JK

WR-35
Rev (1-10)

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

DATE: 3/18/2010
API #: 47-033-05305

Farm name: Male, Kimberly A. Operator Well No.: Payne Unit 1H

LOCATION: Elevation: 1217' Quadrangle: Wolf Summit

District: Coal County: Harrison
Latitude: 10 017' Feet South of 39 Deg. 20 Min. 00 Sec.
Longitude 12,551' Feet West of 80 Deg. 22 Min. 30 Sec.

Company: Antero Resources Appalachian Corporation

Address: 1625 17th Street	Casing & Tubing	Used in drilling	Left in well	Cement fill up Cu. Ft.
Denver, CO 80202	20" 94#	66'	66'	63 Cu. Ft.
	13-3/8" 48#	927'	927'	1251 Cu. Ft.
Agent: CT Corporation System	9-5/8" 36#	2448'	2448'	997 Cu. Ft.
Inspector: Tim Bennett	5-1/2" 20#	14,053'	14,053'	2208 Cu. Ft.
Date Permit Issued: 8/24/2009				
Date Well Work Commenced: 8/27/2009	2-3/8" 4.7#	7221'		
Date Well Work Completed: 10/22/2009				
Verbal Plugging: N/A				
Date Permission granted on:				
Rotary X Cable Rig				
Total Vertical Depth (ft): 7046' TVD (deepest point in well)				
Total Measured Depth (ft): 14,053' MD 7030' TVD (BHL)				
Fresh Water Depth (ft.): N/A				
Salt Water Depth (ft.): N/A				
Is coal being mined in area (N/Y)? N				
Coal Depths (ft.): N/A				

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OPEN FLOW DATA (If more than two producing formations please include additional data on separate sheet)
Producing formation Marcellus Pay zone depth (ft) 7009' TVD (Top)
Gas: Initial open flow 0 MCF/d Oil: Initial open flow N/A Bbl/d
Final open flow 9848 MCF/d Final open flow N/A Bbl/d
Time of open flow between initial and final tests 149 Hours
Static rock Pressure 2700 psig (surface pressure) after _____ Hours

Second producing formation _____ Pay zone depth (ft) _____
Gas: Initial open flow _____ MCF/d Oil: Initial open flow _____ Bbl/d
Final open flow _____ MCF/d Final open flow _____ Bbl/d
Time of open flow between initial and final tests _____ Hours
Static rock Pressure _____ psig (surface pressure) after _____ Hours

I certify under penalty of law that I have personally examined and am familiar with the information submitted on this document and all the attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information I believe that the information is true, accurate, and complete.

Ashli Mihalcin
Signature

3/18/2010
Date

33-05305

NOTE: IN THE AREA BELOW PUT THE FOLLOWING: 1). DETAILS OF PERFORATED INTERVALS, FRACTURING OR STIMULATING, PHYSICAL CHANGE, ETC. 2). THE WELL LOG WHICH IS A SYSTEMATIC DETAILED GEOLOGICAL RECORD OF THE TOPS AND BOTTOMS OF ALL FORMATIONS, INCLUDING COAL ENCOUNTERED BY THE WELLBORE FROM SURFACE TO TOTAL DEPTH.

Perforated Intervals, Fracturing, or Stimulating:

Perforations: 7,500' – 13,992' MD (900 holes)

Frac'd w/13,000 gals 15% HCl Acid, 117,715 bbls Slick Water carrying 538,384# 100 mesh, 2,386,499# 40/70 and 1,562,354# 20/40 sand.

Formations Encountered: Surface:	Top Depth /	Bottom Depth
Sycamore	6388'	6789'
Tully	6790'	7008'
Marcellus	7009'	7046' TVD

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

DATE: 8/23/2010
API #: 47-033-05363

Farm name: Edgar H. Williams Estate Operator Well No.: Southern Unit 1H

LOCATION: Elevation: 1191' Quadrangle: Wolf Summit

District: Coal County: Harrison
Latitude: 8726' Feet South of 39 Deg. 20 Min. 00 Sec.
Longitude 9164' Feet West of 80 Deg. 22 Min. 30 Sec.

Company: Antero Resources Appalachian Corporation

Address: 1625 17th Street	Casing & Tubing	Used in drilling	Left in well	Cement fill up Cu. Ft.
Denver, CO 80202	20" 94#	40'	40'	38 Cu. Ft.
	13-3/8" 48#	934'	934'	1224 Cu. Ft.
Agent: CT Corporation System	9-5/8" 36#	2447'	2447'	979 Cu. Ft.
Inspector: Tim Bennett	5-1/2" 20#	16,606'	16,606'	4316 Cu. Ft.
Date Permit Issued: 12/01/2009				
Date Well Work Commenced: 1/13/2010	2-3/8" 4.7#	7132'		
Date Well Work Completed: 5/05/2010				
Verbal Plugging: N/A				
Date Permission granted on:				
Rotary X Cable Rig				
Total Vertical Depth (ft): 7177' TVD (deepest point in well)				
Total Measured Depth (ft): 16,606' MD, 7177' TVD (BHL)				
Fresh Water Depth (ft.): N/A				
Salt Water Depth (ft.): N/A				
Is coal being mined in area (N/Y)? N				
Coal Depths (ft.): N/A				

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OPEN FLOW DATA (If more than two producing formations please include additional data on separate sheet)
Producing formation Marcellus Pay zone depth (ft) 6977' TVD (Top)
Gas: Initial open flow 0 MCF/d Oil: Initial open flow N/A Bbl/d
Final open flow 17,809 MCF/d Final open flow N/A Bbl/d
Time of open flow between initial and final tests 79 Hours
Static rock Pressure 4000 psig (surface pressure) after _____ Hours

Second producing formation_____ Pay zone depth (ft)_____
Gas: Initial open flow_____ MCF/d Oil: Initial open flow_____ Bbl/d
Final open flow_____ MCF/d Final open flow _____ Bbl/d
Time of open flow between initial and final tests_____ Hours
Static rock Pressure_____ psig (surface pressure) after _____ Hours

I certify under penalty of law that I have personally examined and am familiar with the information submitted on this document and all the attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information I believe that the information is true, accurate, and complete.

Ashlee Mihalcin
Signature

8/23/2010
Date

33.05363

NOTE: IN THE AREA BELOW PUT THE FOLLOWING: 1). DETAILS OF PERFORATED INTERVALS, FRACTURING OR STIMULATING, PHYSICAL CHANGE, ETC. 2). THE WELL LOG WHICH IS A SYSTEMATIC DETAILED GEOLOGICAL RECORD OF THE TOPS AND BOTTOMS OF ALL FORMATIONS, INCLUDING COAL ENCOUNTERED BY THE WELLBORE FROM SURFACE TO TOTAL DEPTH.

Perforated Intervals, Fracturing, or Stimulating:

Perforations: 7678' – 16,545' MD (1512 holes)

Frac'd w/8,354 gals 15% HCl Acid, 198,595 bbls Slick Water carrying 784,711# 100 mesh, 3,830,255# 40/70 sand and 2,173,100# 20/40 sand.

Formations Encountered: Surface:	Top Depth /	Bottom Depth
Sycamore	6291'	6731'
Burkett	6732'	6758'
Tully	6759'	6887'
Hamilton	6888'	6976'
Marcellus	6977'	7177' TVD

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

API 47- 39 - 2727 W County Kanawha District Union
Quad Pocatalico Pad Name _____ Field/Pool Name W. H. Lawrence
Farm name Mary Lee Lawrence Well Number #1
Operator (as registered with the OOG) Shale Gas Production LLC
Address 929 Charleston Road City Spencer State WV Zip 25276

As Drilled location NAD 83/UTM Attach an as-drilled plat, profile view, and deviation survey
Top hole Northing 4254129 Easting 0439839
Landing Point of Curve Northing _____ Easting _____
Bottom Hole Northing _____ Easting _____

Elevation (ft) 936 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)
N/A

Date permit issued 5/15/2014 Date drilling commenced 12/31/1975 6/3/2014 Date drilling ceased 1/24/1976 6/10/2014
Date completion activities began 1/26/1976 6/19/2014 Date completion activities ceased 1/26/1976 6/19/2014
Verbal plugging (Y/N) No 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 110 FT Open mine(s) (Y/N) depths No
Salt water depth(s) ft 1485 FT Void(s) encountered (Y/N) depths No
Coal depth(s) ft 635 FT Cavern(s) encountered (Y/N) depths No
Is coal being mined in area (Y/N) No

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R.F.

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API 47- 39 - 2727 W Farm name Mary Lee Lawrence Well number W.H. Lawrence #1

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							
Surface	N/A	9 5/8"	234	existing	32 #	N/A	Existing casing
Coal							
Intermediate 1	N/A	7"	2505	existing	20 #	N/A	Existing casing
Intermediate 2							
Intermediate 3							
Production	6 1/4"	4 1/2"	4214	New	11.6 #	N/A	Yes, 1/2 BBL
Tubing	N/A	2 3/8"	4290	existing	4.6 #	N/A	Existing Tubing
Packer type and depth set							

Comment Details Clean existing hole out to a T.D. of 4290 FT, and install 4 1/2" production casing.

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	N/A	80	N/A	N/A	N/A	CTS	N/A
Coal							
Intermediate 1	N/A	150	N/A	N/A	N/A	CTS	N/A
Intermediate 2							
Intermediate 3							
Production	Strong Lite 250	125	12.5	2.21	276	2305	24 hrs
Tubing							

Drillers TD (ft) 4290 FT Loggers TD (ft) 4210 FT
Deepest formation penetrated Lower Huron Plug back to (ft)
Plug back procedure

Kick off depth (ft)

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
9 5/8" N/A
7" N/A
4 1/2" N/A

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

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API 47- 39 - 2727 W Farm name Mary Lee Lawrence Well number W.H. Lawrence #1

PERFORATION RECORD

Stage No.	Perforation date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formation(s)
1	6/19/2014	4195	3783	30	Gray, Brown, Gray, Black, & Gray Shale
2	6/19/2014	3750	3286	30	Brown Shale

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 (bbls)	Amount of Nitrogen/other (units)
							7½% HCL	
1	7/8/14	32	3649	3766	3418		525 gallons	801511 N2
2	7/8/14	39.4	3795	4133	3361		925 gallons	800970 N2

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Please insert additional pages as applicable.

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API 47- 39 - 2727 W Farm name Mary Lee Lawrence Well number W.H. Lawrence #1

PRODUCING FORMATION(S)	DEPTHS	
Brown Shale	TVD	3286 - 3750 MD
Gray Shale		3750 - 3810
Brown Shale		3810 - 3825
Gray Shale		3825 - 3900
Black Shale		3900 - 3905
Gray Shale		3905 - 4290

Please insert additional pages as applicable.

GAS TEST ☐ Build up ☐ Drawdown ☒ Open Flow OIL TEST ☐ Flow ☐ Pump

SHUT-IN PRESSURE Surface _____ psi Bottom Hole 530 psi DURATION OF TEST 24 hrs

OPEN FLOW Gas 189 mcfpd Oil _____ bpd NGL _____ bpd Water _____ bpd GAS MEASURED BY ☐ Estimated ☒ Orifice ☐ Pilot

LITHOLOGY/ FORMATION NAME	TOP DEPTH IN FT TVD	BOTTOM DEPTH IN FT TVD	TOP DEPTH IN FT MD	BOTTOM DEPTH IN FT MD	DESCRIBE ROCK TYPE AND RECORD QUANTITY AND TYPE OF FLUID (FRESHWATER, BRINE, OIL, GAS, H_2S, ETC)
	0		0		
					see attachment A.

Please insert additional pages as applicable.

Drilling Contractor Kanawha Valley Drilling
Address 929 Charleston Road City Spencer State WV Zip 25276

Logging Company Nabors Completion & Production Services
Address 515 West Greens Road, Suite 100 City Houston State TX Zip 77067

Cementing Company Universal Well Services
Address Rt 5 Hall Road City Buckhannon State WV Zip 26201

Stimulating Company Universal Well Services
Address Rt 5 Hall Road City Buckhannon State WV Zip 26201

Please insert additional pages as applicable.

Completed by Ryan Fields Telephone 304-927-5228
Signature Ryan Fields Title office assistant Date 9/10/2014

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

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Formation	TOP (TVD)	BOTTOM (TVD)	TOP (MD)	BOTTOM (MD)	Remarks
Top Soil			0	10	
Red Clay			10	90	
Gray Soap Stone			90	200	
Red Rock			200	375	
Gray Soap Stone			375	575	water
Sand			575	600	
Red Rock			600	635	
Coal			635	638	
Red Rock			638	955	
Gas Sand			955	1015	gas (small show)
Sand			1015	1225	
Little Injun			1225	1235	gas & water
Salt Sand			1235	1330	
Sand / Slate			1330	1385	
Sand			1385	1575	
Dark Sand			1575	1600	
Shale			1600	1720	
Sand			1720	1785	
Sand / Little Lime			1785	1840	
Big Lime			1840	1960	
Big Injun			1960	2010	
Dark Sand			2010	2115	
Gray Shale			2115	2150	
Gray Slate			2150	2195	
Shell			2195	2415	
Shale			2415	2438	
Berea			2438	2451	
Dark Shell			2451	2530	
White Sand			2530	2775	
Gordon			2775	2815	gas
Gray Shale			2815	3130	
Brown Shale			3130	3200	gas
Gray Shale			3200	3280	
Brown Shale			3280	3750	
Gray Shale			3750	3810	
Brown Shale			3810	3825	gas
Gray Shale			3825	3900	
Black Shale			3900	3905	
Gray Shale			3905	4290	

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

API 47- 039 - 06327 County Kanawha District Elk
Quad Big Chimney Pad Name _____ Field/Pool Name Yeager
Farm name Central WV Regional Airport Well Number #2
Operator (as registered with the OOG) Reserve Oil and Gas, Inc.
Address 929 Charleston Road City Spencer State WV Zip 25276

As Drilled location NAD 83/UTM Attach an as-drilled plat, profile view, and deviation survey
Top hole Northing 4248087.70 Easting 448052.12
Landing Point of Curve Northing _____ Easting _____
Bottom Hole Northing _____ Easting _____

Elevation (ft) 785 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)
N/A

Date permit issued 12/19/2011 4/28/2014 Date drilling commenced 6/6/2014 08/27/2013 Date drilling ceased 6/6/2014 09/06/2013
Date completion activities began 6/19/2014 Date completion activities ceased 6/19/2014
Verbal plugging (Y/N) No 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 N/A Open mine(s) (Y/N) depths No
Salt water depth(s) ft 768 , 1011 Void(s) encountered (Y/N) depths No
Coal depth(s) ft 1062 - 1065 Cavern(s) encountered (Y/N) depths No
Is coal being mined in area (Y/N) NO

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Reviewed by:
R.F.

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API 47- 039 - 06327 Farm name Central WV Regional Airport Well number Yeager #2

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	17 1/2"	13 3/8"	18 FT	New	48 #	none	CTS by hand
Surface	12 1/4"	9 5/8"	336 FT	New	26 #	1684 FT	Yes, 5bbl to pit
Coal							
Intermediate 1	8 3/4"	7"	1646 FT	New	17 #	1295 FT	Yes, 5bbl to pit
Intermediate 2							
Intermediate 3							
Production	6 1/2"	4 1/2"	4314.30 FT	New	11.6 #	jts: 11, 21, 31,	
Tubing						41, & 51	
Packer type and depth set							

Comment Details Ran 4 1/2" production casing into existing hole, and cement into place.

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	Portland	7				GL	7
Surface	Type 1	120	14.8	1.4	168	GL	13
Coal							
Intermediate 1	Type 1	225	14.8	1.4	315	GL	16
Intermediate 2							
Intermediate 3							
Production	Stringlite 250	160	12.5	2.21	354		24
Tubing							

Drillers TD (ft) 4326 Loggers TD (ft) 4336
Deepest formation penetrated Devonian Shale Plug back to (ft)
Plug back procedure

Kick off depth (ft)

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
13 3/8": no centralizers used
9 5/8": 1 centralizer at joint 6
7": 3 centralizers at joints: 10, 20, 34
4 1/2": 6 centralizers at joints: 10, 20, 30, 40, 50, & 60

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

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API 47- 039 - 06327 Farm name Central WV Regional Airport Well number Yeager #2

PERFORATION RECORD

Stage No.	Perforation date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formation(s)
1	6/19/2014	4170	3458	40	Huron, Devonian Shale
2	6/19/2014	3376	2536	40	Huron

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 (bbls) 7½% HCL	Amount of Nitrogen/other (units)
1	6/19/14	52.526	2470	4407	1883		390 gallons	1000189 N2
2	6/19/14	51.818	2143	2346	1673		1005 gallons	1000189 N2

Please insert additional pages as applicable.

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API 47- 039 - 06327 Farm name Central Regional Airport Well number Yeager #2

PRODUCING FORMATION(S)	DEPTHS	
Huron	2529 - 3663 TVD	2536 - 3670 MD
Devonian Shale	3663 - 4163	3670 - 4170

Please insert additional pages as applicable.

GAS TEST ☐ Build up ☐ Drawdown ☒ Open Flow OIL TEST ☐ Flow ☐ Pump

SHUT-IN PRESSURE Surface _____ psi Bottom Hole 180 psi DURATION OF TEST 7 hrs

OPEN FLOW Gas 84 mcfpd Oil _____ bpd NGL _____ bpd Water _____ bpd GAS MEASURED BY ☐ Estimated ☐ Orifice ☐ Pilot

LITHOLOGY/ FORMATION NAME	TOP DEPTH IN FT TVD	BOTTOM DEPTH IN FT TVD	TOP DEPTH IN FT MD	BOTTOM DEPTH IN FT MD	DESCRIBE ROCK TYPE AND RECORD QUANTITY AND TYPE OF FLUID (FRESHWATER, BRINE, OIL, GAS, H_2S, ETC)
	0		0		
					See Attachment A

Please insert additional pages as applicable.

Drilling Contractor Kanawha Valley Drilling
Address 929 Charleston Road City Spencer State WV Zip 25276

Logging Company Alabers Completion & Production Services Co.
Address 515 West Greens Road, Suite 1100 City Houston State TX Zip 77067

Cementing Company Baker Hughes / Universal Well Services
Address 17015 Aldine Westfield Road / Rt 5 Hall Rd City Houston / Buckhannon State TX / WV Zip 77073 / 26201

Stimulating Company Universal Well Services
Address Rt 5 Hall Road City Buckhannon State WV Zip 26201

Please insert additional pages as applicable.

Completed by Ryan Fields Telephone 304-927-5228
Signature Ryan Fields Title office assistant Date 9/10/2014

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

Formation	TOP (TVD)	BOTTOM (TVD)	TOP (MD)	BOTTOM (MD)	Remarks
KB to GL			0	7	768', hole wet
Rock	0	53	7	60	start soap
Sand & Shale	53	108	60	115	pump
Shale	108	208	115	215	
Sand	208	245	215	252	1011', 3" stream
Shale	245	661	252	668	
Salt Sand	661	1055	668	1062	1974', crude oil
Coal	1055	1058	1062	1065	
Shale	1058	1089	1065	1096	2005', gas,
Maxton	1089	1199	1096	1206	4/10th thru 2"
Shale	1199	1209	1206	1216	
Sand	1209	1341	1216	1348	4326', gas,
Little Lime	1341	1372	1348	1379	4/10th thru 2"
Shale	1372	1375	1379	1382	
Big Lime	1375	1558	1382	1565	
Injun	1558	1584	1565	1591	
Squaw	1584	1595	1591	1602	
Shale	1595	2031	1602	2038	
Brea	2031	2043	2038	2050	
Shale	2043	2123	2050	2130	
Huron	2123	3663	2130	3670	
Devonian Shale	3663	4319	3670	4326	

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

API 47 - 051 - 01656 County Marshall District Sandhill
Quad Majorsville Pad Name SHL-26 Field/Pool Name
Farm name Russell Lee and Barbara Ann Bennett Well Number SHL26BHS
Operator (as registered with the OOG) Noble Energy Inc.
Address 333 Technology Drive, Suite 116 City Canonsburg State PA Zip 15317

As Drilled location NAD 83/UTM Attach an as-drilled plat, profile view, and deviation survey

Top hole	Northing	4424882.534034	Easting	538581.10995
Landing Point of Curve	Northing	4425164.726599	Easting	538697.150976
Bottom Hole	Northing	4426959.838266	Easting	537393.251574

Elevation (ft) 1308.39 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)
Synthetic Oil Based

Date permit issued 06/26/2013 Date drilling commenced 09/28/2013 Date drilling ceased 02/07/2014
Date completion activities began 03/27/2014 Date completion activities ceased 6/5/2014
Verbal plugging (Y/N) N Date permission granted _____ Granted by _____

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

RECEIVED
Office of Oil and Gas
SEP 11 2014
WV Department of
Environmental Protection

Freshwater depth(s) ft 198', 300' Open mine(s) (Y/N) depths _____
Salt water depth(s) ft N/A Void(s) encountered (Y/N) depths N
Coal depth(s) ft 761' to 771' Pittsburgh Cavern(s) encountered (Y/N) depths N
Is coal being mined in area (Y/N) Y

Reviewed by:

WR-35
Rev. 8/23/13

API 47- 051 - 01656 Farm name Russell Lee and Barbara Ann Bennett Well number SHL26BHS

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	36	30	40	N	K-55 94#		
Surface	24	20	415.7	N	J-55 94#		Y
Coal	17 1/2	13 3/8	1196	N	J-55 54.5#		Y
Intermediate 1	12 3/8	9 5/8	3218	N	K-55 36#		Y
Intermediate 2							
Intermediate 3							
Production	8 3/4	5 1/2	14672	N	P-110 20#		Y
Tubing							
Packer type and depth set							

Comment Details 2 Baskets on Surface Casing

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	Type 1	490	15.6	1.19	104	0	8
Coal	Type 1	1027	15.6	1.2	223	0	8
Intermediate 1	Class A	1170	16.2	1.09	227	0	14
Intermediate 2							
Intermediate 3							
Production	Class A	2470	14.8	1.25	551	2087	12
Tubing							

Drillers TD (ft) 14,672 ft. Loggers TD (ft) 14590
Deepest formation penetrated Marcellus Plug back to (ft) Not a Pilot Hole
Plug back procedure not a pilot Hole

Kick off depth (ft) 7389

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
4 Centralizers on Surface casing. 10 Centralizers on Coal casing. 38 Centralizers on Intermediate casing. 234 Centralizers on Production casing.
On the Surface, Coal, and Intermediate Strings, the centralizers are on every 3 joint of casing.
On the Production String, they are on every 3rd from Surface to Top of Curve, then every joint until TD.

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

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API 47- 051 - 01656 Farm name Russell Lee and Barbara Ann Bennett Well number SHL26BHS

PERFORATION RECORD

Stage No.	Perforation date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formation(s)

PLEASE SEE ATTACHED PERFORATION RECORD

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 (bbls)	Amount of Nitrogen/other (units)

PLEASE SEE ATTACHED STIMULATION INFORMATION PER STAGE SHEET

Please insert additional pages as applicable.

