
- ALL ARE POINTS UNLESS OTHERWISE NOTED
- MINERAL TRACT BOUNDARY
- PROPOSED
- HORIZONTAL WELL
- WELL REFERENCE
- STREAM WATERWAY
- ROAD
- AS-DRILLED HORIZONTAL WELL
- EXISTING GAS WELL
- RECORD GAS WELL
- WELLS WITHIN 3000'



Well is located on topo map 364 feet west of Longitude: 80° 50' 00"

Well is located on topo map 652 feet south of Latitude: 39° 25' 00"



Well is located on topo map 8.681 feet south of Latitude: 39° 25' 00"

Well is located on topo map 6.665 feet west of Longitude: 80° 47' 30"

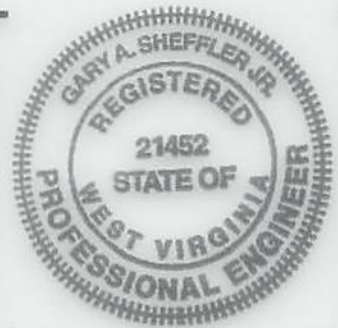


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SIGNED: [Signature]  
R.P.E.: \_\_\_\_\_ L.L.S.: \_\_\_\_\_ P.S. NO. \_\_\_\_\_



(+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS WVDEP OFFICE OF OIL & GAS 601 57TH STREET CHARLESTON, WV 25304



DATE: SEPTEMBER 4, 2014, OCTOBER 27, 2017  
OPERATOR'S WELL #: SHR 40 DHS  
API WELL # 47 095 2212  
STATE COUNTY PERMIT

Well Type:  Oil  Waste Disposal  Production  Deep  
 Gas  Liquid Injection  Storage  Shallow

WATERSHED: MIDDLE ISLAND CREEK ELEVATION: 771'  
COUNTY/DISTRICT: CENTERVILLE / TYLER QUADRANGLE: SHIRLEY, W. VA  
SURFACE OWNER: NOBLE ENERGY, INC ACREAGE: 543.35  
OIL & GAS ROYALTY OWNER: DAVID L. MAPLE, ET AL. ACREAGE: 351.16

DRILL  CONVERT  DRILL DEEPER  REDRILL  FRACTURE OR STIMULATE   
PLUG OFF OLD FORMATION  PERFORATE NEW FORMATION  PLUG AND ABANDON   
CLEAN OUT & REPLUG  OTHER CHANGE  (SPECIFY)

TARGET FORMATION: MARCELLUS ESTIMATED DEPTH: TVD: 6,381' ± TMD: 16,145' ±  
WELL OPERATOR: CNX GAS COMPANY, LLC DESIGNATED AGENT: CHRIS TURNER  
Address: 1000 CONSOL ENERGY DRIVE, CANNONSBURG, PA 15317 Address: 1 DOMINION DRIVE  
City CANONSBURG State PA Zip Code 15317 City JANE LEW State WV Zip Code 26378