Perforation Record

API: 47-051-01656 Farm name: Russell Lee and Barbara Ann Bennett Well Name: SHL-26B-HS

Stage No.	Stim Date	Top Perf	Bottom Perf	# of Perfs	Formation
TOE SLEEVE	3/7/2014	14585	14,587		Marcellus
1	3/18/2014	14426	14,520	48	Marcellus
2	3/27/2014	14275	14,377	40	Marcellus
3	3/28/2014	14125	14,227	40	Marcellus
4	3/28/2014	13975	14,077	40	Marcellus
5	3/29/2014	13825	13,927	40	Marcellus
6	3/30/2014	13675	13,777	40	Marcellus
7	3/30/2014	13525	13,627	40	Marcellus
8	3/31/2014	13375	13,477	40	Marcellus
9	4/1/2014	13225	13,327	40	Marcellus
10	4/1/2014	13075	13,177	40	Marcellus
11	4/1/2014	12925	13,027	40	Marcellus
12	4/1/2014	12775	12,877	40	Marcellus
13	4/2/2014	12625	12,727	40	Marcellus
14	4/2/2014	12475	12,577	40	Marcellus
15	4/3/2014	12325	12,427	40	Marcellus
16	4/3/2014	12175	12,277	40	Marcellus
17	4/4/2014	12025	12,127	40	Marcellus
18	4/4/2014	11875	11,977	40	Marcellus
19	4/7/2014	11725	11,827	40	Marcellus
20	4/8/2014	11575	11,677	40	Marcellus
21	4/8/2014	11425	11,527	40	Marcellus
22	4/9/2014	11275	11,377	40	Marcellus
23	4/9/2014	11125	11,227	40	Marcellus
24	4/9/2014	10975	11,077	40	Marcellus
24 REPERF	4/9/2014	10984	11,018	32	Marcellus
24C	4/10/2014	10825	10,927	40	Marcellus
25	4/10/2014	10675	10,777	40	Marcellus
26	4/10/2014	10525	10,627	40	Marcellus
27	4/11/2014	10375	10,477	40	Marcellus
28	4/12/2014	10225	10,327	40	Marcellus
29	4/12/2014	10075	10,177	40	Marcellus
30	4/12/2014	9925	10,027	40	Marcellus
31	4/13/2014	9775	9,877	40	Marcellus
31C	4/14/2014	9615	9,715	40	Marcellus
32	4/15/2014	9475	9,577	40	Marcellus
32C	4/16/2014	9325	9,427	40	Marcellus
33	4/16/2014	9175	9,277	60	Marcellus
34	4/16/2014	9025	9,127	40	Marcellus
34 REPERF	4/17/2014	9013	9,096	40	Marcellus
35	4/17/2014	8875	8,977	48	Marcellus

Perforation Record

API: 47-051-01656 Farm name: Russell Lee and Barbara Ann Bennett Well Name: SHL-26B-HS

Stage No.	Stim Date	Top Perf	Bottom Perf	# of Perfs	Formation
36	4/18/2014	8725	8,827	48	Marcellus
37	4/18/2014	8575	8,677	48	Marcellus
38	4/18/2014	8425	8,527	48	Marcellus
39	4/19/2014	8275	8,377	48	Marcellus
40	4/19/2014	8125	8,227	48	Marcellus
41	4/20/2014	7975	8,077	48	Marcellus
42	4/20/2014	7825	7,927	48	Marcellus
43	4/21/2014	7675	7,777	48	Marcellus
44	4/21/2014	7525	7,627	48	Marcellus
45	4/22/2014	7375	7,477	48	Marcellus

STIMULATION INFORMATION PER STAGE

API: 47-051-01656 Farm name: Russell Lee and Barbara Ann Bennett Well Name: SHL-26B-HS

Stage No.	Stim Date	Avg Rate (bpm)	ATP (psi)	Max BD Pressure	ISIP (psi)	Proppant (lbs)	Water (BBLS)	Amount of N^2/ other
1 INJ TEST	3/18/2014	17.6	7,086		4,816	-	380.50	
1	3/27/2014	88.9	7,635	-	3,395	301,005	6,951.25	
2	3/27/2014	88.1	7,801	5,874	4,157	305,435	7,125.50	
3	3/28/2014	88.2	8,029	6,305	4,002	303,488	7,025.78	
4	3/28/2014	87.5	7,891	5,885	4,736	295,814	6,961.67	
5	3/29/2014	85.8	7,640	5,800	4,125	295,117	6,792.69	
6	3/30/2014	89.1	7,866	5,933	4,556	303,052	7,261.83	
7	3/30/2014	88.8	7,926	5,723	4,205	295,977	7,007.75	
8	3/31/2014	86.6	7,808	5,863	4,126	292,414	6,917.99	
9	3/31/2014	88.4	7,954	6,712	4,069	302,263	7,480.98	
10	3/31/2014	87.4	8,149	5,871	4,316	302,308	7,256.86	
11	4/1/2014	88.6	8,227	6,531	4,095	302,482	6,649.17	
12	4/1/2014	82.2	8,118	5,276	4,255	301,120	8,488.91	
13	4/2/2014	88.6	8,078	5,455	4,541	304,022	6,605.40	
14	4/2/2014	86.2	8,015	5,545	4,330	299,894	7,390.79	
15	4/3/2014	87.6	8,150	5,720	4,100	300,092	7,991.00	
16	4/3/2014	81.7	8,152	5,482	4,170	302,067	9,561.14	
17	4/4/2014	86.8	8,064	5,233	4,640	300,446	7,457.36	
18	4/5/2014	86.8	8,166	5,422	6,096	262,362	6,589.86	
18 Inj Test	4/7/2014	6	9,636		-		1,058.98	
19	4/7/2014	85.2	8,081	5,592	4,096	304,900	8,268.12	
20	4/8/2014	84.7	8,289	5,636	4,229	300,488	9,411.76	
21	4/8/2014	88.3	8,063	6,122	4,229	302,426	6,818.66	
22	4/9/2014	88.6	7,617	5,529	4,557	302,024	6,653.32	
23	4/9/2014	88.6	8,103	5,947	4,216	302,198	6,623.57	
24	4/9/2014	49	8,469	5,515	4,583	5,915	4,262.73	
24 REPERF	4/10/2014	13	8,176	6,672	5,773	3,764	2,811.15	
24C	4/10/2014	86.2	7,602	6,280	4,064	302,219	6,712.29	
25	4/10/2014	87	7,673	5,885	4,046	301,417	7,050.55	
26	4/11/2014	89.4	7,549	6,032	4,175	296,791	6,352.97	
27	4/11/2014	88.4	7,501	5,876	4,344	301,791	6,569.03	
28	4/12/2014	86.3	7,569	5,990	4,429	297,714	8,035.40	
29	4/12/2014	88.4	7,432	5,666	4,000	302,089	6,530.31	
30	4/13/2014	84.8	7,935	6,120	4,382	300,269	6,673.65	
31A	4/14/2014	61.4	8,516	5,972	4,125	3,543	2,198.04	
31C	4/14/2014	89.4	7,571	6,049	4,231	301,426	6,600.88	
32	4/15/2014	51	8,554	6,672	5,503	72,130	10,923.48	
32B	4/15/2014	22.4	8,598	6,395	5,122	6,592	5,273.11	
32C	4/16/2014	85.8	7,479	5,687	4,211	600,887	11,999.61	
33	4/16/2014	82.2	7,881	5,681	5,448	250,120	8,267.38	
34	4/17/2014	49.5	8,319	6,170	5,582	1,162	4,508.30	

STIMULATION INFORMATION PER STAGE

API: 47-051-01656 Farm name: Russell Lee and Barbara Ann Bennett Well Name: SHL-26B-HS

Stage No.	Stim Date	Avg Rate (bpm)	ATP (psi)	Max BD Pressure	ISIP (psi)	Proppant (lbs)	Water (BBLS)	Amount of N^2/ other
34B	4/17/2014	72	7,733	6,552	6,366	352,485	8,483.26	
35	4/18/2014	89.4	7,571	6,073	4,184	283,834	6,235.38	
36	4/18/2014	86.7	7,341	5,908	3,816	317,788	6,286.60	
37	4/18/2014	89.3	7,388	5,771	4,205	300,407	6,115.04	
38	4/19/2014	87.9	7,169	5,320	4,545	306,860	6,239.30	
39	4/19/2014	89.4	7,191	6,067	4,130	302,082	5,962.79	
40	4/20/2014	89.4	7,084	6,701	4,219	301,242	5,987.66	
41	4/20/2014	83.6	7,496	5,825	4,261	299,181	8,006.63	
42	4/20/2014	88.6	7,696	5,974	4,046	302,434	6,199.21	
43	4/21/2014	88.4	7,489	6,733	4,484	302,594	6,132.93	
44	4/22/2014	86.8	6,829	5,623	4,197	300,632	6,130.60	
45	4/22/2014	87.7	6,964	6,079	4,325	303,277	5,770.51	

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API 47- 051 - 01656 Farm name Russell Lee and Barbara Ann Bennett Well number SHL26BHS

PRODUCING FORMATION(S)	DEPTHS	
Marcellus	6629.4 TVD	14672 MD

Please insert additional pages as applicable.

GAS TEST ☐ Build up ☐ Drawdown ■ Open Flow OIL TEST ☐ Flow ☐ Pump

SHUT-IN PRESSURE Surface _____ psi Bottom Hole _____ psi DURATION OF TEST _____ hrs

OPEN FLOW	Gas	Oil	NGL	Water	GAS MEASURED BY
	2450 mcfpd	74 bpd	111 bpd	1273 bpd	☐ Estimated ■ Orifice ☐ Pilot

LITHOLOGY/ FORMATION NAME	TOP DEPTH IN FT TVD	BOTTOM DEPTH IN FT TVD	TOP DEPTH IN FT MD	BOTTOM DEPTH IN FT MD	DESCRIBE ROCK TYPE AND RECORD QUANTITY AND TYPE OF FLUID (FRESHWATER, BRINE, OIL, GAS, H_2S, ETC)
	0		0		

PLEASE SEE FORMATIONS SHEET

Please insert additional pages as applicable.

Drilling Contractor Nabors Drilling USA, LP
Address 515 West Greens Rd, Suite 1000 City Houston State TX Zip 77067-4525

Logging Company Horizon Well Logging, LLC
Address 7136 S. Yale Ave. Suite 414 City Tulsa State OK Zip 74136

Cementing Company CalFrac
Address 717 17th St., Suite 1445 City Denver State CO Zip 80202

Stimulating Company Halliburton Energy Services
Address 121 Champion Way, Suite 210 City Canonsburg State PA Zip 15317

Please insert additional pages as applicable.

Completed by Dee Swiger Telephone 724-820-3061
Signature [signature] Title Reg. Analyst Date 8/5/14

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

FORMATIONS

API 47-051-5101656 Farm Name Russell Lee and Barbara Ann Bennett Well Name SHL26B

Lithology/Formation	Top Depth in FT TVD	Bottom Depth in FT TVD	Top Depth in Ft MD	Bottom Depth in FT MD	Describe Rock Type and Record Quantity and Type of Fluid (Freshwater, Brine, Oil, Gas, H2S, ETC)
Shale	0	808	0	808	
Pittsburgh Coal	808	817	808	817	
Shale and Sandstone	817	1264	817	1264	
Dunkard Sand	1264	1275	1264	1275	
Shale	1275	1446	1275	1446	
Gas Sand	1446	1485	1446	1485	
Shale	1485	1577	1485	1578	
1st Salt Sand	1577	1601	1578	1602	
Shale	1601	1610	1602	1611	
2nd Salt Sand	1610	1655	1611	1656	
Shale	1655	1738	1656	1739	
Maxton Sand	1738	1750	1739	1751	
Shale	1750	1793	1751	1794	
Big Lime	1793	1873	1794	1875	
Big Injun	1873	2067	1875	2069	
Price	2067	2425	2069	2427	
Murrysville	2425	2439	2427	2441	
Shale	2439	2636	2441	2638	
50' Sand	2636	2638	2638	2640	
Shale	2638	2691	2640	2693	
30' Sand	2691	2700	2693	2702	
Shale	2700	2742	2702	2744	
Gordon Stray	2742	2757	2744	2759	
Shale	2757	2793	2759	2795	
Gordon	2793	2806	2795	2808	
Shale	2806	2902	2808	2904	
Fifth Sand	2902	2936	2904	2938	
Shale	2936	3342	2938	3344	
Speechley Sand	3342	3370	3344	3372	
Shale	3370	4378	3372	4380	
Warren Sand	4378	4387	4380	4389	
Shale	4387	5045	4389	5047	
Java Shale	5045	5216	5047	5218	
Pipe Creek Shale	5216	5273	5218	5275	
Angola Shale	5273	5898	5275	5903	
Rhinestreet	5898	6314	5903	6435	
Cashaqua	6314	6405	6435	6576	
Middlesex	6405	6440	6576	6633	
West River	6440	6492	6633	6726	
Burkett	6492	6515	6726	6770	
Tully Limestone	6515	6545	6770	6832	
Hamilton	6545	6656	6832	7148	
Marcellus	6656	6706	7148	not encountered	Gas

Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date:	3/18/2014
Job End Date:	4/22/2014
State:	West Virginia
County:	Marshall
API Number:	47-051-01656-00-00
Operator Name:	Noble Energy, Inc.
Well Name and Number:	SHL26 B
Longitude:	-80.54840000
Latitude:	39.97314400
Datum:	NAD27
Federal/Tribal Well:	NO
True Vertical Depth:	6,629
Total Base Water Volume (gal):	14,828,013
Total Base Non Water Volume:	0

FracFocus Chemical Disclosure Registry

GROUNDWATER PROTECTION COUNCIL

Oil & Gas

51-01656

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
Fresh Water	Operator	Base Fluid					
			Fresh Water	7732-18-5	100.00000	89.02451	Density = 8.400
SAND - PREMIUM WHITE	Halliburton	Proppant					
			Crystalline silica, quartz	14808-60-7	100.00000	7.77870	
SAND - COMMON WHITE	Halliburton	Proppant					
			Crystalline silica, quartz	14808-60-7	100.00000	1.99840	
HYDROCHLORIC ACID 5-10%	Halliburton	Solvent					
			Hydrochloric acid	7647-01-0	10.00000	0.10744	
FR-66	Halliburton	Friction Reducer					
			Hydrotreated light petroleum distillate	64742-47-8	30.00000	0.01212	
FE-1A ACIDIZING COMPOSITION	Halliburton	Additive					
			Acetic anhydride	108-24-7	100.00000	0.00596	
			Acetic acid	64-19-7	60.00000	0.00357	
FDP-S1078-12	Halliburton	Friction Reducer					
			Hydrotreated light petroleum distillate	64742-47-8	30.00000	0.00347	
			Alcohols, C12-16, ethoxylated	68551-12-2	10.00000	0.00116	

			Ammonium chloride	12125-02-9	10.00000	0.00116	
			9-Octadecenamide, n,n-bis-2 (hydroxy-ethyl)-,(Z)	93-83-4	5.00000	0.00058	
HYDROCHLORIC ACID 10-30%	Halliburton	Solvent					
			Hydrochloric acid	7647-01-0	30.00000	0.00576	
BE-9	Halliburton	Biocide					
			Tributyl tetradecyl phosphonium chloride	81741-28-8	10.00000	0.00384	
LP-65 MC	Halliburton	Scale Inhibitor					
			Ammonium chloride	12125-02-9	10.00000	0.00235	
LOSURF-300 NONIONIC SURFACTANT	Halliburton	Surfactant					
			Isopropanol	67-63-0	60.00000	0.00121	
			Light aromatic solvent	64742-95-6	30.00000	0.00061	
			Ethoxylated nonylphenol	Confidential	10.00000	0.00020	Denise Tuck, Halliburton 3000 N. Sam Houston Pkwy E., Houston, TX 77032 281-871-6226
LGC-36 UC	Halliburton	Liquid Gel Concentrate					
			Guar gum	9000-30-0	60.00000	0.00075	
			Naphtha, hydrotreated heavy	64742-48-9	60.00000	0.00075	
LCA-1	Halliburton	Solvent					
			Paraffinic solvent	Confidential	100.00000	0.00141	
HAI-OS ACID INHIBITOR	Halliburton	Corrosion Inhibitor					
			Methanol	67-56-1	60.00000	0.00057	
			Propargyl alcohol	107-19-7	10.00000	0.00010	
SP BREAKER	Halliburton	Breaker					
			Sodium persulfate	7775-27-1	100.00000	0.00002	
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 Ingredient(s)					
			Water	7732-18-5		1.17377	
		Other Ingredient(s)					
			Organic phosphonate	Confidential		0.01411	
		Other Ingredient(s)					
			Polyacrylamide copolymer	Confidential		0.01212	
		Other Ingredient(s)					
			Polyacrylate	Confidential		0.00347	
		Other Ingredient(s)					
			Inorganic salt	Confidential		0.00347	
		Other Ingredient(s)					
			Sodium chloride	7647-14-5		0.00202	
		Other Ingredient(s)					
			Ammonium chloride	12125-02-9		0.00202	
		Other Ingredient(s)					

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			Alcohols, C12-16, ethoxylated	68551-12-2		0.00202	
		Other Ingredient(s)					
			Fatty acid tall oil amide	Confidential		0.00202	
		Other Ingredient(s)					
			Fatty acid ester	Confidential		0.00058	Denise Tuck, Halliburton 3000 N. Sam Houston Pkwy E., Houston, TX 77032 281-871-6226
		Other Ingredient(s)					
			Sorbitan, mono-9-octadecenoate, (Z)	1338-43-8		0.00040	
		Other Ingredient(s)					
			Sorbitan monooleate polyoxyethylene derivative	9005-65-6		0.00040	
		Other Ingredient(s)					
			Formaldehyde	50-00-0		0.00024	
		Other Ingredient(s)					
			Quaternary ammonium compounds, bis(hydrogenated tallow alkyl) dimethyl,salts with bentonite	68953-58-2		0.00006	
		Other Ingredient(s)					
			Fatty alcohol polyglycol ether surfactant	9043-30-5		0.00001	
		Other Ingredient(s)					
			Crystalline silica, quartz	14808-60-7		0.00000	
		Other Ingredient(s)					
			Sodium sulfate	7757-82-6		0.00000	

* 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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PATHFINDER

noble energy

Noble Energy SHL-26B-HS Gyro+MWD 0ft to 14627ft MD Survey Report

(Def Survey)

Report Date:	February 10, 2014 - 09:17 AM	Survey / DLS Computation:	Minimum Curvature / Lubinski
Client:	Noble Energy	Vertical Section Azimuth:	331.229 ° (Grid North)
Field:	WV Marshall County (NAD 27)	Vertical Section Origin:	0.000 ft, 0.000 ft
Structure / Slot:	Noble Energy SHL-26 Pad / SHL-26B-HS	TVD Reference Datum:	KB
Well:	SHL-26B-HS	TVD Reference Elevation:	1332.180 ft above MSL
Borehole:	Original Borehole	Seabed / Ground Elevation:	1309.180 ft above MSL
UWI / API#:	Unknown / Unknown	Magnetic Declination:	-8.418 °
Survey Name:	Noble Energy SHL-26B-HS Gyro+MWD 0ft to 14627ft MD	Total Gravity Field Strength:	999.3453mgn (9.80665 Based)
Survey Date:	January 22, 2014	Gravity Model:	GARM
Tort / AHD / DDI / ERD Ratio:	220.442 ° / 8574.489 ft / 6.918 / 1.282	Total Magnetic Field Strength:	53112.508 nT
Coordinate Reference System:	NAD27 West Virginia State Plane, Northern Zone, US Feet	Magnetic Dip Angle:	67.500 °
Location Lat / Long:	N 39° 58' 23.31726", W 80° 32' 54.23833"	Declination Date:	January 22, 2014
Location Grid N/E Y/X:	N 538274.492 ftUS, E 1706173.176 ftUS	Magnetic Declination Model:	HDGM 2013
CRS Grid Convergence Angle:	-0.6686 °	North Reference:	Grid North
Grid Scale Factor:	0.99995906	Grid Convergence Used:	-0.6686 °
Version / Patch:	2.7.1043.0	Total Corr Mag North->Grid North:	-7.7489 °
		Local Coord Referenced To:	Well Head

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	TVDSS (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	BR (°/100ft)	TR (°/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ' ")	Longitude (E/W ° ' ")	Directional Difficulty Index
SHL	0.00	0.00	0.00	0.00	-1332.18	0.00	0.00	0.00	N/A	N/A	N/A	538274.49	1706173.18	N 39 58 23.32	W 80 32 54.24	0.00
	123.00	0.13	288.51	123.00	-1209.18	0.10	0.04	-0.13	0.11	0.11	0.00	538274.54	1706173.04	N 39 58 23.32	W 80 32 54.24	0.00
	223.00	0.08	304.42	223.00	-1109.18	0.25	0.12	-0.30	0.06	-0.05	15.91	538274.61	1706172.88	N 39 58 23.32	W 80 32 54.24	0.00
	323.00	0.06	247.40	323.00	-1009.18	0.32	0.14	-0.40	0.07	-0.02	-57.02	538274.63	1706172.77	N 39 58 23.32	W 80 32 54.24	0.00
	423.00	0.15	203.72	423.00	-909.18	0.24	0.00	-0.50	0.11	0.09	-43.68	538274.49	1706172.67	N 39 58 23.32	W 80 32 54.24	0.00
	523.00	0.24	224.29	523.00	-809.18	0.10	-0.27	-0.70	0.11	0.09	20.57	538274.22	1706172.47	N 39 58 23.31	W 80 32 54.25	0.00
	623.00	0.17	213.73	623.00	-709.18	-0.03	-0.54	-0.93	0.08	-0.07	-10.56	538273.95	1706172.24	N 39 58 23.31	W 80 32 54.25	0.00
	723.00	0.24	205.58	723.00	-609.18	-0.22	-0.86	-1.10	0.08	0.07	-8.15	538273.64	1706172.07	N 39 58 23.31	W 80 32 54.25	0.03
	823.00	0.14	251.58	823.00	-509.18	-0.32	-1.08	-1.31	0.17	-0.10	46.00	538273.41	1706171.86	N 39 58 23.31	W 80 32 54.26	0.21
	923.00	0.06	245.72	923.00	-409.18	-0.29	-1.14	-1.47	0.08	-0.08	-5.86	538273.35	1706171.70	N 39 58 23.31	W 80 32 54.26	0.28
	1023.00	0.05	239.29	1023.00	-309.18	-0.29	-1.19	-1.56	0.01	-0.01	-6.43	538273.30	1706171.62	N 39 58 23.31	W 80 32 54.26	0.31
	1123.00	0.08	211.29	1123.00	-209.18	-0.33	-1.27	-1.63	0.04	0.03	-28.00	538273.22	1706171.54	N 39 58 23.30	W 80 32 54.26	0.35
	1158.00	0.04	204.12	1158.00	-174.18	-0.35	-1.30	-1.65	0.12	-0.11	-20.23	538273.19	1706171.52	N 39 58 23.30	W 80 32 54.26	0.37
	1241.00	0.59	1.68	1241.00	-91.18	0.00	-0.90	-1.65	0.76	0.66	189.83	538273.59	1706171.53	N 39 58 23.31	W 80 32 54.26	0.66
	1273.00	0.70	10.12	1272.99	-59.19	0.30	-0.54	-1.61	0.45	0.34	26.38	538273.95	1706171.56	N 39 58 23.31	W 80 32 54.26	0.75
	1305.00	0.95	30.65	1304.99	-27.19	0.59	-0.12	-1.44	1.20	0.78	64.16	538274.37	1706171.73	N 39 58 23.32	W 80 32 54.26	0.89
	1336.00	1.46	46.03	1335.98	3.80	0.82	0.37	-1.03	1.93	1.65	49.61	538274.86	1706172.15	N 39 58 23.32	W 80 32 54.25	1.07
	1368.00	2.07	54.66	1367.97	35.79	0.99	0.99	-0.26	2.07	1.91	26.97	538275.48	1706172.91	N 39 58 23.33	W 80 32 54.24	1.25
	1399.00	2.72	58.36	1398.94	66.76	1.09	1.70	0.82	2.15	2.10	11.94	538276.19	1706174.00	N 39 58 23.33	W 80 32 54.23	1.43
	1431.00	3.31	60.98	1430.90	98.72	1.14	2.55	2.28	1.89	1.84	8.19	538277.04	1706175.45	N 39 58 23.34	W 80 32 54.21	1.59
	1462.00	3.64	62.33	1461.84	129.66	1.12	3.44	3.93	1.10	1.06	4.35	538277.93	1706177.11	N 39 58 23.35	W 80 32 54.19	1.71
	1526.00	5.03	74.71	1525.60	193.48	0.43	5.12	8.44	2.61	2.17	19.34	538279.61	1706181.61	N 39 58 23.37	W 80 32 54.13	2.00
	1620.00	5.32	81.86	1619.27	287.09	-2.07	6.82	16.72	0.75	0.31	7.61	538281.32	1706189.90	N 39 58 23.39	W 80 32 54.02	2.24
	1715.00	4.66	82.23	1713.91	381.73	-5.01	7.97	24.92	0.67	-0.67	0.39	538282.46	1706198.10	N 39 58 23.40	W 80 32 53.92	2.41
	1810.00	4.33	88.62	1808.82	476.44	-8.05	8.58	32.35	0.64	-0.37	6.73	538283.07	1706205.52	N 39 58 23.41	W 80 32 53.82	2.53
	1938.00	3.25	84.65	1936.34	604.16	-11.71	9.04	40.79	0.87	-0.84	-3.10	538283.53	1706213.97	N 39 58 23.41	W 80 32 53.72	2.67
	2033.00	2.06	95.48	2031.23	699.05	-13.74	9.12	45.17	1.35	-1.25	11.40	538283.62	1706218.35	N 39 58 23.41	W 80 32 53.66	2.76
	2128.00	0.81	109.27	2126.20	794.02	-15.20	8.74	47.51	1.36	-1.32	14.52	538283.23	1706220.68	N 39 58 23.41	W 80 32 53.63	2.83
	2222.00	0.87	122.81	2220.19	888.01	-16.33	8.13	48.73	0.22	0.06	14.40	538282.63	1706221.91	N 39 58 23.40	W 80 32 53.61	2.84
	2317.00	0.40	260.93	2315.19	983.01	-16.85	7.69	49.01	1.26	-0.49	145.39	538282.18	1706222.19	N 39 58 23.40	W 80 32 53.61	2.89
	2412.00	0.49	271.86	2410.19	1078.01	-16.53	7.65	48.28	0.13	0.09	11.51	538282.14	1706221.45	N 39 58 23.40	W 80 32 53.62	2.90
	2506.00	0.76	240.20	2504.18	1172.00	-16.34	7.35	47.34	0.46	0.29	-33.68	538281.85	1706220.51	N 39 58 23.40	W 80 32 53.63	2.92
	2601.00	0.42	267.47	2599.18	1267.00	-16.19	7.03	46.44	0.45	-0.36	28.71	538281.52	1706219.62	N 39 58 23.39	W 80 32 53.64	2.94
	2695.00	0.62	237.44	2693.17	1360.99	-16.08	6.74	45.67	0.35	0.21	-31.95	538281.23	1706218.84	N 39 58 23.39	W 80 32 53.65	2.96
	2790.00	0.60	238.92	2788.17	1455.99	-16.13	6.18	44.77	0.05	0.04	1.56	538280.67	1706217.94	N 39 58 23.38	W 80 32 53.66	2.96
	2885.00	0.81	239.68	2883.16	1550.98	-16.17	5.56	43.72	0.16	0.16	0.80	538280.05	1706216.89	N 39 58 23.38	W 80 32 53.68	2.98
	2978.00	0.91	261.42	2976.15	1643.97	-15.93	5.11	42.42	0.36	0.11	23.38	538279.61	1706215.60	N 39 58 23.37	W 80 32 53.69	3.00
	3073.00	1.19	248.77	3071.13	1738.95	-15.54	4.65	40.76	0.38	0.29	-13.32	538279.14	1706213.93	N 39 58 23.37	W 80 32 53.72	3.02
	3167.00	1.23	246.34	3165.11	1832.93	-15.33	3.89	38.92	0.07	0.04	-2.59	538278.38	1706212.10	N 39 58 23.36	W 80 32 53.74	3.03

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Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	TVDSS (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	BR (°/100ft)	TR (°/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ' ")	Longitude (E/W ° ' ")	Directional Difficulty Index
	3190.00	1.33	242.85	3188.11	1855.93	-15.30	3.67	38.46	0.55	0.43	-15.17	538278.16	1706211.63	N 39 58 23.36	W 80 32 53.74	3.04
	3290.00	1.06	215.74	3288.08	1955.90	-16.66	2.39	36.69	0.62	-0.27	-27.11	538276.88	1706210.08	N 39 58 23.35	W 80 32 53.76	3.07
	3385.00	1.44	113.17	3383.07	2050.89	-16.98	1.20	37.47	2.07	0.40	-107.97	538275.89	1706210.64	N 39 58 23.33	W 80 32 53.76	3.13
	3479.00	1.88	98.46	3477.03	2144.85	-18.83	0.51	40.06	0.63	0.46	-15.05	538275.01	1706213.24	N 39 58 23.33	W 80 32 53.72	3.16
	3574.00	1.51	92.56	3571.99	2239.81	-20.42	0.23	42.84	0.41	-0.37	-0.21	538274.72	1706216.01	N 39 58 23.32	W 80 32 53.69	3.16
	3668.00	0.98	93.43	3665.97	2333.79	-21.49	0.13	44.68	0.56	-0.56	0.93	538274.62	1706218.05	N 39 58 23.32	W 80 32 53.66	3.20
	3763.00	0.93	83.17	3760.96	2428.78	-22.21	0.17	46.40	0.19	-0.05	-10.80	538274.66	1706219.63	N 39 58 23.32	W 80 32 53.64	3.22
	3858.00	0.87	89.50	3855.94	2523.76	-22.84	0.27	47.94	0.12	-0.06	6.66	538274.76	1706221.12	N 39 58 23.33	W 80 32 53.62	3.23
	3952.00	0.80	75.05	3949.93	2617.75	-23.34	0.44	49.29	0.24	-0.07	-15.37	538274.94	1706222.46	N 39 58 23.33	W 80 32 53.61	3.24
	4047.00	0.60	43.01	4044.93	2712.75	-23.31	1.03	50.32	0.45	-0.12	-33.73	538275.53	1706223.50	N 39 58 23.33	W 80 32 53.59	3.25
	4142.00	0.59	26.46	4139.92	2807.74	-22.68	1.89	50.93	0.22	-0.11	-17.42	538276.38	1706224.10	N 39 58 23.34	W 80 32 53.58	3.26
	4237.00	0.29	4.29	4234.92	2902.74	-22.38	2.57	51.17	0.36	-0.32	-23.34	538277.06	1706224.34	N 39 58 23.35	W 80 32 53.58	3.27
	4331.00	0.21	352.03	4328.92	2996.74	-22.02	2.97	51.16	0.10	-0.09	-13.04	538277.47	1706224.33	N 39 58 23.35	W 80 32 53.58	3.28
	4426.00	0.34	314.44	4423.92	3091.74	-21.58	3.34	50.93	0.23	0.14	-39.57	538277.84	1706224.11	N 39 58 23.36	W 80 32 53.58	3.28
	4520.00	0.29	309.25	4517.91	3185.73	-21.10	3.69	50.55	0.06	-0.05	-5.52	538278.18	1706223.72	N 39 58 23.36	W 80 32 53.59	3.29
	4615.00	0.45	291.71	4612.91	3280.73	-20.59	3.98	50.02	0.20	0.17	-18.46	538278.47	1706223.19	N 39 58 23.36	W 80 32 53.60	3.29
	4709.00	0.42	280.07	4706.91	3374.73	-20.08	4.18	49.34	0.10	-0.03	-12.38	538278.67	1706222.51	N 39 58 23.36	W 80 32 53.61	3.30
	4804.00	0.52	258.29	4801.91	3469.73	-19.75	4.14	48.57	0.23	0.11	-25.03	538278.63	1706221.75	N 39 58 23.36	W 80 32 53.62	3.31
	4899.00	0.30	240.37	4896.90	3564.72	-19.65	3.91	47.94	0.26	-0.23	-18.76	538278.40	1706221.11	N 39 58 23.36	W 80 32 53.62	3.32
	4993.00	0.19	214.66	4990.90	3658.72	-19.72	3.66	47.64	0.16	-0.12	-27.35	538278.15	1706220.81	N 39 58 23.36	W 80 32 53.63	3.32
	5088.00	0.19	232.70	5085.00	3753.72	-19.81	3.44	47.42	0.06	0.00	18.99	538277.93	1706220.60	N 39 58 23.36	W 80 32 53.63	3.32
	5182.00	0.17	256.09	5179.90	3847.72	-19.80	3.31	47.16	0.08	-0.02	24.88	538277.80	1706220.34	N 39 58 23.36	W 80 32 53.63	3.33
	5277.00	0.28	269.50	5274.90	3942.72	-19.65	3.27	46.79	0.13	0.12	14.12	538277.76	1706219.97	N 39 58 23.35	W 80 32 53.64	3.33
	5372.00	0.28	251.80	5369.90	4037.72	-19.50	3.20	46.34	0.09	0.00	-18.63	538277.69	1706219.52	N 39 58 23.35	W 80 32 53.64	3.33
	5466.00	0.21	248.63	5463.90	4131.72	-19.44	3.06	45.96	0.08	-0.07	-3.37	538277.55	1706219.14	N 39 58 23.35	W 80 32 53.65	3.34
	5561.00	0.21	211.39	5558.90	4226.72	-19.50	2.85	45.71	0.14	0.00	-39.20	538277.34	1706218.88	N 39 58 23.35	W 80 32 53.65	3.34
	5645.00	0.22	241.35	5642.90	4310.72	-19.58	2.64	45.49	0.13	0.01	35.67	538277.13	1706218.66	N 39 58 23.35	W 80 32 53.65	3.34
	5704.00	0.10	46.60	5701.90	4369.72	-19.56	2.62	45.43	0.54	-0.20	280.08	538277.12	1706218.60	N 39 58 23.35	W 80 32 53.66	3.35
	5751.00	3.68	71.54	5748.86	4416.68	-19.84	3.16	46.96	8.06	8.04	53.06	538277.65	1706220.14	N 39 58 23.35	W 80 32 53.64	3.42
	5798.00	8.81	72.40	5795.56	4463.38	-20.82	4.75	51.91	10.49	10.49	1.83	538279.24	1706225.08	N 39 58 23.37	W 80 32 53.57	3.52
	5846.00	12.31	72.43	5842.74	4510.56	-22.53	7.40	60.29	7.29	7.29	0.06	538281.90	1706233.46	N 39 58 23.40	W 80 32 53.47	3.60
	5893.00	15.42	70.57	5888.36	4556.18	-24.52	11.00	70.96	6.68	6.62	-3.96	538285.49	1706244.14	N 39 58 23.43	W 80 32 53.33	3.68
	5940.00	18.82	68.82	5933.27	4601.09	-26.53	15.82	83.93	7.32	7.23	-3.72	538290.31	1706257.10	N 39 58 23.48	W 80 32 53.16	3.70
	5987.00	22.28	71.10	5977.28	4645.10	-29.06	21.44	99.43	7.55	7.36	4.85	538295.93	1706272.60	N 39 58 23.54	W 80 32 52.96	3.84
	6035.00	26.20	70.57	6021.02	4688.84	-32.35	27.93	118.07	8.37	8.35	-1.10	538302.42	1706291.24	N 39 58 23.61	W 80 32 52.73	3.93
	6082.00	30.40	70.35	6062.38	4730.20	-35.92	35.39	139.10	8.75	8.74	-0.47	538309.88	1706312.27	N 39 58 23.68	W 80 32 52.46	4.02
	6129.00	34.71	71.10	6101.98	4769.80	-40.11	43.73	162.97	9.21	9.17	1.60	538318.22	1706336.14	N 39 58 23.77	W 80 32 52.15	4.11
	6176.00	39.09	72.26	6139.56	4807.38	-45.24	52.58	189.75	9.44	9.32	2.47	538327.07	1706362.92	N 39 58 23.86	W 80 32 51.81	4.19
	6224.00	44.00	72.36	6175.47	4843.29	-51.36	62.25	220.07	10.23	10.23	0.21	538336.74	1706393.24	N 39 58 23.96	W 80 32 51.42	4.28
	6271.00	48.99	71.42	6207.82	4875.64	-57.65	72.86	252.40	10.72	10.62	-2.00	538347.35	1706425.62	N 39 58 24.07	W 80 32 51.01	4.36
	6319.00	50.84	65.50	6238.74	4906.56	-62.24	86.35	286.56	10.19	3.85	-12.33	538360.84	1706459.74	N 39 58 24.20	W 80 32 50.57	4.44
	6366.00	49.60	57.89	6268.84	4936.66	-62.56	103.44	318.35	12.72	-2.64	-16.19	538377.93	1706491.51	N 39 58 24.38	W 80 32 50.17	4.52
	6413.00	48.77	51.06	6299.58	4967.40	-58.39	124.07	347.27	11.14	-1.77	-14.53	538398.56	1706520.44	N 39 58 24.58	W 80 32 49.80	4.58
	6460.00	48.79	45.24	6330.57	4998.39	-50.40	147.64	373.69	9.31	0.04	-12.38	538422.13	1706546.75	N 39 58 24.82	W 80 32 49.46	4.64
	6508.00	49.42	40.01	6362.00	5029.82	-38.82	174.33	398.14	8.34	1.31	-10.90	538448.81	1706571.30	N 39 58 25.09	W 80 32 49.15	4.69
	6555.00	50.78	35.68	6392.16	5059.98	-24.50	202.79	420.24	7.64	2.89	-9.21	538477.28	1706593.40	N 39 58 25.37	W 80 32 48.87	4.74
	6603.00	52.52	30.71	6421.95	5089.77	-6.81	234.20	440.82	8.69	3.63	-10.35	538508.77	1706613.08	N 39 58 25.68	W 80 32 48.61	4.79
	6650.00	54.98	26.11	6449.75	5117.57	13.75	267.62	458.82	8.47	5.23	-9.79	538542.10	1706631.98	N 39 58 26.01	W 80 32 48.39	4.84
	6697.00	56.35	22.16	6476.27	5144.09	37.15	303.03	474.67	7.53	2.91	-8.40	538577.51	1706647.83	N 39 58 26.37	W 80 32 48.19	4.88
	6744.00	58.12	18.09	6501.71	5169.53	63.14	340.13	488.25	8.20	3.77	-8.66	538614.61	1706661.41	N 39 58 26.73	W 80 32 48.02	4.92
	6792.00	60.03	14.76	6526.17	5193.99	92.25	379.74	499.92	7.94	5.23	-6.94	538654.22	1706673.07	N 39 58 27.13	W 80 32 47.87	4.96
	6839.00	63.54	10.79	6546.17	5215.99	123.33	420.23	509.08	9.70	6.19	-8.45	538694.71	1706682.23	N 39 58 27.53	W 80 32 47.76	5.00
	6887.00	66.25	7.14	6568.54	5236.36	157.70	463.18	515.63	8.90	5.65	-7.60	538737.63	1706688.99	N 39 58 27.95	W 80 32 47.68	5.04
	6934.00	67.78	3.46	6586.90	5254.72	193.54	506.23	519.82	7.91	3.26	-7.83	538780.70	1706692.97	N 39 58 28.38	W 80 32 47.64	5.08
	6982.00	69.61	359.50	6604.35	5272.17	232.16	550.92	520.97	8.58	3.81	-8.25	538825.39	1706694.12	N 39 58 28.82	W 80 32 47.63	5.12
	7029.00	71.61	355.34	6619.96	5287.78	271.94	595.20	518.96	9.37	4.26	-8.85	538869.66	1706692.11	N 39 58 29.26	W 80 32 47.66	5.15
	7076.00	72.34	351.08	6634.50	5302.32	313.37	639.56	513.67	8.76	1.55	-9.06	538914.03	1706686.83	N 39 58 29.70	W 80 32 47.74	5.19
	7123.00	72.22	346.73	6648.82	5316.64	356.02	683.48	505.06	8.82	-0.26	-9.26	538957.95	1706678.22	N 39 58 30.13	W 80 32 47.85	5.22
	7171.00	75.12	342.61	6662.32	5330.14	400.60	727.89	492.88	10.21	6.04	-8.58	539002.35	1706666.03	N 39 58 30.57	W 80 32 48.02	5.26
	7218.00	79.04	338.74	6672.83	5340.65	445.98	771.10	477.71	11.57	8.34	-8.23	539045.56	1706650.87	N 39 58 30.99	W 80 32 48.22	5.29
	7265.00	81.83	334.71	6680.64	5348.46	492.10	813.65	459.40	10.33	5.94	-8.57	539088.11	1706632.55	N 39 58 31.41	W 80 32 48.46	5.32
	7312.00	84.18	329.96	6686.37	5354.19	538.72	854.95	437.74	11.21	5.00	-10.11	539129.41	1706610.90	N 39 58 31.82	W 80 32 48.74	5.36

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Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	TVDSS (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	BR (°/100ft)	TR (°/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ' ")	Longitude (E/W ° ' ")	Directional Difficulty Index
	7360.00	88.90	326.50	6689.26	5357.09	588.55	895.67	412.52	12.18	9.83	-7.21	539170.12	1706585.68	N 39 58 32.22	W 80 32 49.07	5.39
	7389.00	89.90	325.33	6689.57	5357.39	615.42	919.68	396.27	5.31	3.45	-4.03	539194.14	1706569.43	N 39 58 32.45	W 80 32 49.29	5.41
	7455.00	90.58	324.82	6689.29	5357.11	681.04	973.80	358.49	1.29	1.03	-0.77	539248.25	1706531.65	N 39 58 32.98	W 80 32 49.78	5.43
	7550.00	90.93	325.27	6688.04	5355.86	775.48	1051.65	304.06	0.60	0.37	0.47	539326.10	1706477.23	N 39 58 33.74	W 80 32 50.49	5.47
	7646.00	90.88	325.97	6686.55	5354.37	870.01	1130.05	250.43	0.74	-0.07	0.74	539404.49	1706423.59	N 39 58 34.51	W 80 32 51.19	5.50
	7739.00	90.55	326.39	6685.40	5353.22	963.64	1208.13	198.11	0.56	-0.33	0.45	539482.57	1706371.28	N 39 58 35.26	W 80 32 51.87	5.54
	7833.00	90.38	325.45	6684.63	5352.45	1057.23	1285.99	145.44	1.02	-0.18	-1.00	539560.42	1706318.61	N 39 58 36.04	W 80 32 52.56	5.57
	7928.00	90.45	325.97	6683.95	5351.77	1151.79	1364.47	91.92	0.55	0.07	0.55	539638.91	1706265.09	N 39 58 36.81	W 80 32 53.26	5.60
	8023.00	90.41	325.53	6683.23	5351.05	1246.35	1443.00	38.46	0.47	-0.04	-0.46	539717.43	1706211.63	N 39 58 37.58	W 80 32 53.96	5.63
	8118.00	90.58	326.78	6682.41	5350.23	1340.97	1521.89	-14.45	1.33	0.18	1.32	539796.32	1706158.73	N 39 58 38.35	W 80 32 54.65	5.65
	8212.00	90.41	325.75	6681.60	5349.42	1434.62	1600.06	-66.65	1.11	-0.18	-1.10	539874.49	1706106.53	N 39 58 39.12	W 80 32 55.33	5.68
	8306.00	90.38	326.64	6680.95	5348.77	1528.25	1678.17	-118.95	0.95	-0.03	0.95	539952.59	1706054.23	N 39 58 39.89	W 80 32 56.02	5.71
	8401.00	90.58	324.24	6680.16	5347.98	1622.76	1756.40	-172.83	2.53	0.21	-2.53	540030.81	1706000.35	N 39 58 40.65	W 80 32 56.72	5.74
	8496.00	90.48	325.15	6679.28	5347.10	1717.13	1833.92	-227.73	0.96	-0.11	0.96	540108.33	1705945.45	N 39 58 41.41	W 80 32 57.44	5.76
	8590.00	90.52	325.16	6678.46	5346.28	1810.60	1911.06	-281.44	0.04	0.04	0.01	540185.47	1705891.75	N 39 58 42.17	W 80 32 58.14	5.76
	8685.00	90.38	324.29	6677.71	5345.53	1904.99	1988.62	-336.30	0.93	-0.15	-0.92	540263.02	1705836.89	N 39 58 42.93	W 80 32 58.86	5.81
	8779.00	90.45	324.26	6677.03	5344.85	1998.29	2064.93	-391.18	0.08	0.07	-0.03	540339.33	1705782.01	N 39 58 43.68	W 80 32 59.57	5.83
	8874.00	90.48	324.65	6676.26	5344.08	2092.03	2142.22	-446.41	0.41	0.03	0.41	540416.62	1705726.79	N 39 58 44.43	W 80 33 0.29	5.85
	8969.00	90.58	324.69	6675.38	5343.20	2187.02	2219.82	-501.21	0.27	0.11	0.25	540494.21	1705671.99	N 39 58 45.20	W 80 33 1.01	5.87
	9064.00	90.62	324.95	6674.39	5342.21	2281.44	2297.56	-555.80	0.08	0.04	0.06	540571.95	1705617.40	N 39 58 45.96	W 80 33 1.72	5.89
	9158.00	90.62	324.85	6673.45	5341.27	2374.86	2374.46	-609.85	0.15	-0.11	-0.11	540648.85	1705563.35	N 39 58 46.71	W 80 33 2.43	5.90
	9253.00	90.45	324.87	6672.65	5340.47	2469.27	2452.14	-664.53	0.08	-0.07	0.02	540726.53	1705508.67	N 39 58 47.47	W 80 33 3.14	5.92
	9348.00	90.45	325.10	6671.90	5339.72	2563.70	2529.94	-719.04	0.24	0.00	0.24	540804.33	1705454.17	N 39 58 48.23	W 80 33 3.85	5.94
	9442.00	90.69	325.11	6670.97	5338.79	2657.16	2607.04	-772.81	0.26	0.26	0.01	540881.42	1705400.40	N 39 58 48.99	W 80 33 4.56	5.96
	9537.00	90.55	325.56	6669.94	5337.76	2751.66	2685.17	-826.84	0.50	-0.15	0.47	540959.55	1705346.37	N 39 58 49.76	W 80 33 5.20	5.97
	9632.00	90.55	325.05	6669.03	5336.85	2846.14	2763.28	-880.91	0.54	0.00	-0.54	541037.65	1705292.30	N 39 58 50.52	W 80 33 5.97	5.99
	9726.00	90.45	324.38	6668.20	5336.02	2939.53	2840.00	-935.21	0.72	-0.11	-0.71	541114.37	1705239.01	N 39 58 51.27	W 80 33 6.68	6.01
	9821.00	90.52	324.63	6667.40	5335.22	3033.88	2917.35	-990.37	0.27	0.07	0.26	541191.71	1705182.85	N 39 58 52.03	W 80 33 7.40	6.02
	9916.00	90.45	322.90	6666.60	5334.42	3128.06	2993.97	-1048.52	1.82	-0.07	-1.82	541268.33	1705126.70	N 39 58 52.78	W 80 33 8.13	6.04
	10010.00	90.48	324.48	6665.83	5333.65	3221.25	3069.71	-1102.18	1.68	0.03	1.68	541344.07	1705071.05	N 39 58 53.52	W 80 33 8.86	6.06
	10105.00	90.52	323.56	6665.00	5332.82	3315.49	3146.58	-1157.09	0.97	0.04	-0.97	541420.94	1705015.24	N 39 58 54.28	W 80 33 9.58	6.08
	10200.00	90.52	323.84	6664.14	5331.96	3409.67	3223.14	-1214.23	0.29	0.00	0.29	541497.50	1704959.00	N 39 58 55.03	W 80 33 10.32	6.09
	10294.00	90.58	324.09	6663.24	5331.06	3502.91	3299.15	-1269.52	0.27	0.06	0.27	541573.50	1704903.71	N 39 58 55.77	W 80 33 11.04	6.11
	10389.00	90.55	323.93	6662.30	5330.12	3597.15	3376.02	-1325.34	0.17	-0.03	-0.17	541650.36	1704847.89	N 39 58 56.53	W 80 33 11.77	6.12
	10483.00	90.48	323.88	6661.46	5329.28	3690.38	3451.97	-1380.72	0.09	-0.07	-0.05	541726.31	1704792.52	N 39 58 57.27	W 80 33 12.49	6.14
	10578.00	90.45	323.47	6660.69	5328.51	3784.55	3528.50	-1438.99	0.43	-0.03	-0.43	541802.65	1704736.24	N 39 58 58.02	W 80 33 13.23	6.15
	10672.00	90.58	323.39	6659.84	5327.66	3877.68	3604.00	-1493.00	0.16	0.14	-0.09	541878.33	1704680.24	N 39 58 58.76	W 80 33 13.96	6.16
	10767.00	90.48	324.70	6658.96	5326.78	3971.93	3680.89	-1548.77	1.38	-0.11	1.38	541955.23	1704624.47	N 39 58 59.51	W 80 33 14.68	6.18
	10861.00	90.48	325.73	6658.18	5326.00	4065.40	3758.09	-1602.40	1.10	0.00	1.10	542032.42	1704570.85	N 39 59 0.27	W 80 33 15.38	6.19
	10956.00	90.45	325.51	6657.41	5325.23	4159.95	3836.49	-1656.04	0.23	-0.03	-0.23	542110.82	1704517.21	N 39 59 1.04	W 80 33 16.00	6.21
	11050.00	90.48	325.54	6656.64	5324.46	4253.48	3913.08	-1709.25	0.05	0.03	0.03	542188.30	1704464.00	N 39 59 1.80	W 80 33 16.78	6.22
	11145.00	90.41	324.97	6655.90	5323.72	4347.96	3992.04	-1763.39	0.60	-0.07	-0.60	542266.36	1704409.87	N 39 59 2.56	W 80 33 17.49	6.23
	11239.00	90.45	324.87	6655.20	5323.02	4441.39	4068.06	-1817.41	0.11	0.04	-0.11	542343.28	1704355.85	N 39 59 3.32	W 80 33 18.19	6.24
	11334.00	90.52	325.06	6654.39	5322.21	4535.82	4146.74	-1871.94	0.21	0.07	0.20	542421.06	1704301.31	N 39 59 4.08	W 80 33 18.91	6.26
	11429.00	90.48	324.89	6653.57	5321.39	4630.25	4224.54	-1926.47	0.18	-0.04	-0.18	542498.85	1704246.70	N 39 59 4.84	W 80 33 19.62	6.27
	11523.00	90.45	325.51	6652.80	5320.62	4723.72	4301.72	-1980.11	0.66	-0.03	0.66	542578.03	1704193.15	N 39 59 5.60	W 80 33 20.32	6.28
	11618.00	90.52	324.49	6652.00	5319.82	4818.16	4379.54	-2034.60	1.08	0.07	-1.07	542653.84	1704138.67	N 39 59 6.36	W 80 33 21.03	6.29
	11712.00	90.41	324.72	6651.24	5319.06	4911.53	4456.16	-2089.04	0.27	-0.12	0.24	542730.46	1704084.22	N 39 59 7.11	W 80 33 21.74	6.30
	11807.00	90.38	325.08	6650.58	5318.40	5005.95	4533.88	-2143.67	0.38	-0.03	0.38	542808.18	1704029.60	N 39 59 7.87	W 80 33 22.45	6.32
	11901.00	90.52	325.74	6649.84	5317.66	5099.46	4611.27	-2197.03	0.72	0.15	0.70	542885.56	1703976.24	N 39 59 8.63	W 80 33 23.15	6.33
	11996.00	90.55	325.84	6648.96	5316.78	5194.03	4689.83	-2250.44	0.11	0.03	0.11	542964.12	1703922.84	N 39 59 9.40	W 80 33 23.85	6.34
	12091.00	90.55	325.62	6648.04	5315.86	5288.59	4768.33	-2303.93	0.23	0.00	-0.23	543042.62	1703869.35	N 39 59 10.17	W 80 33 24.55	6.35
	12185.00	90.34	325.57	6647.31	5315.13	5382.13	4845.88	-2357.04	0.23	-0.22	-0.05	543120.17	1703816.24	N 39 59 10.93	W 80 33 25.24	6.36
	12280.00	90.45	325.24	6646.66	5314.48	5476.64	4924.08	-2410.98	0.37	0.12	-0.35	543198.38	1703762.30	N 39 59 11.70	W 80 33 25.95	6.37
	12375.00	90.34	325.39	6646.00	5313.82	5571.13	5002.20	-2465.04	0.20	-0.12	0.16	543276.48	1703708.24	N 39 59 12.46	W 80 33 26.65	6.38
	12469.00	90.38	324.92	6645.41	5313.23	5664.60	5078.34	-2518.74	0.50	0.04	-0.50	543353.62	1703654.54	N 39 59 13.22	W 80 33 27.36	6.39
	12564.00	90.38	325.26	6644.78	5312.60	5759.05	5157.25	-2573.11	0.36	0.00	0.36	543431.52	1703600.18	N 39 59 13.98	W 80 33 28.07	6.40
	12659.00	90.89	325.32	6643.73	5311.55	5853.53	5235.34	-2627.20	0.54	0.54	0.06	543509.60	1703546.09	N 39 59 14.75	W 80 33 28.77	6.41
	12753.00	91.13	325.49	6642.07	5309.89	5947.03	5312.70	-2680.56	0.31	0.26	0.18	543588.97	1703492.73	N 39 59 15.51	W 80 33 29.47	6.42
	12848.00	91.00	325.79	6640.31	5308.13	6041.57	5391.11	-2734.17	0.34	-0.14	0.32	543665.37	1703439.12	N 39 59 16.27	W 80 33 30.17	6.43
	12943.00	90.79	325.13	6638.82	5306.64	6136.07	5469.36	-2788.03	0.73	-0.22	-0.69	543743.61	1703385.27	N 39 59 17.04	W 80 33 30.87	6.44
	13037.00	90.93	325.72	6637.41	5305.23	6229.58	5546.75	-2841.36	0.65	0.15	0.63	543821.00	1703331.93	N 39 59 17.80	W 80 33 31.57	6.45
	13132.00	90.00	325.63	6635.85	5303.67	6324.12	5625.19	-2894.93	0.10	0.03	-0.09	543899.44	1703278.37	N 39 59 18.57	W 80 33 32.27	6.46

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Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	TVDSS (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	BR (°/100ft)	TR (°/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ' ")	Longitude (E/W ° ' ")	Directional Difficulty Index
	13227.00	91.03	325.04	6634.20	5302.02	6418.68	5703.60	-2948.54	0.07	0.07	0.01	543977.85	1703224.76	N 39 59 19.34	W 80 33 32.97	6.47
	13321.00	90.98	326.33	6632.56	5300.38	6512.25	5781.50	-3001.12	0.74	-0.07	0.73	544055.75	1703172.19	N 39 59 20.10	W 80 33 33.66	6.48
	13416.00	90.93	325.34	6631.00	5298.82	6606.81	5860.10	-3054.46	1.04	-0.03	-1.04	544134.34	1703118.85	N 39 59 20.87	W 80 33 34.38	6.49
	13511.00	90.48	325.33	6629.83	5297.65	6701.30	5938.23	-3108.49	0.47	-0.47	-0.01	544212.46	1703064.82	N 39 59 21.64	W 80 33 35.06	6.50
	13605.00	90.41	325.81	6629.10	5296.92	6794.84	6015.76	-3161.64	0.52	-0.07	0.51	544289.99	1703011.68	N 39 59 22.40	W 80 33 35.76	6.51
	13700.00	90.21	325.65	6628.58	5296.40	6889.40	6094.26	-3215.13	0.27	-0.21	-0.17	544368.49	1702958.18	N 39 59 23.17	W 80 33 36.46	6.52
	13795.00	90.00	324.04	6628.41	5296.23	6983.81	6171.93	-3269.83	1.71	-0.22	-1.69	544446.16	1702903.49	N 39 59 23.93	W 80 33 37.17	6.53
	13889.00	89.90	324.16	6628.49	5296.31	7077.08	6248.08	-3324.95	0.17	-0.11	0.13	544522.30	1702848.37	N 39 59 24.67	W 80 33 37.89	6.54
	13984.00	90.03	324.54	6628.55	5296.37	7171.40	6325.27	-3380.32	0.42	0.14	0.40	544599.49	1702793.01	N 39 59 25.43	W 80 33 38.61	6.55
	14078.00	89.93	324.51	6628.58	5296.40	7265.75	6402.64	-3435.45	0.11	-0.11	-0.03	544676.85	1702737.87	N 39 59 20.19	W 80 33 39.33	6.56
	14173.00	89.73	323.65	6628.88	5296.68	7359.02	6478.76	-3490.59	0.94	-0.21	-0.91	544752.97	1702682.73	N 39 59 26.93	W 80 33 40.05	6.57
	14268.00	89.90	324.40	6629.17	5296.99	7453.27	6555.84	-3546.40	0.81	0.18	0.79	544829.85	1702626.93	N 39 59 27.69	W 80 33 40.78	6.58
	14362.00	90.07	324.19	6629.19	5297.01	7546.58	6631.97	-3601.26	0.20	0.18	-0.22	544906.18	1702572.07	N 39 59 28.44	W 80 33 41.50	6.59
	14457.00	90.00	324.08	6629.14	5296.96	7640.85	6708.96	-3656.92	0.14	-0.07	-0.12	544983.16	1702516.42	N 39 59 29.19	W 80 33 42.22	6.59
	14551.00	89.90	324.87	6629.22	5297.04	7734.20	6785.46	-3711.54	0.85	-0.11	0.84	545059.66	1702461.80	N 39 59 29.94	W 80 33 42.94	6.60
Survey 07-Feb-14	14590.00	89.93	322.85	6629.26	5297.10	7772.87	6816.96	-3734.53	5.18	0.08	-5.18	545091.15	1702438.80	N 39 59 30.25	W 80 33 43.24	6.61
PTB	14672.00	89.93	322.85	6629.38	5297.20	7854.00	6882.31	-3784.06	0.00	0.00	0.00	545156.51	1702389.28	N 39 59 30.69	W 80 33 43.88	6.62

Survey Type: Def Survey

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

Description	Part	MD From (ft)	MD To (ft)	EOU Freq (ft)	Hole Size (in)	Casing Diameter (in)	Survey Tool Type	Borehole / Survey
	1	0.000	23.000	Act Stns	30.000	30.000	SLB_NSG+MSHOT-Depth Only	Original Borehole / Noble Energy SHL-26B-HS Gyro+MWD 0ft to 14627ft MD
	1	23.000	1158.000	Act Stns	30.000	30.000	SLB_NSG+MSHOT	Original Borehole / Noble Energy SHL-26B-HS Gyro+MWD 0ft to
	1	1158.000	14590.000	Act Stns	30.000	30.000	SLB_MWD-STD	Original Borehole / Noble Energy SHL-26B-HS Gyro+MWD 0ft to
	1	14590.000	14672.000	Act Stns	30.000	30.000	SLB_BLIND+TREND	Original Borehole / Noble Energy SHL-26B-HS Gyro+MWD 0ft to

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Noble Energy

noble energy

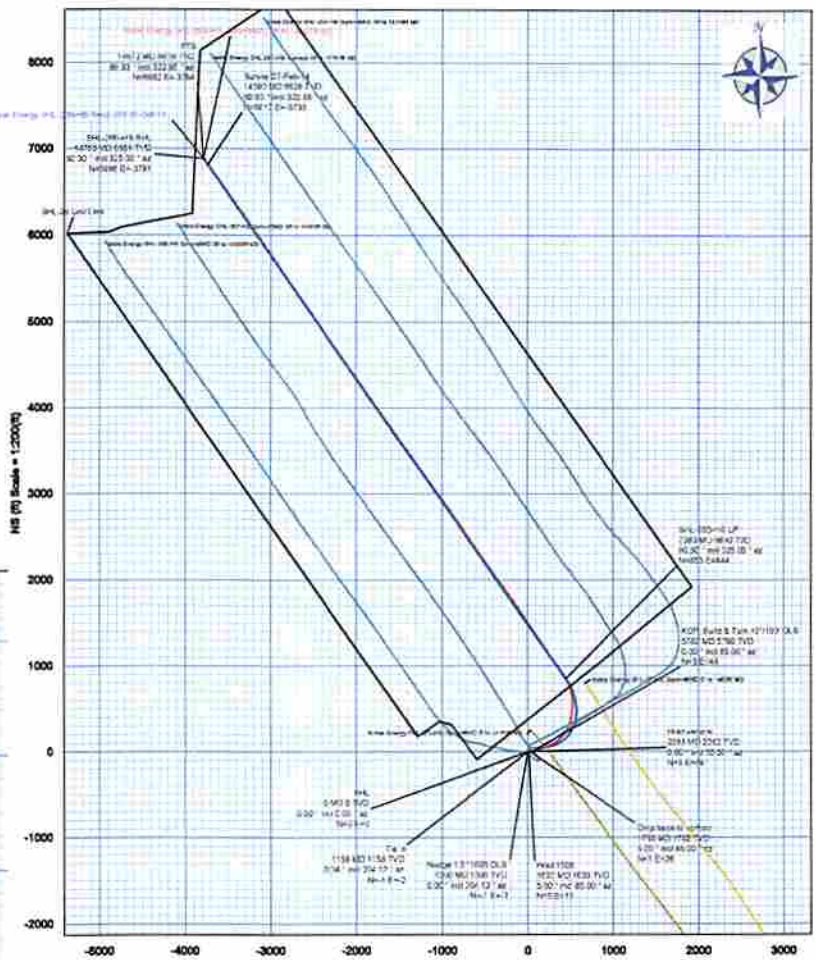
Borehole:	Well:	Field:	Structure:
Original Borehole	SHL-26B-HS	WV Marshall County (NAD 27)	Nabors M59

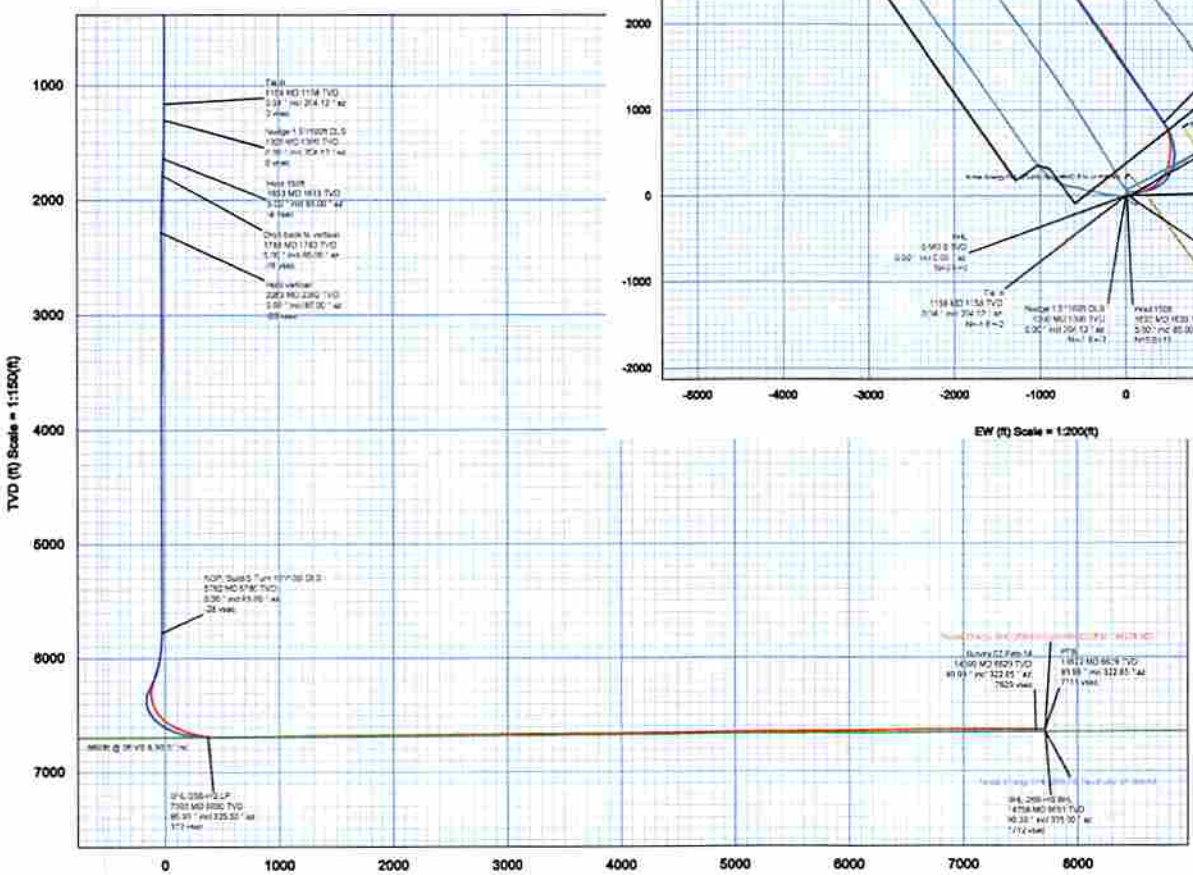
Gravity & Magnetic Parameters																	
Model:	HDGM 2013	Dip:	67.5°	Date:	23-Jan-2014	Surface Location	NAD27 West Virginia State Plane, Northern Zone, US Feet					Miscellaneous					
MagDec:	-8.418°	FS:	51112.50nT	Gravity FS:	999.246mgn (9.80665 Based)	Lat:	N 39 38 23.32	Northing:	530274.492ftUS	Grid Conv:	-0.669°	Slot:	SHL-26B-HS	TVD Ref:	KB(1332.18ft above MSL)		
						Lon:	W 80 32 54.24	Easting:	1704173.176ftUS	Scale Fact:	0.99990906	Plan:	Noble Energy SHL-26B-HS Gyro+MWD 0ft to 14527ft MD				

Part	Seq	Survey Tool Name / Survey Tool Code	Inclination Tool	Hole Size (in)	Casing Size (in)	MD From (ft)	MD To (ft)	Survey Frequency (Sec Min)	E(W) Error (Sec Min)	N(S) Error (Sec Min)	Comments Contingency
1	1	G_SS_MWD+IFR1+MS+SAG Only		30	30	0	20	Act Stns	1.26	1.26	
1	2	G_SS_MWD+IFR1+MS+SAG		30	30	20	1158	Act Stns	3.17	2.61	
1	3	G_SS_MWD+IFR1+MS+SAG		30	30	1158	14490	Act Stns	31.18	14.42	
1	4	G_SS_MWD+IFR1+MS+SAG		30	30	14490	14527	Act Stns	33.11	3.14	

Critical Points									
Critical Point	MD	INCL	AZIM	TVD	VSEC	NS(+N/-S)	EW(+E/-W)	DLS
KOP	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Survey 27 Feb 14	14490.00	89.93	322.85	6629.28	7711.87	4818.46	-5784.54	0.19
PTB	14472.00	89.93	322.85	6629.28	7694.08	4806.31	-5766.34	0.00

Surface Location							
Northing: 530274.492	Easting: 1704173.176	Latitude: N 39 38 23.32	Longitude: W 80 32 54.24	Plan Azimuth: 320.254			
Target Description				Grid Coord			Local Coord
Target Name	Shape	Dimension	Latitude	Longitude	Northing	Easting	TVD	Vsec	N(+)/S(-)	E(+)/W(-)
SHL_26 Unit Line - 100' West	Polyline	N/A	N 39 38 23.32	W 80 32 54.24	530274.41	1704173.53	1332.18	0.00	0.11	0.15
SHL_26 Unit Line	Polyline	N/A	N 39 38 23.32	W 80 32 54.24	530274.41	1704173.53	1332.18	0.00	0.11	0.15
SHL_26 Unit Line - 50' West	Polyline	N/A	N 39 38 23.32	W 80 32 54.24	530274.41	1704173.53	1332.18	0.00	0.11	0.15
SHL_26B-HS BHL	Point	N/A	N 39 38 30.00	W 80 33 43.84	541134.00	1702300.00	6601.00	7463.34	10810.00	-3784.74
SHL_26B-HS LP	Point	N/A	N 39 38 31.79	W 80 32 48.67	530537.07	1706890.00	6600.00	5120.00	263.0	4416.00
Weight @ 26 VS & 90.0° inc	Plane	N/A	N 39 38 23.32	W 80 32 54.24	530274.492	1704173.176	6600.00	0.00	0.00	0.00



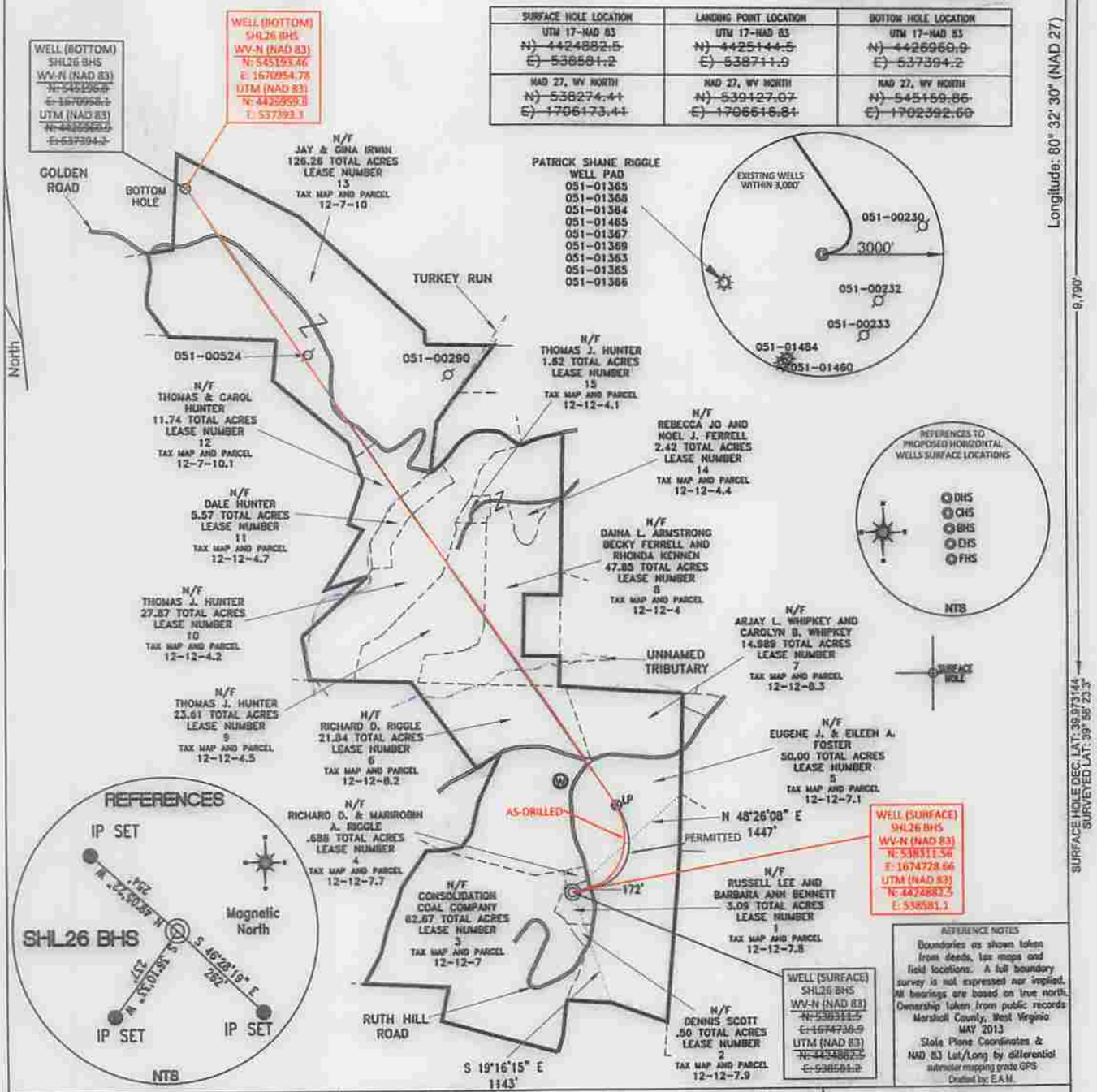


Grid North
Tot Corr (M->G -7.749°)
Mag Dec (-8.418°)
Grid Corr (-0.669°)

SURFACE HOLE DEC. LONG: 80.548399
SURVEYED LONG: 80° 32' 54.2" — 1,880'

Latitude: 40° 00' 00" (NAD 27)

SURFACE HOLE LOCATION	LANDING POINT LOCATION	BOTTOM HOLE LOCATION
UTM 17-NAD 83	UTM 17-NAD 83	UTM 17-NAD 83
~~N) 4424882.5~~	~~N) 4425144.5~~	~~N) 4426960.9~~
~~E) 538581.2~~	~~E) 538711.9~~	~~E) 537394.2~~
NAD 27, WV NORTH	NAD 27, WV NORTH	NAD 27, WV NORTH
~~N) 538274.41~~	~~N) 539127.07~~	~~N) 545159.86~~
~~E) 1706173.41~~	~~E) 1706615.81~~	~~E) 1702392.60~~



FILE #: NOB 002

DRAWING #: 2219

SCALE: PLAT - 1" = 1400'
TICK MARK - 1" = 2000'

MINIMUM DEGREE OF ACCURACY: 1/200

PROVEN SOURCE OF ELEVATION: SUBMETER MAPPING GRADE GPS

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 DEPARTMENT OF ENVIRONMENTAL PROTECTION.

Signed:

L.L.S. #2124 : Ernest J. Benchek III

ERNEST J. BENCHEK III
LICENSED
No. 2124
STATE OF
WEST VIRGINIA
PROFESSIONAL SURVEYOR

(+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS

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

DATE: AUGUST 8, 2014

OPERATOR'S WELL #: SHL26 BHS AS-DRILLED

API WELL #: 47 (STATE) 51 (COUNTY) 01656 (PERMIT)

Well Type: ☐ Oil ☐ Waste Diposal ☒ Production ☐ Deep
☒ Gas ☐ Liquid Injection ☐ Storage ☒ Shallow

WATERSHED: WHEELING CREEK

ELEVATION: 1,320'

COUNTY/DISTRICT: MARSHALL / SANDHILL

QUADRANGLE: MAJORSVILLE WV-PA

SURFACE OWNER: RUSSELL LEE AND BARBARA ANN BENNETT

ACREAGE: 3.09 +/-

OIL & GAS ROYALTY OWNER: JAMES O. WHIPKEY ET AL

ACREAGE: 317.83 +/-

LEASE NUMBERS:

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

TARGET FORMATION: MARCELLUS

ESTIMATED DEPTH: TVD: 6,698' TMD: 14,783'

WELL OPERATOR: NOBLE ENERGY, INC.

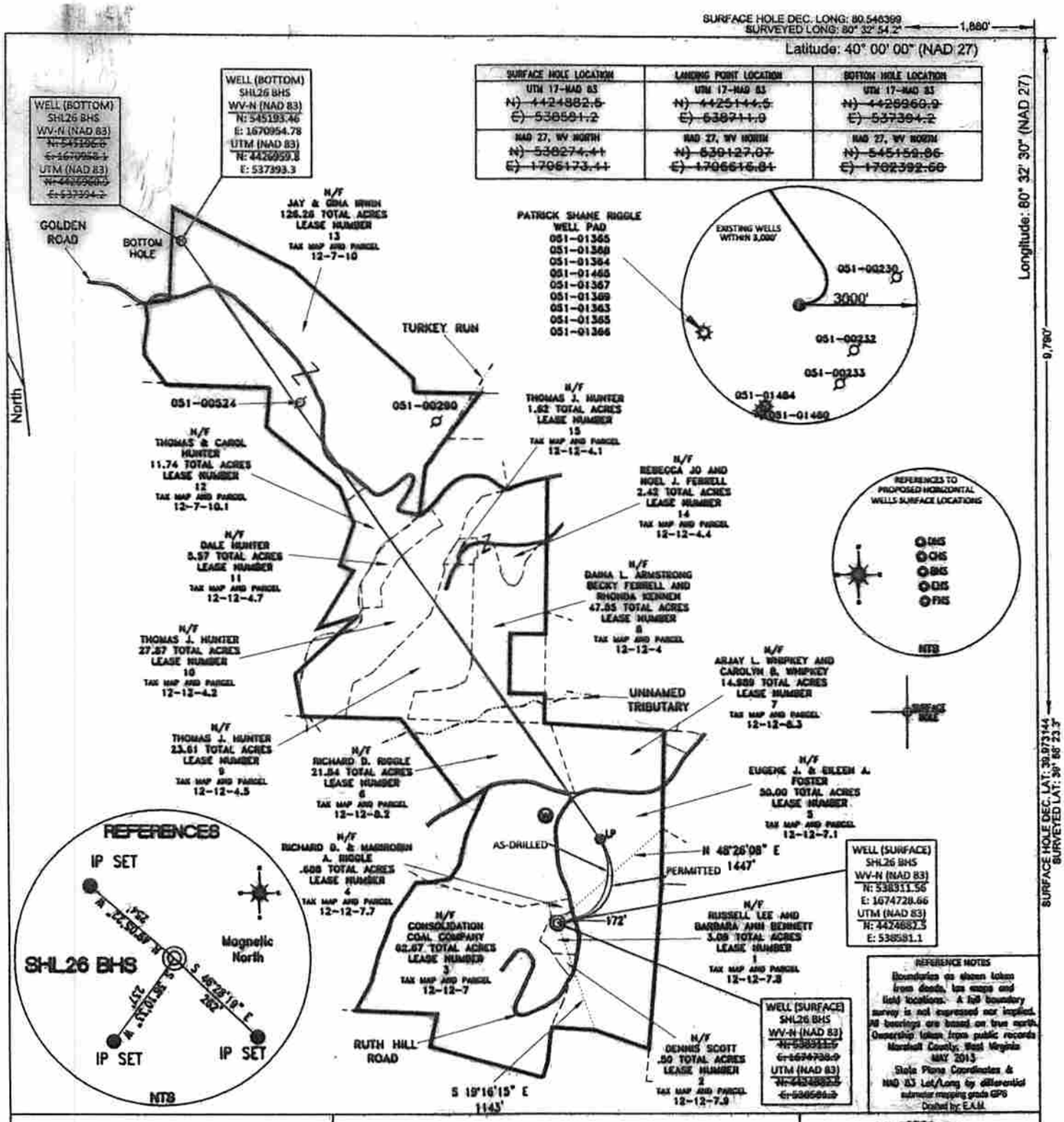
DESIGNATED AGENT: STEVEN M. GREEN

ADDRESS: 333 TECHNOLOGY DRIVE SUITE 116

ADDRESS: 500 VIRGINIA STREET EAST

CITY: CANONSBURG STATE: PA ZIP CODE: 15317

CITY: CHARLESTON STATE: WV ZIP CODE: 25301



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

TARGET FORMATION: MARCELLUS

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DESIGNATED AGENT: STEVEN M. GREEN

ADDRESS: 333 TECHNOLOGY DRIVE SUITE 116

ADDRESS: 500 VIRGINIA STREET EAST

CITY: CANONSBURG STATE: PA ZIP CODE: 15317

CITY: CHARLESTON STATE: WV ZIP CODE: 25301

JR

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Rev. 8/23/13

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

API 47- 051 - 01657 County Marshall District Sandhill
Quad Majorsville Pad Name SHL-26 Field/Pool Name
Farm name Russell Lee and Barbara Ann Bennett Well Number SHL26FHS
Operator (as registered with the OOG) Noble Energy Inc.
Address 333 Technology Drive, Suite 116 City Canonsburg State PA Zip 15317

As Drilled location NAD 83/UTM Attach an as-drilled plat, profile view, and deviation survey
Top hole Northing 4424873.47062 Easting 538581.896241
Landing Point of Curve Northing 4424994.125117 Easting 538527.159658
Bottom Hole Northing 4426733.670819 Easting 537301.74582

Elevation (ft) 1314.0 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)
Synthetic Oil Based

Date permit issued 06/26/2013 Date drilling commenced 09/19/2013 Date drilling ceased 11/21/2013
Date completion activities began 04/07/2014 Date completion activities ceased 05/24/2014
Verbal plugging (Y/N) N Date permission granted _____ Granted by _____

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

RECEIVED
Office of Oil and Gas
SEP 11 2014
WV Department of
Environmental Protection

Freshwater depth(s) ft 198', 300' Open mine(s) (Y/N) depths N
Salt water depth(s) ft N/A Void(s) encountered (Y/N) depths N
Coal depth(s) ft 761' to 771' Pittsburgh Cavern(s) encountered (Y/N) depths N
Is coal being mined in area (Y/N) Y

Reviewed by:

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Rev. 8/23/13

API 47- 051 - 01657 Farm name Russell Lee and Barbara Ann Bennett Well number SHL26FHS

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	36	30	40	N	K-55 94#		
Surface	24	20	418	N	J-55 94#		Y
Coal	17 1/2	13 3/8	1220	N	J-55 54.5#		Y
Intermediate 1	12 3/8	9 5/8	3234.8	N	K-55 36#		Y
Intermediate 2							
Intermediate 3							
Production	8 3/4	5 1/2	14030.5	N	P-110 20#		Y
Tubing							
Packer type and depth set							

Comment Details 2 Baskets on Surface Casing

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	Type 1	486	15.6	1.19	103	0	8
Coal	Class A	1027	15.6	1.2	220	0	8
Intermediate 1	Class A	1265	15.6	1.2	270	0	8
Intermediate 2							
Intermediate 3							
Production	Class A	2302	14.8	1.25	512	3000	8
Tubing							

Drillers TD (ft) 14,040 Loggers TD (ft) 14040
Deepest formation penetrated Marcellus Plug back to (ft) not a pilot Hole
Plug back procedure not a pilot Hole

Kick off depth (ft) 7053

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
4 Centralizers on Surface casing. 10 Centralizers on Coal casing. 40 Centralizers on Intermediate casing. 253 Centralizers on Production casing.
On the Surface, Coal, and Intermediate Strings, the centralizers are on every 3 joint of casing.
On the Production String, they are on every 3rd from Surface to Top of Curve, then every joint until TD

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

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API 47- 051 - 01657 Farm name Russell Lee and Barbara Ann Bennett Well number SHL26FHS

PERFORATION RECORD

Stage No.	Perforation date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formation(s)

PLEASE SEE ATTACHED PERFORATION RECORD

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 (bbls)	Amount of Nitrogen/other (units)

PLEASE SEE ATTACHED STIMULATION INFORMATION PER STAGE SHEET

Please insert additional pages as applicable.

PERFORATION RECORD

API: 47-051-01657 Farm name: Russell Lee and Barbara Ann Bennett Well Name: SHL-26F-HS

Stage No.	Stim Date	Top Perf	Bottom Perf	# of Perfs	Formation
TOE SLEEVE	3/7/2014	13903	13905	0	Marcellus
1	4/7/2014	13826	13893	48	Marcellus
2	4/7/2014	13675	13777	40	Marcellus
3	4/7/2014	13525	13627	40	Marcellus
4	4/8/2014	13375	13477	40	Marcellus
5	4/9/2014	13225	13327	40	Marcellus
6	4/9/2014	13075	13177	40	Marcellus
7	4/9/2014	12925	13027	40	Marcellus
8	4/9/2014	12775	12877	40	Marcellus
9	4/10/2014	12625	12727	40	Marcellus
10	4/10/2014	12475	12577	40	Marcellus
11	4/10/2014	12325	12427	40	Marcellus
12	4/11/2014	12175	12277	40	Marcellus
12 REPERF	4/12/2014	12151	12173	24	Marcellus
12 C	4/12/2014	12025	12127	40	Marcellus
13	4/13/2014	11875	11977	40	Marcellus
14	4/13/2014	11725	11827	40	Marcellus
15	4/14/2014	11575	11677	40	Marcellus
16	4/15/2014	11425	11527	40	Marcellus
17	4/15/2014	11275	11377	40	Marcellus
18	4/16/2014	11125	11227	40	Marcellus
19	4/16/2014	10975	11077	60	Marcellus
20	4/17/2014	10825	10927	40	Marcellus
21	4/17/2014	10675	10777	40	Marcellus
22	4/18/2014	10525	10627	40	Marcellus
23	4/18/2014	10375	10477	40	Marcellus
24	4/18/2014	10225	10327	40	Marcellus
25	4/19/2014	10075	10177	40	Marcellus
26	4/19/2014	9925	10027	40	Marcellus
27	4/20/2014	9775	9877	40	Marcellus
28	4/20/2014	9625	9727	40	Marcellus
29	4/20/2014	9475	9577	40	Marcellus
30	4/21/2014	9325	9427	40	Marcellus
30b	4/30/2014	9337	9414	32	Marcellus
30c	5/1/2014	9175	9277	40	Marcellus
31	5/2/2014	9025	9127	40	Marcellus
31 REPERF	5/3/2014	9038.5	9115	32	Marcellus
31C	5/3/2014	8875	8997	48	Marcellus
32	5/4/2014	8725	8827	48	Marcellus
33	5/10/2014	8575	8677	48	Marcellus
34	5/11/2014	8425	8527	48	Marcellus

PERFORATION RECORD

API: 47-051-01657 Farm name: Russell Lee and Barbara Ann Bennett Well Name: SHL-26F-HS

Stage No.	Stim Date	Top Perf	Bottom Perf	# of Perfs	Formation
35	5/11/2014	8275	8377	48	Marcellus
35 REPERF	5/11/2014	8285	8347	32	Marcellus
36	5/12/2014	8125	8227	48	Marcellus
37	5/12/2014	7975	8077	48	Marcellus
38	5/12/2014	7825	7927	48	Marcellus
39	5/12/2014	7675	7777	48	Marcellus
40	5/13/2014	7525	7627	48	Marcellus
41	5/13/2014	7375	7477	48	Marcellus
42	5/14/2014	7225	7327	48	Marcellus
43	5/14/2014	7075	7177	48	Marcellus

STIMULATION INFORMATION PER STAGE

API: 47-051-01657 Farm name: Russell Lee and Barbara Ann Bennett Well Name: SHL-26F-HS

Stage No.	Stim Date	Avg Rate (bpm)	ATP (psi)	Max BD Pressure	ISIP (psi)	Proppant (lbs)	Water (BBLS)	Amount of N^2/ other
Inj Test	4/7/2014	15.0	7687			0	574.119	
1	4/7/2014	78.0	7808	5852	3617	302577	7701.208	
2	4/7/2014	87.3	8115	5653	3889	301750	7909.514	
3	4/8/2014	89.3	7934	5591	4337	300250	7445.602	
4	4/8/2014	84.0	8237	5827	4055	301188	6816.762	
5	4/9/2014	89.1	7938	5676	4403	302098	7145.28	
6	4/9/2014	83.3	7878	5482	4281	300668	6879.147	
7	4/9/2014	79.9	8033	5565	4398	300903	7411.176	
8	4/9/2014	88.0	8541	5642	4444	299781	7562.47	
9	4/10/2014	84.7	8097	5364	4298	299814	6919.95	
10	4/10/2014	86.1	7861	5607	4734	301101	6956.541	
11	4/10/2014	88.7	7876	5442	4461	299783	6914.961	
12	4/11/2014	35.2	8178	6110	5528	4041	4705.23	
12B	4/12/2014	68.4	8850	6834	5390	1967	5157.67	
12C	4/13/2014	88.7	8370	5517	4820	600907	15757.27	
13	4/14/2014	77.6	8422	5438	4463	249989	9222.6	
13B	4/14/2014	50.1	9033	6655	5237	195	1349.52	
14	4/14/2014	87.6	8252	5538	4228	301705	7516.091	
15	4/15/2014	87.3	8258	5213	4176	298050	7957.861	
16	4/15/2014	84.6	7848	5136	4514	301582	6727.043	
17	4/16/2014	86.8	8096	5389	4316	302989	7170.27	
18	4/16/2014	83.4	7940	5337	4242	304255	7906.393	
19	4/16/2014	88.5	7642	5238	4720	300619	6693.389	
20	4/17/2014	79.3	7404	5533	4513	300539	6424.864	
21	4/17/2014	86.1	8157	5817	4453	302204	6521.453	
22	4/18/2014	82.3	8315	5632	4248	304361	6496.429	
23	4/18/2014	86.9	7489	5380	4073	300600	6730.333	
24	4/19/2014	89.6	7701	5375	4272	297485	6430.732	
25	4/19/2014	87.0	7147	5163	4523	299461	6290.735	
26	4/19/2014	86.8	7741	5312	4382	301958	7328.654	
27	4/20/2014	86.0	7104	5374	4076	299908	6752.136	
28	4/20/2014	86.5	8152	5552	3954	297212	6722.241	
29	4/21/2014	89.0	7892	5140	4603	301959	6384.632	
30	4/21/2014	83.7	7724	5942		155828	4790.755	
30B	5/1/2014	4.6	6230			0	65.83	
30C	5/1/2014	9.7	7791		5924	0	2970.5	
30D	5/2/2014	71.2	8134		4482	445490	13851.37	
31	5/3/2014	49.2	8495	6397	5390	5405	8165.833	
31B	5/3/2014	48.6	7503		6588	147710	11193.01	
31C	5/3/2014	84.5	7167		4305	446438	9366.009	
32	5/4/2014	86.4	73557	6224	8960	166717	5413.509	

STIMULATION INFORMATION PER STAGE

API: 47-051-01657 Farm name: Russell Lee and Barbara Ann Bennett Well Name: SHL-26F-HS

Stage No.	Stim Date	Avg Rate (bpm)	ATP (psi)	Max BD Pressure	ISIP (psi)	Proppant (lbs)	Water (BBLS)	Amount of N^2/ other
32 Inj	5/5/2014	4.5	7397		9042	0	133.7619	
32 Inj 2	5/6/2014						0	
32B	5/10/2014	89.6	7278	6086	4681	132332	4554.08	
33	5/10/2014	88.2	7159	5601	4389	302823	6882.87	
34	5/11/2014	87.5	7065	6030	4630	300643	6530.95	
35	5/11/2014	86.3	7066	5754	5221	140073	8843.78	
35B	5/11/2014	86.8	7218		4883	157969	4854.317	
36	5/12/2014	88.2	7191	5883	4093	298960	7948.524	
37	5/12/2014	89.3	8544	5884	4180	299752	6234.451	
38	5/12/2014	85.4	7071	5398	4460	300180	7823.714	
39	5/13/2014	87.9	6652	5791	4346	302783	6319.786	
40	5/13/2014	87.8	6802	5432	4368	301544	6420.777	
41	5/14/2014	88.0	6779	5459	4694	302187	6712.263	
42	5/14/2014	88.9	6618	6817	4413	303298	6070.786	
43	5/15/2014	87.4	6697	5102	4480	300142	6815.926	

WR-35
Rev. 8/23/13

API 47- 051 - 01657 Farm name Russell Lee and Barbara Ann Bennett Well number SHL26FHS

PRODUCING FORMATION(S)	DEPTHS			
Marcellus	6644	TVD	14040	MD

Please insert additional pages as applicable.

GAS TEST ☐ Build up ☐ Drawdown ■ Open Flow OIL TEST ☐ Flow ☐ Pump

SHUT-IN PRESSURE Surface _____ psi Bottom Hole _____ psi DURATION OF TEST _____ hrs

OPEN FLOW	Gas	Oil	NGL	Water	GAS MEASURED BY
	3227 mcfpd	23 bpd	146 bpd	1139 bpd	☐ Estimated ■ Orifice ☐ Pilot

LITHOLOGY/ FORMATION NAME	TOP DEPTH IN FT TVD	BOTTOM DEPTH IN FT TVD	TOP DEPTH IN FT MD	BOTTOM DEPTH IN FT MD	DESCRIBE ROCK TYPE AND RECORD QUANTITY AND TYPE OF FLUID (FRESHWATER, BRINE, OIL, GAS, H_2S, ETC)
	0		0		

PLEASE SEE FORMATIONS SHEET

Please insert additional pages as applicable.

Drilling Contractor Nabors Drilling USA, LP
Address 515 West Greens Rd, Suite 1000 City Houston State TX Zip 77067-4525

Logging Company Horizon Well Logging, LLC
Address 7136 S. Yale Ave. Suite 414 City Tulsa State OK Zip 74136

Cementing Company CalFrac
Address 717 17th St., Suite 1445 City Denver State CO Zip 80202

Stimulating Company Halliburton Energy Services
Address 121 Champion Way, Suite 210 City Canonsburg State PA Zip 15317

Please insert additional pages as applicable.

Completed by Lee Swiger Telephone 724-820-3061
Signature Lee Swiger Title Reg. Analyst Date 8-8-14

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

FORMATIONS

API 47-051-5101657 Farm Name Russell Lee and Barbara Ann Bennett Well Name SHL26F

Lithology/Formation	Top Depth in FT TVD	Bottom Depth in FT TVD	Top Depth in Ft MD	Bottom Depth in FT MD	Describe Rock Type and Record Quantity and Type of Fluid (Freshwater, Brine, Oil, Gas, H2S, ETC)
Shale	0	808	0	808	
Pittsburgh Coal	808	817	808	817	
Shale and Sandstone	817	1264	817	1264	
Dunkard Sand	1264	1275	1264	1275	
Shale	1275	1446	1275	1446	
Gas Sand	1446	1485	1446	1485	
Shale	1485	1577	1485	1577	
1st Salt Sand	1577	1601	1577	1601	
Shale	1601	1610	1601	1610	
2nd Salt Sand	1610	1655	1610	1655	
Shale	1655	1738	1655	1738	
Maxton Sand	1738	1750	1738	1750	
Shale	1750	1793	1750	1793	
Big Lime	1793	1873	1793	1873	
Big Injun	1873	2067	1873	2067	
Price	2067	2425	2067	2425	
Murrysville	2425	2439	2425	2439	
Shale	2439	2636	2439	2636	
50' Sand	2636	2638	2636	2638	
Shale	2638	2691	2638	2691	
30' Sand	2691	2700	2691	2700	
Shale	2700	2742	2700	2742	
Gordon Stray	2742	2757	2742	2757	
Shale	2757	2793	2757	2793	
Gordon	2793	2806	2793	2806	
Shale	2806	2902	2806	2902	
Fifth Sand	2902	2936	2902	2936	
Shale	2936	3342	2936	3342	
Speechley Sand	3342	3370	3342	3370	
Shale	3370	4378	3370	4378	
Warren Sand	4378	4387	4378	4387	
Shale	4387	5045	4387	5045	
Java Shale	5045	5216	5045	5216	
Pipe Creek Shale	5216	5273	5216	5273	
Angola Shale	5273	5898	5273	5916	
Rhinestreet	5898	6314	5916	6339	
Cashaqua	6314	6405	6339	6436	
Middlesex	6405	6440	6436	6475	
West River	6440	6492	6475	6537	
Burkett	6492	6515	6537	6565	
Tully Limestone	6515	6545	6565	6605	
Hamilton	6545	6656	6605	6820	
Marcellus	6656	6706	6820	not encountered	Gas

Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date:	4/7/2014
Job End Date:	5/15/2014
State:	West Virginia
County:	Marshall
API Number:	47-051-01657-00-00
Operator Name:	Noble Energy, Inc
Well Name and Number:	SHL26 F
Longitude:	-80.54839200
Latitude:	39.97306100
Datum:	NAD27
Federal/Tribal Well:	NO
True Vertical Depth:	6,644
Total Base Water Volume (gal):	15,480,444
Total Base Non Water Volume:	0

Frac Focus
Chemical Disclosure Registry

GROUNDWATER PROTECTION COUNCIL

Oil & Gas

51-01657

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
Fresh Water	Operator	Base Fluid					
			Fresh Water	7732-18-5	100.00000	89.98980	Density = 8.340
SAND - PREMIUM WHITE	Halliburton	Proppant					
			Crystalline silica, quartz	14808-60-7	100.00000	6.92758	
SAND - COMMON WHITE	Halliburton	Proppant					
			Crystalline silica, quartz	14808-60-7	100.00000	1.78628	
HYDROCHLORIC ACID 5-10%	Halliburton	Solvent					
			Hydrochloric acid	7647-01-0	10.00000	0.11397	
LGC-36 UC	Halliburton	Liquid Gel Concentrate					
			Naphtha, hydrotreated heavy	64742-48-9	60.00000	0.01305	
			Guar gum	9000-30-0	60.00000	0.01305	
PermVis VFR-10	Halliburton	Friction Reducer					
			Hydrotreated light petroleum distillate	64742-47-8	30.00000	0.00745	
			Ammonium chloride	12125-02-9	10.00000	0.00248	
			Alcohols, C12-16, ethoxylated	68551-12-2	10.00000	0.00248	
			9-Octadecenamide, n,n-bis-2 (hydroxy-ethyl)-,(Z)	93-83-4	5.00000	0.00124	
FR-66	Halliburton	Friction Reducer					

			Hydrotreated light petroleum distillate	64742-47-8	30.00000	0.01062	
FE-1A ACIDIZING COMPOSITION	Halliburton	Additive					
			Acetic anhydride	108-24-7	100.00000	0.00591	
			Acetic acid	64-19-7	60.00000	0.00355	
BE-9	Halliburton	Biocide					
			Tributyl tetradecyl phosphonium chloride	81741-28-8	10.00000	0.00407	
LP-65	Halliburton	Scale Inhibitor					
			Ammonium chloride	12125-02-9	10.00000	0.00248	
LOSURF-300 NONIONIC SURFACTANT	Halliburton	Surfactant					
			Isopropanol	67-63-0	60.00000	0.00120	
			Light aromatic solvent	64742-95-6	30.00000	0.00060	
			Ethoxylated nonylphenol	Confidential	10.00000	0.00020	Denise Tuck, Halliburton 3000 N. Sam Houston Pkwy E., Houston, TX 77032 281-871-6226
HAI-OS ACID INHIBITOR	Halliburton	Corrosion Inhibitor					
			Methanol	67-56-1	60.00000	0.00059	
			Propargyl alcohol	107-19-7	10.00000	0.00010	
SP BREAKER	Halliburton	Breaker					
			Sodium persulfate	7775-27-1	100.00000	0.00036	
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 Ingredient(s)					
			Water	7732-18-5		1.22390	
		Other Ingredient(s)					
			Organic phosphonate	Confidential		0.01488	
		Other Ingredient(s)					
			Polyacrylamide copolymer	Confidential		0.01062	
		Other Ingredient(s)					
			Inorganic salt	Confidential		0.00745	
		Other Ingredient(s)					
			Polyacrylate	Confidential		0.00745	
		Other Ingredient(s)					
			Fatty acid tall oil amide	Confidential		0.00177	
		Other Ingredient(s)					
			Sodium chloride	7647-14-5		0.00177	
		Other Ingredient(s)					
			Ammonium chloride	12125-02-9		0.00177	
		Other Ingredient(s)					
			Alcohols, C12-16, ethoxylated	68551-12-2		0.00177	
		Other Ingredient(s)					
			Fatty acid ester	Confidential		0.00124	

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		Other Ingredient(s)					
			Formaldehyde polymer with methyl oxirane, 4-nonylphenol and oxirane	63428-92-2		0.00120	
		Other Ingredient(s)					
			Quaternary ammonium compounds, bis(hydrogenated tallow alkyl) dimethyl,salts with bentonite	68953-58-2		0.00109	
		Other Ingredient(s)					
			Formaldehyde polymer with 4,1,1-dimethylethyl phenolmethyl oxirane	29316-47-0		0.00060	
		Other Ingredient(s)					
			Sorbitan, mono-9-octadecenoate, (Z)	1338-43-8		0.00036	
		Other Ingredient(s)					
			Sorbitan monooleate polyoxyethylene derivative	9005-65-6		0.00036	
		Other Ingredient(s)					
			Reaction product of acetophenone, formaldehyde, thiourea and oleic acid in dimethyl formamide	68527-49-1		0.00029	
		Other Ingredient(s)					
			Fatty acids, tall oil	Confidential		0.00029	
		Other Ingredient(s)					
			Alcohols, C14-C15, ethoxylated	68951-67-7		0.00029	
		Other Ingredient(s)					
			Formaldehyde	50-00-0		0.00025	
		Other Ingredient(s)					
			Fatty alcohol polyglycol ether surfactant	9043-30-5		0.00022	
		Other Ingredient(s)					
			Naphthalene	91-20-3		0.00010	
		Other Ingredient(s)					
			Olefins	Confidential		0.00005	
		Other Ingredient(s)					
			Olefins	Confidential		0.00005	
		Other Ingredient(s)					
			Crystalline silica, quartz	14808-60-7		0.00002	
		Other Ingredient(s)					
			Olefins	Confidential		0.00001	
		Other Ingredient(s)					
			Olefins	Confidential		0.00001	
		Other Ingredient(s)					
			Sodium sulfate	7757-82-6		0.00000	

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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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PATHFINDER

noble energy

Noble Energy SHL-26F-HS Gyro+MWD 0ft to 14040ft MD Survey Report

(Def Survey)

Report Date:	November 22, 2013 - 10:11 AM
Client:	Noble Energy
Field:	WV Marshall County (NAD 27)
Structure / Slot:	Noble Energy SHL-26 Pad / SHL-26F-HS
Well:	SHL-26F-HS
Borehole:	Original Borehole
UWI / API#:	Unknown / Unknown
Survey Name:	Noble Energy SHL-26F-HS Gyro+MWD 0ft to 14040ft MD
Survey Date:	November 12, 2013
Tort / AHD / DDI / ERD Ratio:	235.010 ° / 7758.503 ft / 6.583 / 1.161
Coordinate Reference System:	NAD27 West Virginia State Plane, Northern Zone, US Feet
Location Lat / Long:	N 39° 58' 23.02310", W 80° 32' 54.20712"
Location Grid N/E Y/X:	N 538244.707 ftUS, E 1706175.259 ftUS
CRS Grid Convergence Angle:	-0.6686 °
Grid Scale Factor:	0.99995905
Version / Patch:	2.7.998.0

Survey / DLS Computation:	Minimum Curvature / Lubinski
Vertical Section Azimuth:	325.908 ° (Grid North)
Vertical Section Origin:	0.000 ft, 0.000 ft
TVD Reference Datum:	KB
TVD Reference Elevation:	1332.000 ft above MSL
Seabed / Ground Elevation:	1309.180 ft above MSL
Magnetic Declination:	-8.412 °
Total Gravity Field Strength:	999.3443mgn (9.80665 Based)
Gravity Model:	GARM
Total Magnetic Field Strength:	53138.108 nT
Magnetic Dip Angle:	67.518 °
Declination Date:	November 12, 2013
Magnetic Declination Model:	HDGM 2013
North Reference:	Grid North
Grid Convergence Used:	-0.6686 °
Total Corr Mag North->Grid North:	-7.7437 °
Local Coord Referenced To:	Well Head

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Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	TVDSS (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	BR (°/100ft)	TR (°/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ' ")	Longitude (E/W ° ' ")	Directional Difficulty Index
SHL	0.00	0.00	0.00	0.00	-1332.00	0.00	0.00	0.00	N/A	N/A	N/A	538244.71	1706175.26	N 39 58 23.02	W 80 32 54.21	0.00
	100.00	0.69	149.13	100.00	-1232.00	-0.60	-0.52	0.31	0.69	0.69	0.00	538244.19	1706175.57	N 39 58 23.02	W 80 32 54.20	0.00
	200.00	1.28	160.77	199.98	-1132.02	-2.28	-2.09	0.99	0.62	0.59	11.64	538242.62	1706176.24	N 39 58 23.00	W 80 32 54.19	0.48
	300.00	0.80	167.59	299.97	-1032.03	-4.01	-3.82	1.50	0.49	-0.48	6.82	538240.88	1706176.76	N 39 58 22.99	W 80 32 54.19	0.87
	400.00	0.83	154.48	399.96	-932.10	-5.38	-5.16	1.97	0.19	0.03	-13.11	538239.55	1706177.22	N 39 58 22.97	W 80 32 54.18	1.04
	500.00	0.50	144.06	499.95	-832.11	-6.53	-6.17	2.53	0.35	-0.33	-10.42	538238.54	1706177.79	N 39 58 22.96	W 80 32 54.17	1.20
	600.00	0.16	169.48	599.95	-732.11	-7.09	-6.66	2.82	0.36	-0.34	25.42	538238.05	1706178.07	N 39 58 22.96	W 80 32 54.17	1.29
	700.00	0.27	285.02	699.95	-632.11	-7.04	-6.73	2.61	0.37	0.11	115.54	538237.97	1706177.87	N 39 58 22.96	W 80 32 54.17	1.37
	800.00	0.28	290.41	799.95	-532.11	-6.66	-6.59	2.16	0.03	0.01	5.39	538238.12	1706177.42	N 39 58 22.96	W 80 32 54.18	1.40
	900.00	0.23	292.68	899.94	-432.12	-6.30	-6.42	1.74	0.05	-0.05	2.27	538238.28	1706177.00	N 39 58 22.96	W 80 32 54.18	1.43
	1000.00	0.14	289.11	999.94	-332.12	-6.03	-6.31	1.44	0.09	-0.09	-3.57	538238.40	1706176.70	N 39 58 22.96	W 80 32 54.19	1.46
	1100.00	0.12	302.49	1099.94	-232.12	-5.84	-6.21	1.24	0.04	-0.02	13.38	538238.50	1706176.50	N 39 58 22.96	W 80 32 54.19	1.47
	1200.00	0.45	318.93	1199.94	-132.12	-5.35	-5.86	0.89	0.34	0.33	16.44	538238.85	1706176.15	N 39 58 22.97	W 80 32 54.19	1.54
	1300.00	0.48	320.52	1299.94	-32.12	-4.55	-5.24	0.37	0.03	0.03	1.59	538239.47	1706175.63	N 39 58 22.97	W 80 32 54.20	1.58
	1400.00	0.49	325.03	1399.94	67.88	-3.70	-4.57	-0.14	0.04	0.01	4.51	538240.14	1706175.12	N 39 58 22.98	W 80 32 54.21	1.61
	1500.00	0.60	339.75	1499.93	167.87	-2.76	-3.72	-0.57	0.18	0.11	14.72	538240.98	1706174.69	N 39 58 22.99	W 80 32 54.21	1.67
	1600.00	0.60	318.52	1599.93	267.87	-1.74	-2.84	-1.10	0.22	0.00	-21.23	538241.87	1706174.16	N 39 58 22.99	W 80 32 54.22	1.73
	1700.00	0.67	312.34	1699.92	367.86	-0.65	-2.05	-1.88	0.10	0.07	-6.18	538242.65	1706173.38	N 39 58 23.00	W 80 32 54.23	1.78
	1800.00	0.48	324.52	1799.91	467.85	0.34	-1.32	-2.55	0.22	-0.19	12.18	538243.39	1706172.71	N 39 58 23.01	W 80 32 54.24	1.83
	1900.00	0.58	323.97	1899.91	567.85	1.26	-0.57	-3.09	0.10	0.10	-0.55	538244.14	1706172.17	N 39 58 23.02	W 80 32 54.25	1.86
	2000.00	0.64	328.22	1999.90	667.84	2.33	0.31	-3.69	0.08	0.06	4.25	538245.02	1706171.57	N 39 58 23.03	W 80 32 54.25	1.90
	2100.00	0.30	329.27	2099.90	767.84	3.15	1.01	-4.11	0.34	-0.34	1.05	538245.72	1706171.15	N 39 58 23.03	W 80 32 54.26	1.95
	2200.00	0.33	314.93	2199.90	867.84	3.69	1.44	-4.45	0.08	0.03	-14.34	538246.15	1706170.81	N 39 58 23.04	W 80 32 54.26	1.97
	2300.00	0.54	316.17	2299.90	967.84	4.44	1.99	-4.98	0.21	0.21	1.24	538246.69	1706170.28	N 39 58 23.04	W 80 32 54.27	2.00
	2400.00	0.79	328.15	2399.89	1067.83	5.59	2.91	-5.67	0.28	0.25	11.98	538247.62	1706169.59	N 39 58 23.05	W 80 32 54.28	2.05
	2500.00	0.64	323.39	2499.88	1167.82	6.84	3.95	-6.37	0.16	-0.15	-4.76	538248.65	1706168.89	N 39 58 23.06	W 80 32 54.29	2.09
	2600.00	0.48	314.17	2599.88	1267.82	7.80	4.69	-7.00	0.18	-0.16	-9.22	538249.39	1706168.26	N 39 58 23.07	W 80 32 54.30	2.12
	2700.00	0.40	303.50	2699.87	1367.81	8.54	5.17	-7.59	0.11	-0.08	-10.67	538249.88	1706167.67	N 39 58 23.07	W 80 32 54.31	2.15
	2800.00	0.44	303.32	2799.87	1467.81	9.22	5.57	-8.20	0.04	0.04	-0.18	538250.28	1706167.05	N 39 58 23.08	W 80 32 54.31	2.16
	2900.00	0.40	294.36	2899.87	1567.81	9.87	5.93	-8.84	0.08	-0.04	-8.96	538250.64	1706166.42	N 39 58 23.08	W 80 32 54.32	2.18
	3000.00	0.37	290.05	2999.87	1667.81	10.43	6.18	-9.46	0.04	-0.03	-4.31	538250.89	1706165.79	N 39 58 23.08	W 80 32 54.33	2.20
	3100.00	0.36	281.54	3099.86	1767.80	10.91	6.36	-10.08	0.06	-0.01	-8.51	538251.06	1706165.18	N 39 58 23.08	W 80 32 54.34	2.21
	3190.00	0.42	288.96	3189.86	1857.80	11.38	6.52	-10.67	0.09	0.07	8.24	538251.23	1706164.59	N 39 58 23.09	W 80 32 54.35	2.23
	3298.00	0.06	201.68	3297.86	1965.80	11.66	6.60	-11.06	0.39	-0.33	-80.81	538251.30	1706164.20	N 39 58 23.09	W 80 32 54.35	2.26
	3392.00	0.15	245.04	3391.86	2059.80	11.65	6.50	-11.19	0.12	0.10	46.13	538251.21	1706164.07	N 39 58 23.09	W 80 32 54.35	2.27
	3487.00	0.12	232.82	3486.86	2154.80	11.67	6.39	-11.38	0.04	-0.03	-12.86	538251.09	1706163.88	N 39 58 23.08	W 80 32 54.35	2.28
	3582.00	0.14	245.75	3581.86	2249.80	11.68	6.28	-11.57	0.04	0.02	13.61	538250.99	1706163.69	N 39 58 23.08	W 80 32 54.36	2.28
	3676.00	0.25	231.65	3675.86	2343.80	11.69	6.10	-11.83	0.13	0.12	-15.00	538250.81	1706163.43	N 39 58 23.08	W 80 32 54.36	2.30
	3771.00	0.31	210.94	3770.86	2438.80	11.60	5.78	-12.16	0.09	0.06	-12.33	538250.49	1706163.10	N 39 58 23.08	W 80 32 54.36	2.31

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	TVDSS (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	BR (°/100ft)	TR (°/100ft)	Northing (RUS)	Easting (RUS)	Latitude (N/S ° ' ")	Longitude (E/W ° ' ")	Directional Difficulty Index
	3866.00	0.39	239.14	3865.86	2533.80	11.55	5.42	-12.60	0.15	0.08	20.21	538250.12	1706162.66	N 39 58 23.08	W 80 32 54.37	2.32
	3960.00	0.33	238.83	3959.86	2627.80	11.58	5.11	-13.11	0.06	-0.06	-0.33	538249.82	1706162.15	N 39 58 23.07	W 80 32 54.38	2.34
	4055.00	0.15	262.97	4054.85	2722.79	11.65	4.95	-13.47	0.21	-0.19	25.41	538249.66	1706161.79	N 39 58 23.07	W 80 32 54.38	2.35
	4149.00	0.19	316.91	4148.85	2816.79	11.88	5.05	-13.70	0.17	0.04	57.38	538249.76	1706161.56	N 39 58 23.07	W 80 32 54.38	2.37
	4244.00	0.23	246.90	4243.85	2911.79	12.05	5.09	-13.98	0.26	0.04	-73.69	538249.80	1706161.28	N 39 58 23.07	W 80 32 54.39	2.39
	4339.00	0.37	211.51	4338.85	3006.79	11.96	4.76	-14.31	0.24	0.15	-37.25	538249.46	1706160.95	N 39 58 23.07	W 80 32 54.39	2.40
	4433.00	0.24	147.62	4432.85	3100.79	11.64	4.33	-14.37	0.36	-0.14	-67.97	538249.04	1706160.89	N 39 58 23.06	W 80 32 54.39	2.43
	4528.00	0.53	107.02	4527.85	3195.79	11.10	4.04	-13.84	0.40	0.31	-42.74	538248.74	1706161.42	N 39 58 23.06	W 80 32 54.39	2.46
	4622.00	0.50	115.98	4621.85	3289.79	10.41	3.73	-13.06	0.09	-0.03	9.53	538248.44	1706162.20	N 39 58 23.06	W 80 32 54.38	2.47
	4717.00	0.30	109.20	4716.84	3384.78	9.81	3.45	-12.40	0.16	-0.15	-7.14	538248.16	1706162.86	N 39 58 23.06	W 80 32 54.37	2.49
	4812.00	0.15	122.34	4811.84	3479.78	9.45	3.28	-12.01	0.23	-0.22	13.83	538247.99	1706163.25	N 39 58 23.05	W 80 32 54.36	2.50
	4906.00	0.10	114.65	4905.84	3573.78	9.21	3.15	-11.77	0.05	0.04	-8.18	538247.86	1706163.49	N 39 58 23.05	W 80 32 54.36	2.51
	4998.00	0.07	183.68	4995.84	3663.78	9.04	3.04	-11.64	0.20	-0.13	76.70	538247.74	1706163.62	N 39 58 23.05	W 80 32 54.36	2.52
	5091.00	0.17	257.69	5090.84	3758.78	9.04	2.95	-11.78	0.17	0.11	77.91	538247.66	1706163.48	N 39 58 23.05	W 80 32 54.36	2.53
	5185.00	0.40	329.25	5184.84	3852.78	9.42	3.20	-12.08	0.41	0.24	76.13	538247.91	1706163.18	N 39 58 23.05	W 80 32 54.36	2.55
	5280.00	0.65	295.39	5279.84	3947.78	10.22	3.72	-12.74	0.41	0.26	-35.64	538248.42	1706162.52	N 39 58 23.06	W 80 32 54.37	2.58
	5327.00	0.64	279.91	5326.83	3994.77	10.63	3.88	-13.24	0.37	-0.02	-32.94	538248.58	1706162.02	N 39 58 23.06	W 80 32 54.38	2.59
	5375.00	0.14	108.95	5374.83	4042.77	10.77	3.90	-13.45	1.62	-1.04	-356.17	538248.61	1706161.81	N 39 58 23.06	W 80 32 54.38	2.62
	5422.00	3.74	106.74	5421.80	4089.74	9.54	3.44	-11.92	7.66	7.66	-4.70	538248.15	1706163.34	N 39 58 23.06	W 80 32 54.36	2.76
	5470.00	7.00	110.48	5469.58	4137.52	5.94	1.97	-7.68	6.83	6.79	7.79	538246.68	1706167.58	N 39 58 23.04	W 80 32 54.31	2.90
	5517.00	9.01	109.37	5516.08	4184.02	0.45	-0.34	-1.30	5.56	5.55	-2.36	538244.37	1706173.96	N 39 58 23.02	W 80 32 54.22	3.02
	5564.00	11.97	113.65	5562.25	4230.19	-6.83	-3.61	6.86	5.33	5.02	9.53	538241.10	1706182.12	N 39 58 22.99	W 80 32 54.12	3.14
	5611.00	14.74	121.66	5607.98	4275.92	-16.43	-8.74	16.40	7.07	5.89	17.04	538235.97	1706191.66	N 39 58 22.94	W 80 32 54.00	3.27
	5659.00	16.63	128.76	5654.19	4322.13	-28.57	-16.26	26.94	5.53	3.94	14.38	538228.45	1706202.20	N 39 58 22.87	W 80 32 53.86	3.38
	5706.00	19.36	130.48	5699.69	4366.83	-42.51	-25.53	38.12	5.82	5.81	3.66	538219.18	1706213.37	N 39 58 22.78	W 80 32 53.71	3.49
	5753.00	19.22	125.40	5743.26	4411.20	-57.26	-35.07	50.35	3.58	-0.30	-10.81	538209.64	1706225.61	N 39 58 22.68	W 80 32 53.56	3.58
	5800.00	18.11	124.12	5787.78	4455.72	-71.29	-43.65	62.70	2.52	-2.36	-2.72	538201.06	1706237.90	N 39 58 22.60	W 80 32 53.40	3.65
	5848.00	17.83	128.38	5833.44	4501.38	-85.23	-52.40	74.64	2.60	-0.58	8.88	538192.31	1706249.90	N 39 58 22.51	W 80 32 53.24	3.71
	5895.00	19.23	125.32	5878.01	4545.95	-99.34	-61.34	86.60	3.63	2.98	-6.51	538183.37	1706261.85	N 39 58 22.43	W 80 32 53.09	3.78
	5943.00	17.17	122.24	5923.60	4591.54	-113.23	-69.69	99.04	4.74	-4.29	-6.42	538175.02	1706274.30	N 39 58 22.35	W 80 32 52.92	3.84
	5990.00	10.82	115.86	5969.19	4637.13	-123.41	-75.32	108.89	13.88	-13.51	-13.57	538169.39	1706284.14	N 39 58 22.29	W 80 32 52.80	3.94
	6038.00	6.30	110.19	6016.64	4684.58	-129.45	-78.20	115.42	9.57	-9.42	-11.81	538166.51	1706290.67	N 39 58 22.26	W 80 32 52.71	3.99
	6085.00	4.37	83.27	6063.44	4731.38	-132.37	-78.88	119.02	6.02	-4.11	-57.28	538165.83	1706294.87	N 39 58 22.26	W 80 32 52.66	4.03
	6132.00	6.04	55.85	6110.25	4778.19	-133.19	-77.28	123.44	6.28	3.55	-58.34	538167.43	1706298.70	N 39 58 22.27	W 80 32 52.61	4.06
	6179.00	8.48	32.87	6156.88	4824.82	-131.83	-72.98	127.37	7.97	5.19	-48.89	538171.73	1706302.63	N 39 58 22.32	W 80 32 52.56	4.10
	6227.00	8.42	2.32	6204.39	4872.33	-127.62	-66.49	129.44	9.25	-0.13	-63.65	538178.22	1706304.69	N 39 58 22.38	W 80 32 52.53	4.15
	6274.00	10.15	335.62	6250.79	4918.73	-120.76	-59.28	127.87	8.77	3.68	-56.81	538185.43	1706303.12	N 39 58 22.45	W 80 32 52.56	4.19
	6322.00	13.71	333.66	6297.75	4965.69	-110.95	-50.32	123.59	7.46	7.42	-4.08	538194.38	1706298.85	N 39 58 22.54	W 80 32 52.61	4.23
	6372.00	18.61	331.93	6345.76	5013.70	-97.14	-37.97	117.21	9.85	9.80	-3.46	538206.74	1706292.46	N 39 58 22.66	W 80 32 52.70	4.28
	6416.00	22.88	327.49	6388.88	5054.82	-81.56	-24.52	109.28	10.55	9.93	-10.09	538220.19	1706284.54	N 39 58 22.79	W 80 32 52.80	4.34
	6463.00	27.80	323.45	6429.33	5097.27	-61.43	-7.97	97.82	10.69	10.26	-8.60	538236.74	1706273.07	N 39 58 22.96	W 80 32 52.95	4.40
	6511.00	32.28	321.06	6470.88	5138.82	-37.46	11.00	83.09	9.66	9.33	-4.98	538255.71	1706258.34	N 39 58 23.14	W 80 32 53.14	4.45
	6558.00	37.35	319.03	6509.45	5177.39	-10.77	31.64	65.95	10.93	10.79	-3.04	538276.35	1706241.21	N 39 58 23.34	W 80 32 53.36	4.51
	6580.00	39.99	319.55	6526.63	5194.57	2.90	42.11	57.04	12.00	12.00	-0.36	538286.81	1706232.30	N 39 58 23.45	W 80 32 53.48	4.54
	6606.00	43.45	319.03	6546.03	5213.97	20.08	55.22	45.76	13.37	13.31	-2.00	538299.92	1706221.01	N 39 58 23.57	W 80 32 53.63	4.58
	6653.00	50.76	317.56	6578.00	5245.94	54.18	80.89	22.85	15.72	15.55	-3.13	538325.59	1706198.11	N 39 58 23.83	W 80 32 53.93	4.65
	6700.00	57.73	318.20	6605.45	5273.39	91.93	109.18	-2.70	14.88	14.83	1.49	538353.88	1706172.56	N 39 58 24.10	W 80 32 54.26	4.72
	6748.00	63.72	321.45	6628.91	5296.85	133.54	141.19	-29.65	13.76	12.48	6.65	538385.89	1706145.61	N 39 58 24.41	W 80 32 54.61	4.78
	6795.00	69.20	326.26	6647.69	5315.63	176.57	175.98	-55.01	14.96	11.66	10.23	538420.68	1706120.25	N 39 58 24.70	W 80 32 54.94	4.85
	6820.00	71.32	329.98	6656.13	5324.07	200.08	195.96	-67.43	16.37	8.48	14.88	538440.68	1706107.83	N 39 58 24.95	W 80 32 55.10	4.88
	6889.00	79.14	335.15	6673.72	5341.66	266.26	255.13	-98.00	13.45	11.33	7.49	538499.83	1706077.18	N 39 58 25.53	W 80 32 55.51	4.96
	6937.00	83.42	334.51	6681.00	5348.94	313.12	298.06	-118.26	9.01	8.92	-1.33	538542.75	1706057.00	N 39 58 25.95	W 80 32 55.77	5.01
	6983.00	88.76	332.80	6684.13	5352.07	358.58	339.17	-138.62	12.19	11.61	-3.72	538583.86	1706036.64	N 39 58 26.36	W 80 32 56.04	5.06
	7052.00	91.72	327.40	6683.84	5351.78	427.38	398.96	-173.00	8.92	4.29	-7.83	538643.65	1706002.26	N 39 58 26.95	W 80 32 56.40	5.12
	7185.00	90.48	328.02	6681.29	5349.23	560.27	511.37	-244.04	1.04	-0.93	0.47	538756.05	1705931.23	N 39 58 28.05	W 80 32 57.42	5.20
	7280.00	90.52	328.79	6680.46	5348.40	655.17	592.28	-293.81	0.81	0.04	0.81	538836.96	1705881.47	N 39 58 28.84	W 80 32 58.07	5.25
	7374.00	90.41	328.00	6679.70	5347.64	749.08	672.36	-343.02	0.79	-0.12	-0.78	538917.04	1705832.25	N 39 58 29.63	W 80 32 58.71	5.30
	7468.00	90.69	328.24	6678.60	5346.74	843.00	752.20	-392.62	0.35	0.30	0.19	538996.88	1705782.65	N 39 58 30.41	W 80 32 59.30	5.34
	7563.00	90.52	328.83	6677.79	5345.73	937.90	833.23	-442.21	0.65	-0.18	0.62	539077.90	1705733.07	N 39 58 31.21	W 80 33 0.01	5.38
	7658.00	90.38	327.49	6677.05	5344.99	1032.82	913.93	-492.32	1.42	-0.15	-1.41	539158.60	1705682.96	N 39 58 32.00	W 80 33 0.67	5.42
	7752.00	89.93	327.68	6676.70	5344.73	1126.78	993.28	-542.71	0.52	-0.48	0.20	539237.95	1705632.57	N 39 58 32.78	W 80 33 1.33	5.46
	7847.00	90.00	327.08	6676.85	5344.79	1221.75	1073.30	-593.92	0.64	0.07	-0.63	539317.96	1705581.36	N 39 58 33.56	W 80 33 2.00	5.49

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Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	TVDSS (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	BR (°/100ft)	TR (°/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ' ")	Longitude (E/W ° ' ")	Directional Difficulty Index
	7941.00	89.90	325.71	6676.93	5344.87	1315.74	1151.59	-645.95	1.46	-0.11	-1.46	539398.24	1705529.34	N 39 58 34.33	W 80 33 2.68	5.52
	8036.00	90.00	325.11	6677.01	5344.95	1410.74	1229.79	-699.88	0.64	0.11	-0.63	539474.45	1705475.41	N 39 58 35.09	W 80 33 3.38	5.56
	8131.00	90.03	325.59	6676.99	5344.93	1505.73	1307.94	-753.89	0.51	0.03	0.51	539552.59	1705421.40	N 39 58 35.86	W 80 33 4.09	5.58
	8226.00	90.03	325.37	6676.94	5344.88	1600.73	1388.22	-807.73	0.23	0.00	-0.23	539630.88	1705367.57	N 39 58 38.63	W 80 33 4.79	5.61
	8320.00	90.07	325.04	6676.86	5344.80	1694.72	1463.41	-861.37	0.35	0.04	-0.35	539709.05	1705313.93	N 39 58 37.38	W 80 33 5.49	5.64
	8415.00	89.86	325.27	6676.92	5344.86	1789.71	1541.38	-915.65	0.33	-0.22	0.24	539788.02	1705259.65	N 39 58 38.15	W 80 33 6.20	5.66
	8510.00	89.88	325.32	6677.15	5345.09	1884.71	1619.47	-969.73	0.05	0.00	0.05	539864.11	1705205.57	N 39 58 38.91	W 80 33 6.91	5.69
	8604.00	90.00	325.40	6677.26	5345.20	1978.70	1696.61	-1023.17	0.17	0.15	0.09	539941.45	1705152.14	N 39 58 39.67	W 80 33 7.60	5.71
	8699.00	90.10	325.57	6677.18	5345.12	2073.70	1775.09	-1077.00	0.21	0.11	0.18	540019.72	1705098.31	N 39 58 40.44	W 80 33 8.31	5.73
	8794.00	90.03	325.09	6677.07	5345.01	2168.70	1853.22	-1131.04	0.51	-0.07	-0.51	540097.85	1705044.27	N 39 58 41.21	W 80 33 9.01	5.76
	8888.00	89.69	323.33	6677.30	5345.24	2262.65	1929.47	-1186.01	1.91	-0.36	-1.87	540174.09	1704989.30	N 39 58 41.95	W 80 33 9.73	5.78
	8983.00	89.90	323.41	6677.64	5345.58	2357.56	2005.71	-1242.69	0.24	0.22	0.03	540250.33	1704932.63	N 39 58 42.70	W 80 33 10.47	5.80
	9078.00	90.07	323.42	6677.67	5345.01	2452.47	2081.99	-1299.31	0.18	0.18	0.01	540326.61	1704876.01	N 39 58 43.45	W 80 33 11.21	5.82
	9172.00	89.93	323.25	6677.87	5345.01	2546.37	2157.39	-1355.44	0.23	-0.15	-0.18	540402.00	1704819.88	N 39 58 44.19	W 80 33 11.94	5.84
	9267.00	90.00	323.75	6677.73	5345.67	2641.29	2233.75	-1411.95	0.53	0.07	0.53	540478.37	1704763.37	N 39 58 44.93	W 80 33 12.68	5.86
	9362.00	90.55	324.93	6677.27	5345.21	2736.25	2310.94	-1467.33	1.37	0.58	1.24	540555.55	1704707.99	N 39 58 45.69	W 80 33 13.40	5.88
	9456.00	90.14	324.07	6676.70	5344.64	2830.22	2387.46	-1521.91	1.01	-0.44	-0.91	540632.07	1704653.41	N 39 58 46.44	W 80 33 14.11	5.90
	9551.00	90.34	324.17	6676.31	5344.25	2925.17	2464.44	-1577.59	0.24	0.21	0.11	540709.04	1704597.74	N 39 58 47.19	W 80 33 14.84	5.92
	9645.00	90.34	324.16	6675.75	5343.69	3019.13	2540.64	-1632.82	0.01	0.00	-0.01	540785.24	1704542.71	N 39 58 47.94	W 80 33 15.56	5.94
	9740.00	90.69	324.45	6674.69	5342.83	3114.08	2617.79	-1688.05	0.48	0.37	0.31	540862.39	1704487.28	N 39 58 48.70	W 80 33 16.28	5.95
	9835.00	90.52	324.42	6673.69	5341.83	3209.05	2695.06	-1743.30	0.18	-0.18	-0.03	540939.66	1704432.03	N 39 58 49.45	W 80 33 17.00	5.97
	9929.00	90.45	324.78	6673.09	5341.03	3303.02	2771.67	-1797.76	0.37	-0.07	0.36	541016.26	1704377.57	N 39 58 50.20	W 80 33 17.71	5.99
	10023.00	90.24	324.54	6672.53	5340.47	3398.99	2848.34	-1852.15	0.32	-0.22	-0.23	541092.03	1704323.19	N 39 58 50.96	W 80 33 18.42	6.00
	10118.00	90.17	323.84	6672.19	5340.13	3491.95	2925.38	-1907.73	0.74	-0.07	-0.74	541169.90	1704267.61	N 39 58 51.71	W 80 33 19.15	6.02
	10212.00	90.41	323.61	6671.71	5339.65	3585.88	3001.16	-1963.35	0.35	0.26	-0.24	541245.74	1704212.00	N 39 58 52.45	W 80 33 19.88	6.03
	10307.00	90.38	323.91	6671.06	5339.00	3680.81	3077.78	-2019.51	0.32	-0.03	0.32	541322.38	1704155.84	N 39 58 53.20	W 80 33 20.61	6.05
	10401.00	90.45	324.14	6670.38	5338.32	3774.76	3153.85	-2074.72	0.26	0.07	0.24	541398.42	1704100.62	N 39 58 53.95	W 80 33 21.33	6.06
	10496.00	90.52	324.38	6669.57	5337.51	3869.72	3230.96	-2130.21	0.26	0.07	0.25	541475.53	1704045.14	N 39 58 54.70	W 80 33 22.05	6.08
	10591.00	90.89	326.04	6668.40	5336.34	3964.70	3308.97	-2184.41	1.79	0.39	1.75	541553.53	1703990.94	N 39 58 55.47	W 80 33 22.76	6.10
	10685.00	90.93	326.69	6666.91	5334.85	4058.68	3387.31	-2236.33	0.01	0.04	0.90	541631.87	1703939.02	N 39 58 56.24	W 80 33 23.44	6.11
	10780.00	89.86	326.37	6666.26	5334.20	4153.67	3466.65	-2288.59	1.25	-1.13	-0.55	541711.20	1703886.77	N 39 58 57.02	W 80 33 24.12	6.13
	10874.00	89.79	325.73	6666.54	5334.48	4247.67	3544.62	-2341.08	0.68	-0.07	-0.68	541789.18	1703834.28	N 39 58 57.78	W 80 33 24.81	6.14
	10969.00	89.52	325.75	6667.12	5335.06	4342.67	3623.14	-2394.56	0.28	-0.28	0.02	541867.09	1703780.80	N 39 58 58.55	W 80 33 25.51	6.15
	11064.00	89.52	325.29	6667.91	5335.85	4437.66	3701.44	-2448.34	0.48	0.00	-0.48	541945.99	1703727.02	N 39 58 59.32	W 80 33 26.21	6.17
	11158.00	90.62	328.76	6667.80	5335.74	4531.63	3780.29	-2499.49	3.67	1.17	3.69	542024.83	1703675.87	N 39 59 0.09	W 80 33 26.88	6.19
	11253.00	90.21	330.30	6667.11	5335.05	4626.43	3862.16	-2547.66	1.68	-0.43	1.62	542106.70	1703627.71	N 39 59 0.89	W 80 33 27.51	6.20
	11348.00	90.21	330.84	6666.76	5334.70	4721.12	3944.90	-2594.34	0.57	0.00	0.57	542189.44	1703581.03	N 39 59 1.71	W 80 33 28.12	6.22
	11442.00	90.34	332.55	6666.31	5334.25	4814.63	4027.66	-2638.91	1.82	0.14	1.82	542272.19	1703536.48	N 39 59 2.52	W 80 33 28.71	6.23
	11537.00	91.41	328.98	6664.66	5332.60	4909.26	4110.54	-2685.29	3.92	1.13	-3.76	542355.07	1703490.08	N 39 59 3.33	W 80 33 29.32	6.25
	11631.00	91.86	325.81	6662.17	5330.11	5003.18	4189.68	-2735.92	3.40	0.48	-3.37	542434.21	1703439.46	N 39 59 4.11	W 80 33 29.98	6.27
	11726.00	92.30	323.83	6658.73	5326.67	5098.10	4267.27	-2790.61	2.13	0.46	-2.08	542511.60	1703384.77	N 39 59 4.87	W 80 33 30.69	6.29
	11821.00	90.86	323.01	6656.11	5324.05	5192.97	4343.53	-2847.20	1.74	-1.52	-0.86	542588.05	1703328.18	N 39 59 5.62	W 80 33 31.43	6.30
	11916.00	90.21	323.33	6655.22	5323.16	5287.85	4419.56	-2904.15	0.76	-0.68	0.34	542664.08	1703271.23	N 39 59 6.38	W 80 33 32.18	6.31
	12013.00	89.93	324.09	6655.10	5323.04	5384.78	4497.75	-2961.56	0.83	-0.29	0.78	542742.26	1703213.83	N 39 59 7.13	W 80 33 32.92	6.33
	12105.00	89.76	324.03	6655.35	5323.29	5476.73	4572.23	-3015.56	0.20	-0.18	-0.07	542816.74	1703159.83	N 39 59 7.86	W 80 33 33.63	6.34
	12199.00	89.69	323.52	6655.80	5323.74	5570.67	4648.06	-3071.11	0.55	-0.07	-0.54	542892.57	1703104.28	N 39 59 8.60	W 80 33 34.35	6.35
	12294.00	89.73	323.91	6656.28	5324.22	5665.60	4724.64	-3127.33	0.41	0.04	0.41	542969.14	1703048.07	N 39 59 9.35	W 80 33 35.09	6.36
	12389.00	90.98	326.41	6655.71	5323.65	5760.58	4802.60	-3181.59	2.93	1.29	2.63	543047.10	1702993.80	N 39 59 10.11	W 80 33 35.80	6.38
	12483.00	89.45	324.41	6655.37	5323.31	5854.57	4879.98	-3234.95	2.67	-1.61	-2.13	543124.48	1702940.44	N 39 59 10.87	W 80 33 36.49	6.39
	12578.00	89.97	324.76	6655.65	5323.79	5949.54	4957.40	-3290.00	0.66	0.55	0.37	543201.89	1702885.40	N 39 59 11.63	W 80 33 37.21	6.40
	12673.00	90.58	325.49	6655.40	5323.34	6044.53	5035.34	-3344.32	1.00	0.64	0.77	543279.83	1702831.08	N 39 59 12.39	W 80 33 37.92	6.41
	12768.00	90.17	325.40	6654.78	5322.72	6139.52	5113.58	-3398.21	0.44	-0.43	-0.09	543358.06	1702777.20	N 39 59 13.16	W 80 33 38.63	6.42
	12862.00	90.76	327.66	6654.01	5321.95	6233.50	5192.07	-3449.90	2.69	0.63	2.62	543436.55	1702725.50	N 39 59 13.93	W 80 33 39.30	6.44
	12957.00	89.76	325.23	6653.58	5321.52	6328.49	5271.32	-3502.27	2.96	-1.05	-2.77	543515.80	1702673.14	N 39 59 14.71	W 80 33 39.99	6.45
	13051.00	90.55	326.36	6653.33	5321.27	6422.49	5349.06	-3555.11	1.47	0.84	1.20	543593.54	1702620.30	N 39 59 15.47	W 80 33 40.68	6.47
	13146.00	90.41	326.60	6652.53	5320.47	6517.48	5428.35	-3607.43	0.49	-0.15	0.46	543672.82	1702567.98	N 39 59 16.25	W 80 33 41.36	6.48
	13241.00	90.58	327.82	6651.71	5319.65	6612.44	5508.30	-3658.74	1.09	0.18	1.07	543752.77	1702516.68	N 39 59 17.03	W 80 33 42.03	6.49
	13335.00	91.17	327.23	6650.28	5318.22	6706.39	5587.59	-3709.20	0.89	0.63	-0.63	543832.05	1702466.21	N 39 59 17.81	W 80 33 42.69	6.50
	13430.00	90.21	325.38	6649.13	5317.07	6801.38	5666.62	-3761.90	2.19	-1.01	-1.95	543911.08	1702413.52	N 39 59 18.58	W 80 33 43.38	6.51
	13524.00	90.72	325.75	6648.37	5316.31	6895.37	5744.14	-3815.05	0.67	0.54	0.39	543988.60	1702360.37	N 39 59 19.34	W 80 33 44.08	6.52
	13619.00	90.10	325.62	6647.69	5315.63	6990.37	5822.61	-3868.61	0.67	-0.65	-0.14	544067.06	1702306.82	N 39 59 20.11	W 80 33 44.78	6.53
	13714.00	89.93	325.17	6647.66	5315.60	7085.37	5900.80	-3922.56	0.51	-0.18	-0.47	544145.25	1702252.87	N 39 59 20.88	W 80 33 45.48	6.54
	13808.00	90.96	327.75	6646.93	5314.87	7179.35	5979.14	-3974.49	2.96	1.10	2.74	544223.59	1702200.94	N 39 59 21.65	W 80 33 46.16	6.55

51-01657

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	TVDSS (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	BR (°/100ft)	TR (°/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ' ")	Longitude (E/W ° ' ")	Directional Difficulty Index
	13903.00	90.00	326.28	6646.14	5314.08	7274.32	6058.81	-4026.22	1.87	-1.01	-1.57	544303.26	1702149.21	N 39 59 22.43	W 80 33 46.84	6.56
	13939.00	90.00	326.30	6646.14	5314.08	7310.32	6088.75	-4046.20	0.11	0.00	0.11	544333.20	1702129.23	N 39 59 22.72	W 80 33 47.10	6.57
Final Survey 21-Nov-13	13997.00	91.37	329.51	6645.45	5313.39	7368.28	6137.88	-4077.01	6.02	2.36	5.53	544382.32	1702098.42	N 39 59 23.20	W 80 33 47.50	6.58
PTB	14040.00	91.37	320.51	6644.42	5312.36	7411.18	6174.92	-4098.82	0.00	0.00	0.00	544419.36	1702076.61	N 39 59 23.57	W 80 33 47.79	6.58

Survey Type: Def Survey

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

Survey Program:

Description	Part	MD From (ft)	MD To (ft)	EOU Freq (ft)	Hole Size (in)	Casing Diameter (in)	Survey Tool Type	Borehole / Survey
	1	0.000	22.880	Act Stns	30.000	30.000	SLB_NSG+MSHOT-Depth Only	Original Borehole / Noble Energy SHL-26F-HS Gyro+MWD 0ft to 14040ft MD
	1	22.880	3190.000	Act Stns	30.000	30.000	SLB_NSG+MSHOT	Original Borehole / Noble Energy SHL-26F-HS Gyro+MWD 0ft to
	1	3190.000	13997.000	Act Stns	30.000	30.000	SLB_MWD-STD	Original Borehole / Noble Energy SHL-26F-HS Gyro+MWD 0ft to
	1	13997.000	14040.000	Act Stns	30.000	30.000	SLB_BLIND+TREND	Original Borehole / Noble Energy SHL-26F-HS Gyro+MWD 0ft to

51-01657

51-01657

PATHFINDER
A Schlumberger Company

Noble Energy

noble energy

Borehole:	Well:	Field:	Structure:
Original Borehole	SHL-26F-HS	WV Marshall County (NAD 27)	Nabors M59

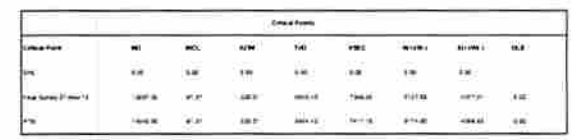
Gravity & Magnetic Parameters																			
Model:	HDGM 2013	Dip:	67.518°	Date:	11/12/2013	Surface Location		NAD27 West Virginia State Plane, Northern Zone, US Feet								Miscellaneous			
MagDec:	-8.412°	FS:	53138.108nT	Gravity FS:	999.344mgn (9.80665 Based)	Lat:	N 39 58 23.92	Northing:	538244.707ftUS	Grid Conv:	-0.665°					Slot:	SHL-26F-HS	TVD Ref:	KB(1332.0ft above MSL)
						Lon:	W 80 32 54.21	Easting:	1704175.259ftUS	Scale Fact:	1					Plan:	Noble Energy SHL-26F-HS Gyro+MWD 0ft to 14040ft MD		

Part	Sec.	Survey Tool Scale	Hole Size (in)	Casing Size (in)	MD From (ft)	MD To (ft)	Survey Frequency	Error Model (Base Model)	Error Scale (Base Model)	Comments Contingency
1	1	SLB_MWD-INCLINOMETER (Gyro)	36	30	0	30.00	Act Srvy		1.00	1.00
1	2	SLB_MWD-INCLINOMETER	36	30	30.00	2100	Act Srvy		0.50	0.50
1	3	SLB_MWD-STD	36	30	2100	13867	Act Srvy		20.00	0.50
1	4	SLB_BLIND+TREND	36	30	13867	14040	Act Srvy		604.7	1.00

Surface Location

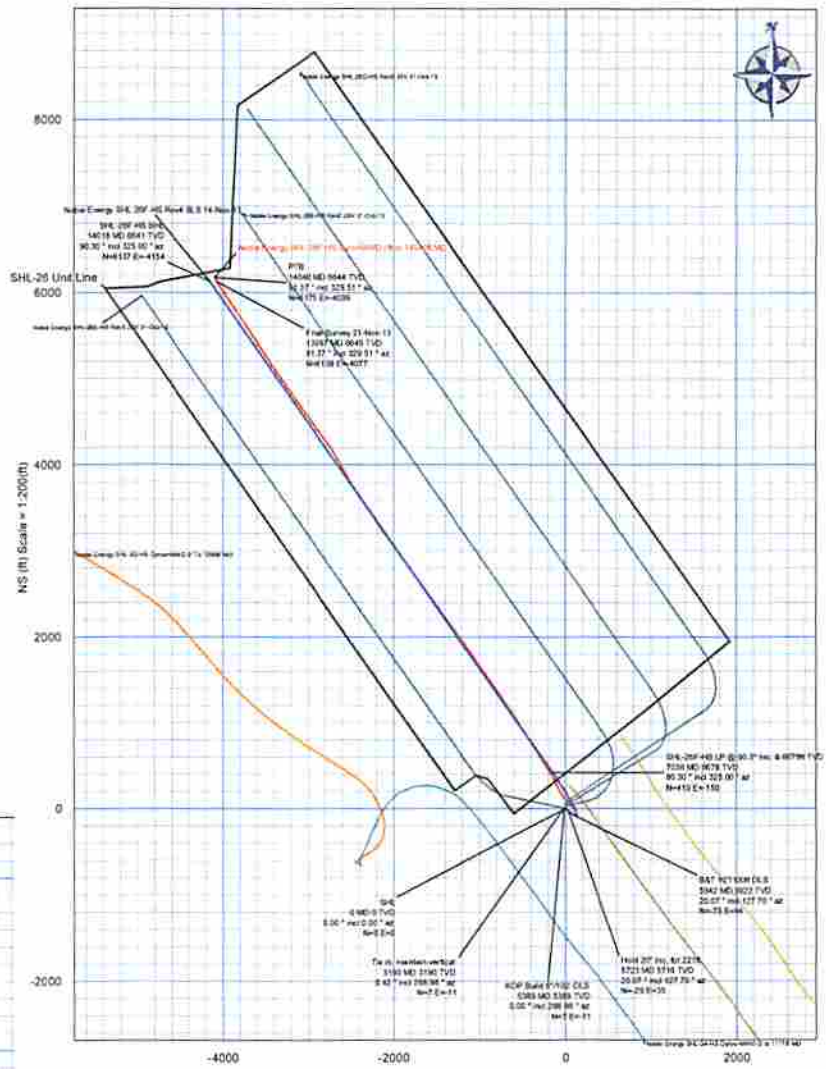
Northing: 538244.707 Easting: 1704175.259 Latitude: N 39 58 23.92 Longitude: W 80 32 54.21 Vertical Datum: 323.000

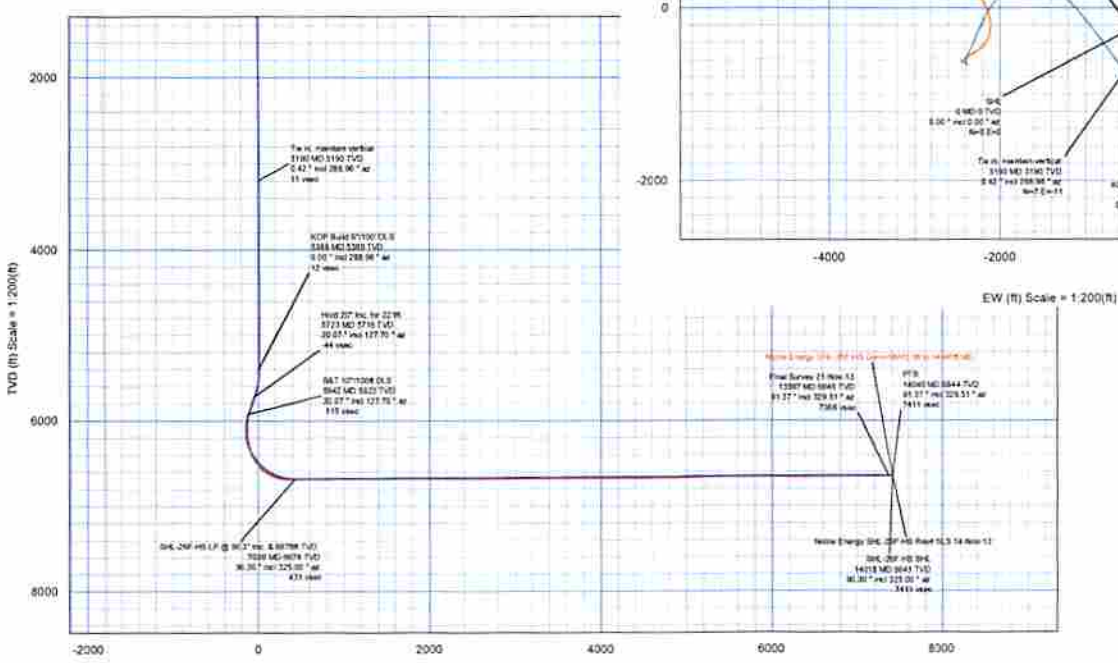
Target Name	Shape	Dip Angle	Latitude	Longitude	Northing	Easting	TVD	Vsec	Local Northing	Local Easting
SHL-26 Unit Line	Polygon	n/a	N 39 58 23.92	W 80 32 54.21	538244.707	1704175.259	1332.00	25.00	23.00	1.00
SHL-26F-HS BHL	Point	n/a	N 39 58 23.74	W 80 32 56.24	538240.88	1704000.00	6702.00	111.20	0.00	-174.00
SHL-26F-HS LP	Point	n/a	N 39 58 37.74	W 80 32 56.24	538669.23	1704000.23	6702.00	434.00	429.00	-174.00



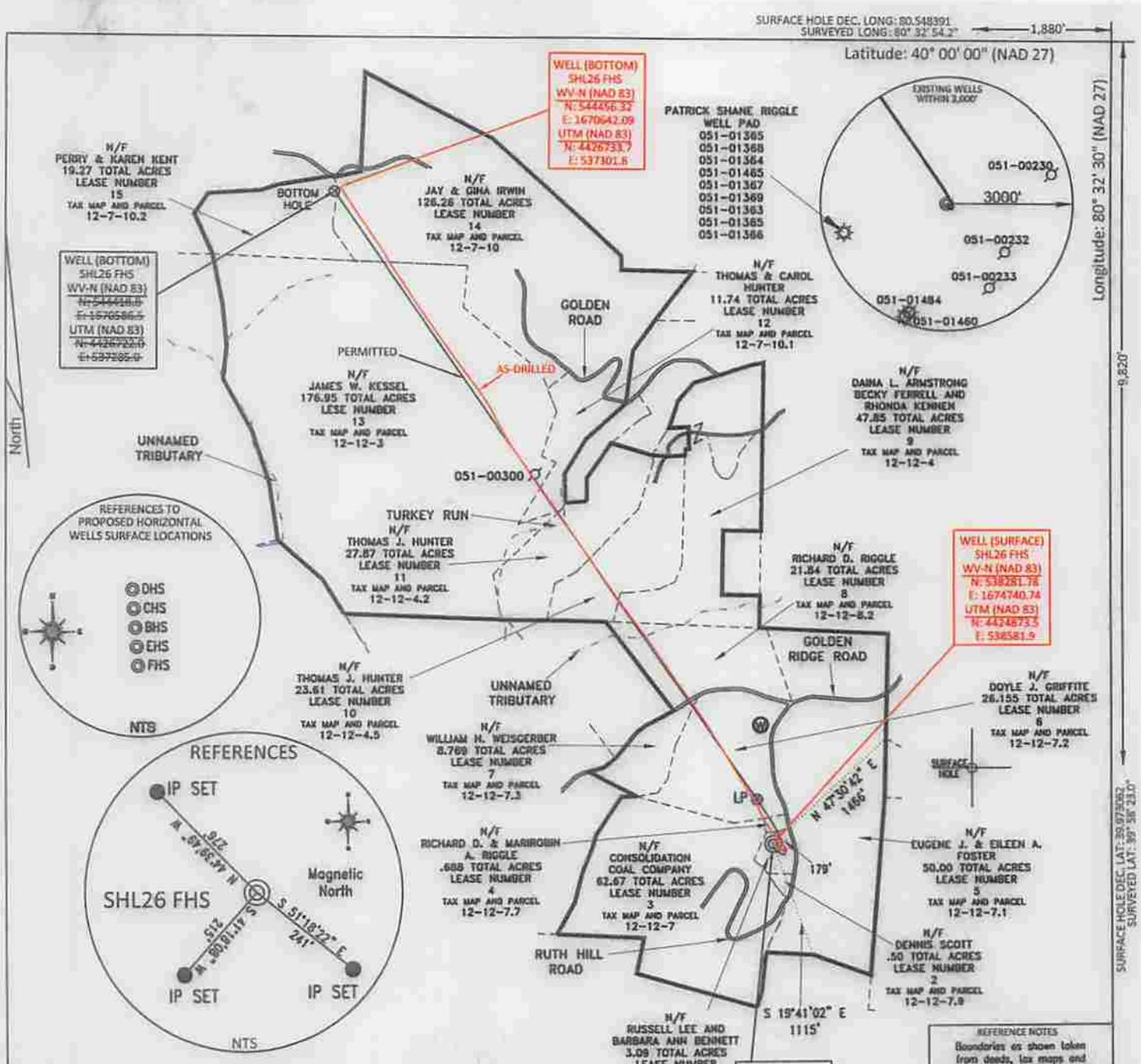
Critical Points

Critical Point	MD	INCL	AZIM	TVD	VSEC	NS (ft)	EW (ft)	DLS
SHL	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
First Survey 21 Nov 13	13867.00	91.27	329.51	6645.00	7366.00	5127.00	-4127.00	0.02
PTB	14040.00	91.27	329.51	6644.72	7511.00	5244.00	-4234.00	0.00





Vertical Section (ft) Azim = 325.908° Scale = 1:200(ft) Origin = 0N/-S, 0E/-W



SURFACE HOLE LOCATION	LANDING POINT LOCATION	BOTTOM HOLE LOCATION
UTM 17-NAD 83	UTM 17-NAD 83	UTM 17-NAD 83
~~N) 4424873.4~~	~~N) 4425000.2~~	~~N) 4426722.0~~
~~E) 538581.9~~	~~E) 538534.1~~	~~E) 537285.0~~
NAD 27, WV NORTH	NAD 27, WV NORTH	NAD 27, WV NORTH
~~N) 538244.53~~	~~N) 538663.19~~	~~N) 544381.86~~
~~E) 1706175.35~~	~~E) 1706025.23~~	~~E) 1702020.96~~

FILE #: NOB 002

DRAWING #: 2215

SCALE: PLAT - 1" = 1400' TICK MARK - 1" = 2000'

MINIMUM DEGREE OF ACCURACY: 1/200

PROVEN SOURCE OF ELEVATION: SUBMETER MAPPING GRADE GPS

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 DEPARTMENT OF ENVIRONMENTAL PROTECTION.

Signed: _____

L.L.S. #2124 : Ernest J. Benchek III

ERNEST J. BENCHEK III
LICENSED
No. 2124
STATE OF WEST VIRGINIA
PROFESSIONAL SURVEYOR

(+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS

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

DATE: AUGUST 8, 2014

OPERATOR'S WELL #: SHL26 FHS AS-DRILLED

API WELL #: 47 (STATE) 51 (COUNTY) 01657 (PERMIT)

Well Type: ☐ Oil ☐ Waste Diposal ☒ Production ☐ Deep
☒ Gas ☐ Liquid Injection ☐ Storage ☒ Shallow

WATERSHED: WHEELING CREEK

ELEVATION : 1,320'

COUNTY/DISTRICT: MARSHALL /SAND HILL

QUADRANGLE : MAJORSVILLE WV-PA

SURFACE OWNER: RUSSELL LEE AND BARBARA ANN BENNETT

ACREAGE: 3.09 +/-

OIL & GAS ROYALTY OWNER: JAMES O. WHIPKEY ET AL

ACREAGE: 345.844 +/-

LEASE NUMBERS: _____

DRILL ☒ CONVERT ☐ DRILL DEEPER ☐ REDRILL ☐ FRACTURE OR STIMULATE ☒
PLUG OFF FORMATION ☐ PERFORATE NEW FORMATION ☐ PLUG & ABANDON ☐
CLEAN OUT & REPLUG ☐ OTHER CHANGE ☐ (SPECIFY): _____

TARGET FORMATION: MARCELLUS

ESTIMATED DEPTH: TVD: 6,698' TMD: 14,034'

WELL OPERATOR : NOBLE ENERGY, INC.

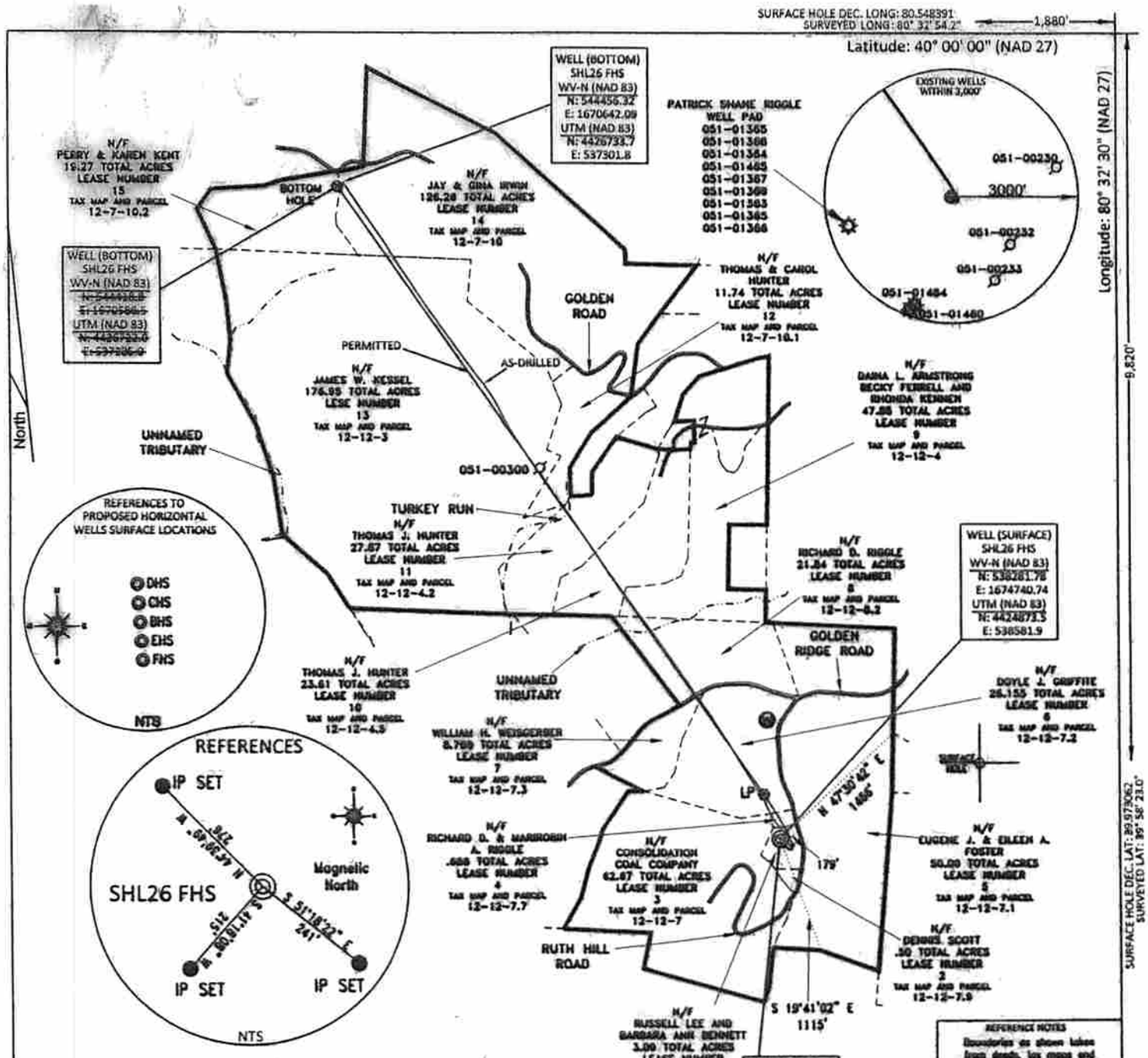
DESIGNATED AGENT : STEVEN M. GREEN

ADDRESS: 333 TECHNOLOGY DRIVE SUITE 116

ADDRESS: 500 VIRGINIA STREET EAST

CITY: CANONSBURG STATE: PA ZIP CODE: 15317

CITY: CHARLESTON STATE: WV ZIP CODE: 25301



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Signed: _____

L.L.S. #2124 : Ernest J. Benchek III

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DRILL ☒ CONVERT ☐ DRILL DEEPER ☐ REDRILL ☐ FRACTURE OR STIMULATE ☒
PLUG OFF FORMATION ☐ PERFORATE NEW FORMATION ☐ PLUG & ABANDON ☐
CLEAN OUT & REPLUG ☐ OTHER CHANGE ☐ (SPECIFY): _____

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CITY: CANONSBURG STATE: PA ZIP CODE: 15317

CITY: CHARLESTON STATE: WV ZIP CODE: 25301

pm

WR-35
Rev. 8/23/13

Page ___ of ___

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

API 47 - 051 - 01658 County Marshall District Sandhill
Quad Majorsville Pad Name SHL-26 Field/Pool Name
Farm name Russell Lee and Barbara Ann Bennett Well Number SHL26EHS
Operator (as registered with the OOG) Noble Energy Inc.
Address 333 Technology Drive, Suite 116 City Canonsburg State PA Zip 15317

As Drilled location NAD 83/UTM Attach an as-drilled plat, profile view, and deviation survey

Top hole	Northing	4424878.016973	Easting	538581.38962
Landing Point of Curve	Northing	4424914.371254	Easting	538372.570561
Bottom Hole	Northing	4426666.976651	Easting	537045.207804

Elevation (ft) 1308.39 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)
Synthetic Oil Based

Date permit issued 06/26/2013 Date drilling commenced 09/24/2013 Date drilling ceased 01/21/2014
Date completion activities began 04/23/2014 Date completion activities ceased 05/17/2014
Verbal plugging (Y/N) N Date permission granted _____ Granted by _____

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

Freshwater depth(s) ft 198', 300' Open mine(s) (Y/N) depths N
Salt water depth(s) ft N/A Void(s) encountered (Y/N) depths N
Coal depth(s) ft 761' to 771' Pittsburgh Cavern(s) encountered (Y/N) depths N
Is coal being mined in area (Y/N) Y

RECEIVED
Office of Oil and Gas
SEP 11 2014
WV Department of
Environmental Protection

Reviewed by: _____

WR-35
Rev. 8/23/13

API 47- 051 - 01658 Farm name Russell Lee and Barbara Ann Bennett Well number SHL26EHS

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	36	30	40	N	K-55 94#		
Surface	24	20	418	N	J-55 94#		Y
Coal	17 1/2	13 3/8	1236	N	J-55 54.5#		Y
Intermediate 1	12 3/8	9 5/8	3223	N	K-55 36#		Y
Intermediate 2							
Intermediate 3							
Production	8 3/4	5 1/2	13919	N	P-110 20#		Y
Tubing							
Packer type and depth set							

Comment Details 2 Baskets on Surface Casing

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	Type 1	487	15.6	1.19	106	0	8
Coal	Class A	1033	15.8	1.16	214	0	14
Intermediate 1	Class A	1170	16.2	1.09	227	0	20
Intermediate 2							
Intermediate 3							
Production	Class A	2302	14.8	1.25	512	3000	8
Tubing							

Drillers TD (ft) 13,930 Loggers TD (ft) 13848
Deepest formation penetrated Marcellus Plug back to (ft) not a pilot Hole
Plug back procedure not a pilot Hole

Kick off depth (ft) 6619

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
4 Centralizers on Surface casing. 10 Centralizers on Coal casing. 40 Centralizers on Intermediate casing. 253 Centralizers on Production casing.
On the Surface, Coal, and Intermediate Strings, the centralizers are on every 3 joint of casing.
On the Production String, they are on every 3rd from Surface to Top of Curve, then every joint until TD.

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

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Rev. 8/23/13

API 47- 051 - 01658 Farm name Russell Lee and Barbara Ann Bennett Well number SHL26EHS

PERFORATION RECORD

Stage No.	Perforation date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formation(s)

PLEASE SEE ATTACHED PERFORATION RECORD

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 (bbls)	Amount of Nitrogen/other (units)

PLEASE SEE ATTACHED STIMULATION INFORMATION PER STAGE SHEET

Please insert additional pages as applicable.

PERFORMATION RECORD

API: 47-051-01658 Farm name: Russell Lee and Barbara Ann Bennett Well Name: SHL-26E-HS

Stage No.	Stim Date	Top Perf	Bottom Perf	# of Perfs	Formation
TOE SLEEVE	3/7/2014	13801	13803		Marcellus
1	4/23/2014	13574	13791	48	Marcellus
2	5/2/2014	13273	13527	40	Marcellus
2B	5/2/2014	13304	13489	32	Marcellus
3	5/3/2014	12975	13227	48	Marcellus
6	5/4/2014	12075	12327	48	Marcellus
7	5/5/2014	11773	12027	40	Marcellus
8	5/5/2014	11473	11727	40	Marcellus
8B	5/6/2014	11463	11499	24	Marcellus
9	5/6/2014	11175	11427	48	Marcellus
10	5/6/2014	10875	11127	48	Marcellus
14	5/10/2014	9725	9927	48	Marcellus
15	5/10/2014	9425	9677	48	Marcellus
16	5/11/2014	9125	9377	48	Marcellus
16 REPERF	5/11/2014	9115	9154	24	Marcellus
17	5/12/2014	8825	9077	48	Marcellus
18	5/12/2014	8525	8777	48	Marcellus
19	5/12/2014	8225	8477	48	Marcellus
20	5/13/2014	7925	8177	48	Marcellus
21	5/14/2014	7625	7877	48	Marcellus
22	5/14/2014	7375	7577	48	Marcellus
23	5/15/2014	7125	7327	48	Marcellus

STIMULATION INFORMATION PER STAGE

API: 47-051-01658 Farm name: Russell Lee and Barbara Ann Bennett Well Name: SHL-26E-HS

Stage No.	Stim Date	Avg Rate (bpm)	ATP (psi)	Max BD Pressure	ISIP (psi)	Proppant (lbs)	Water (BBLS)	Amount of N^2/ other (units)
1	4/23/2014	89.4	8102	6553	9118	460788	9601.213	
2	5/2/2014	59.0	8464	5652	3878	1868	2683.09	
2B	5/2/2014	84.6	7550		3946	600641	12394.75	
3	5/3/2014	85.9	7886	5392	3855	599494	11561.48	
4	5/3/2014	77.2	7571	5421	5412	540913	12711.93	
5	5/4/2014	88.4	7457	5503	3922	620454	13715.64	
6	5/4/2014	88.2	7652	5638	4012	595234	11653.52	
7	5/5/2014	76.5	7619	5667	4135	599456	15917.99	
8	5/5/2014	47.0	8554	6068	5559	1633	5141.505	
8B	5/6/2014	78.4	7655		4089	604269	14252.76	
9	5/6/2014	88.3	7457	5337	4532	593509	12064.38	
10	5/6/2014	83.9	7779	5551	4593	600000	15145.71	
11	5/7/2014	87.0	7426	5389	4318	602154	11923.33	
12	5/7/2014	87.9	7704	5508	4420	602431	11609.43	
13	5/7/2014	50.6	8420	5493	5803	606423	5831.285	
13B	5/8/2014	71.4	7523		9411		10781.87	
14	5/10/2014	88.4	7543	5240	4379	500730	11786.7	
15	5/10/2014	85.1	6985	6213	4772	601826	11360.04	
16A	5/11/2014	64.7	8651	5980	4828	4610	4174.07	
16B	5/12/2014	80.0	7385		3920	604142	12975	
17	5/12/2014	87.8	7210	6575	4089	598934	13230.64	
18	5/12/2014	89.2	6629	5934	3746	595347	11436.06	
19	5/13/2014	89.1	6620	6110	4369	601472	11480.19	
20	5/13/2014	90.0	6726	6352	4406	601013	11346.98	
21	5/14/2014	88.3	6655	6590	4298	583406	12660.74	
22	5/14/2014	74.0	5945	5155	4670	500621	9304.587	
23	5/14/2014	71.3	6012	6698	3676	498453	8144.686	

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API 47- 051 - 01658 Farm name Russell Lee and Barbara Ann Bennett Well number SHL26EHS

PRODUCING FORMATION(S)	DEPTHS	
Marcellus	6627.4 TVD	13930 MD

Please insert additional pages as applicable.

GAS TEST ☐ Build up ☐ Drawdown ■ Open Flow OIL TEST ☐ Flow ☐ Pump

SHUT-IN PRESSURE Surface _____ psi Bottom Hole _____ psi DURATION OF TEST _____ hrs

OPEN FLOW	Gas	Oil	NGL	Water	GAS MEASURED BY
	2284 mcfpd	102 bpd	103 bpd	757 bpd	■ Estimated ☐ Orifice ☐ Pilot

LITHOLOGY/ FORMATION NAME	TOP DEPTH IN FT TVD	BOTTOM DEPTH IN FT TVD	TOP DEPTH IN FT MD	BOTTOM DEPTH IN FT MD	DESCRIBE ROCK TYPE AND RECORD QUANTITY AND TYPE OF FLUID (FRESHWATER, BRINE, OIL, GAS, H_2S, ETC)
	0		0		

PLEASE SEE FORMATION SHEET

Please insert additional pages as applicable.

Drilling Contractor Nabors Drilling USA, LP
Address 515 West Greens Rd, Suite 1000 City Houston State TX Zip 77067-4525

Logging Company Horizon Well Logging, LLC
Address 7136 S. Yale Ave. Suite 414 City Tulsa State OK Zip 74136

Cementing Company CalFrac
Address 717 17th St., Suite 1445 City Denver State CO Zip 80202

Stimulating Company Halliburton Energy Services
Address 121 Champion Way, Suite 210 City Canonsburg State PA Zip 15317

Please insert additional pages as applicable.

Completed by Dee Swiger Telephone 724-820-3061
Signature _____ Title _____ Date _____

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

FORMATIONS

API 47-051-5101658 Farm Name Russell Lee and Barbara Ann Bennett Well Name SHL26E

Lithology/Formation	Top Depth In FT TVD	Bottom Depth In FT TVD	Top Depth In Ft MD	Bottom Depth In FT MD	Describe Rock Type and Record Quantity and Type of Fluid (Freshwater, Brine, Oil, Gas, H2S, ETC)
Shale	0	808	0	808	
Pittsburgh Coal	808	817	808	817	
Shale and Sandstone	817	1264	817	1264	
Dunkard Sand	1264	1275	1264	1275	
Shale	1275	1446	1275	1446	
Gas Sand	1446	1485	1446	1485	
Shale	1485	1577	1485	1578	
1st Salt Sand	1577	1601	1578	1602	
Shale	1601	1610	1602	1611	
2nd Salt Sand	1610	1655	1611	1656	
Shale	1655	1738	1656	1739	
Maxton Sand	1738	1750	1739	1751	
Shale	1750	1793	1751	1795	
Big Lime	1793	1873	1795	1875	
Big Injun	1873	2067	1875	2069	
Price	2067	2425	2069	2428	
Murrysville	2425	2439	2428	2442	
Shale	2439	2636	2442	2639	
50' Sand	2636	2638	2639	2641	
Shale	2638	2691	2641	2694	
30' Sand	2691	2700	2694	2703	
Shale	2700	2742	2703	2745	
Gordon Stray	2742	2757	2745	2760	
Shale	2757	2793	2760	2796	
Gordon	2793	2806	2796	2809	
Shale	2806	2902	2809	2905	
Fifth Sand	2902	2936	2905	2939	
Shale	2936	3342	2939	3345	
Speechley Sand	3342	3370	3345	3373	
Shale	3370	4378	3373	4381	
Warren Sand	4378	4387	4381	4390	
Shale	4387	5045	4390	5048	
Java Shale	5045	5216	5048	5219	
Pipe Creek Shale	5216	5273	5219	5276	
Angola Shale	5273	5898	5276	5932	
Rhinestreet	5898	6314	5932	6488	
Cashaqua	6314	6405	6488	6608	
Middlesex	6405	6440	6608	6656	
West River	6440	6492	6656	6733	
Burkett	6492	6515	6733	6770	
Tully Limestone	6515	6545	6770	6820	
Hamilton	6545	6656	6820	7123	
Marcellus	6656	6706	7123	not encountered	Gas

Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date:	4/23/2014
Job End Date:	5/14/2014
State:	West Virginia
County:	Marshall
API Number:	47-051-01658-00-00
Operator Name:	Noble Energy, Inc.
Well Name and Number:	SHL26 E
Longitude:	-80.54839700
Latitude:	39.97310300
Datum:	NAD27
Federal/Tribal Well:	NO
True Vertical Depth:	6,627
Total Base Water Volume (gal):	12,385,362
Total Base Non Water Volume:	0

FracFocus Chemical Disclosure Registry

GROUNDWATER PROTECTION COUNCIL

Oil & Gas

51-01658

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
Fresh Water	Operator	Base Fluid					
			Fresh Water	7732-18-5	100.00000	87.86294	Density = 8.340
SAND - PREMIUM WHITE	Halliburton	Proppant					
			Crystalline silica, quartz	14808-60-7	100.00000	9.05769	
SAND - COMMON WHITE	Halliburton	Proppant					
			Crystalline silica, quartz	14808-60-7	100.00000	2.30468	
HYDROCHLORIC ACID 5-10%	Halliburton	Solvent					
			Hydrochloric acid	7647-01-0	10.00000	0.06295	
FR-66	Halliburton	Friction Reducer					
			Hydrotreated light petroleum distillate	64742-47-8	30.00000	0.01210	
LGC-36 UC	Halliburton	Liquid Gel Concentrate					
			Naphtha, hydrotreated heavy	64742-48-9	60.00000	0.00472	
			Guar gum	9000-30-0	60.00000	0.00472	
PermVis VFR-10	Halliburton	Friction Reducer					
			Hydrotreated light petroleum distillate	64742-47-8	30.00000	0.00443	
			Alcohols, C12-16, ethoxylated	68551-12-2	10.00000	0.00148	
			Ammonium chloride	12125-02-9	10.00000	0.00148	

			9-Octadecenamide, n,n-bis-2 (hydroxy-ethyl)-,(Z)	93-83-4	5.00000	0.00074	
FE-1A ACIDIZING COMPOSITION	Halliburton	Additive					
			Acetic anhydride	108-24-7	100.00000	0.00336	
			Acetic acid	64-19-7	60.00000	0.00203	
BE-9	Halliburton	Biocide					
			Tributyl tetradecyl phosphonium chloride	81741-28-8	10.00000	0.00392	
HYDROCHLORIC ACID 10-30%	Halliburton	Solvent					
			Hydrochloric acid	7647-01-0	30.00000	0.00343	
LCA-1	Halliburton	Solvent					
			Paraffinic solvent	Confidential	100.00000	0.00242	Denise Tuck, Halliburton 3000 N. Sam Houston Pkwy E., Houston, TX 77032 281-871-6226
LP-65	Halliburton	Scale Inhibitor					
			Ammonium chloride	12125-02-9	10.00000	0.00239	
LOSURF-300 NONIONIC SURFACTANT	Halliburton	Surfactant					
			Isopropanol	67-63-0	60.00000	0.00069	
			Light aromatic solvent	64742-95-6	30.00000	0.00034	
			Ethoxylated nonylphenol	Confidential	10.00000	0.00012	
HAI-OS ACID INHIBITOR	Halliburton	Corrosion Inhibitor					
			Methanol	67-56-1	60.00000	0.00034	
			Propargyl alcohol	107-19-7	10.00000	0.00006	
SP BREAKER	Halliburton	Breaker					
			Sodium persulfate	7775-27-1	100.00000	0.00016	
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 Ingredient(s)					
			Water	7732-18-5		0.72313	
		Other Ingredient(s)					
			Organic phosphonate	Confidential		0.01434	
		Other Ingredient(s)					
			Polyacrylamide copolymer	Confidential		0.01210	
		Other Ingredient(s)					
			Polyacrylate	Confidential		0.00443	
		Other Ingredient(s)					
			Inorganic salt	Confidential		0.00443	
		Other Ingredient(s)					
			Ammonium chloride	12125-02-9		0.00202	
		Other Ingredient(s)					
			Alcohols, C12-16, ethoxylated	68551-12-2		0.00202	
		Other Ingredient(s)					

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			Sodium chloride	7647-14-5		0.00202	
		Other Ingredient(s)					
			Fatty acid tall oil amide	Confidential		0.00202	
		Other Ingredient(s)					
			Fatty acid ester	Confidential		0.00074	
		Other Ingredient(s)					
			Formaldehyde polymer with methyl oxirane, 4-nonylphenol and oxirane	53428-92-2		0.00069	
		Other Ingredient(s)					
			Sorbitan monooleate polyoxyethylene derivative	9005-65-6		0.00040	
		Other Ingredient(s)					
			Sorbitan, mono-9-octadecenoate, (Z)	1338-43-8		0.00040	
		Other Ingredient(s)					
			Quaternary ammonium compounds, bis(hydrogenated tallow alkyl) dimethyl,salts with bentonite	68953-58-2		0.00039	
		Other Ingredient(s)					
			Formaldehyde polymer with 4,1,1-dimethylethyl phenolmethyl oxirane	29316-47-0		0.00034	
		Other Ingredient(s)					
			Formaldehyde	50-00-0		0.00024	
		Other Ingredient(s)					
			Alcohols, C14-C15, ethoxylated	68951-67-7		0.00017	
		Other Ingredient(s)					
			Fatty acids, tall oil	Confidential		0.00017	
		Other Ingredient(s)					
			Reaction product of acetophenone, formaldehyde, thiourea and oleic acid in dimethyl formamide	68527-49-1		0.00017	
		Other Ingredient(s)					
			Fatty alcohol polyglycol ether surfactant	9043-30-5		0.00008	
		Other Ingredient(s)					
			Naphthalene	91-20-3		0.00006	
		Other Ingredient(s)					
			Olefins	Confidential		0.00003	
		Other Ingredient(s)					
			Olefins	Confidential		0.00003	
		Other Ingredient(s)					
			Crystalline silica, quartz	14808-60-7		0.00001	
		Other Ingredient(s)					
			Olefins	Confidential		0.00001	
		Other Ingredient(s)					
			Olefins	Confidential		0.00001	

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		Other Ingredient(s)					
			Sodium sulfate	7757-82-6		0.00000	

* 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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PATHFINDER

noble energy

Noble Energy SHL-26E-HS Gyro+MWD 0ft to update Survey Report

(Non-Def Survey)

Report Date:	January 21, 2014 - 11:48 AM
Client:	Noble Energy
Field:	WV Marshall County (NAD 27)
Structure / Slot:	Noble Energy SHL-26 Pad / SHL-26E-HS
Well:	SHL-26E-HS
Borehole:	Original Borehole
UWI / API#:	Unknown / Unknown
Survey Name:	Noble Energy SHL-26E-HS Gyro+MWD 0ft to update
Survey Date:	January 14, 2014
Tort / AHD / DDI / ERD Ratio:	200.826 ° / 7978.797 ft / 6.524 / 1.196
Coordinate Reference System:	NAD27 West Virginia State Plane, Northern Zone, US Feet
Location Lat / Long:	N 39° 58' 23.17071", W 80° 32' 54.22751"
Location Grid N/E Y/X:	N 538259.654 ftUS, E 1706173.846 ftUS
CRS Grid Convergence Angle:	-0.6686 °
Grid Scale Factor:	0.9999596
Version / Patch:	2.7.1043.0

Survey / DLS Computation:	Minimum Curvature / Lubinski
Vertical Section Azimuth:	320.254 ° (Grid North)
Vertical Section Origin:	0.000 ft, 0.000 ft
TVD Reference Datum:	KB
TVD Reference Elevation:	1331.970 ft above MSL
Seabed / Ground Elevation:	1309.180 ft above MSL
Magnetic Declination:	-8.417 °
Total Gravity Field Strength:	999.3453mgn (9.80665 Based)
Gravity Model:	GARM
Total Magnetic Field Strength:	53115.365 nT
Magnetic Dip Angle:	67.502 °
Declination Date:	January 14, 2014
Magnetic Declination Model:	HDGM 2013
North Reference:	Grid North
Grid Convergence Used:	-0.6686 °
Total Corr Mag North->Grid North:	-7.7483 °
Local Coord Referenced To:	Well Head

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Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	TVDSS (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	BR (°/100ft)	TR (°/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ' ")	Longitude (E/W ° ' ")	Directional Difficulty Index
SHL	0.00	0.00	0.00	0.00	-1331.97	0.00	0.00	0.00	N/A	N/A	N/A	538259.65	1706173.85	N 39 58 23.17	W 80 32 54.23	0.00
	110.30	1.39	117.92	110.29	-1221.68	-1.24	-0.63	1.16	1.26	1.26	0.00	538259.03	1706175.03	N 39 58 23.16	W 80 32 54.21	0.27
	210.30	1.44	124.37	210.26	-1121.71	-3.57	-1.90	3.29	0.17	0.05	6.45	538257.75	1706177.14	N 39 58 23.15	W 80 32 54.18	0.77
	310.30	1.18	124.61	310.23	-1021.74	-5.77	-3.20	5.18	0.26	-0.26	0.24	538256.40	1706179.02	N 39 58 23.14	W 80 32 54.16	1.04
	410.30	1.68	119.55	410.21	-921.76	-7.64	-4.25	6.84	0.14	-0.10	-5.06	538255.41	1706180.69	N 39 58 23.13	W 80 32 54.14	1.20
	510.30	0.67	123.68	510.20	-821.77	-9.08	-5.04	8.15	0.41	-0.41	4.13	538254.62	1706181.99	N 39 58 23.12	W 80 32 54.12	1.36
	610.30	0.51	142.85	610.20	-721.77	-10.09	-5.72	8.90	0.25	-0.16	19.17	538253.94	1706182.75	N 39 58 23.12	W 80 32 54.11	1.44
	709.30	0.34	298.68	709.19	-622.78	-10.26	-5.93	8.91	0.84	-0.17	157.40	538253.73	1706182.76	N 39 58 23.11	W 80 32 54.11	1.58
	744.00	0.25	229.90	743.89	-588.08	-10.16	-5.93	8.76	0.98	-0.26	-198.21	538253.73	1706182.61	N 39 58 23.11	W 80 32 54.11	1.63
	794.00	0.34	71.87	793.89	-538.08	-10.22	-5.95	8.82	1.16	0.18	-316.06	538253.71	1706182.67	N 39 58 23.11	W 80 32 54.11	1.70
	855.00	0.48	350.86	854.89	-477.08	-10.06	-5.64	8.95	0.89	0.23	-132.80	538254.01	1706182.80	N 39 58 23.12	W 80 32 54.11	1.76
	916.00	0.67	342.69	915.89	-416.08	-9.41	-4.95	8.78	0.66	0.64	-13.39	538254.71	1706182.62	N 39 58 23.12	W 80 32 54.11	1.82
	977.00	1.25	331.92	976.88	-355.09	-8.33	-3.92	8.32	0.70	0.62	-17.66	538255.74	1706182.17	N 39 58 23.13	W 80 32 54.12	1.89
	1039.00	1.17	343.52	1038.86	-293.11	-7.09	-2.71	7.83	0.41	-0.13	18.71	538256.94	1706181.67	N 39 58 23.14	W 80 32 54.13	1.95
	1101.00	1.16	339.85	1100.85	-231.12	-5.91	-1.51	7.43	0.12	0.02	-5.92	538258.15	1706181.27	N 39 58 23.16	W 80 32 54.13	1.99
	1162.00	0.95	335.08	1161.84	-170.13	-4.83	-0.46	7.00	0.40	-0.38	-7.85	538259.20	1706180.84	N 39 58 23.17	W 80 32 54.14	2.04
	1188.00	0.96	320.69	1187.84	-144.13	-4.40	-0.09	6.77	0.92	0.04	-55.27	538259.56	1706180.61	N 39 58 23.17	W 80 32 54.14	2.08
	1320.00	0.91	342.18	1319.82	-12.15	-2.32	1.76	5.75	0.27	-0.04	16.28	538261.41	1706179.59	N 39 58 23.19	W 80 32 54.15	2.14
	1368.00	1.39	325.13	1367.81	35.84	-1.39	2.60	5.30	1.22	1.00	-35.52	538262.25	1706179.14	N 39 58 23.20	W 80 32 54.16	2.19
	1415.00	2.22	307.06	1414.79	82.82	0.07	3.62	4.25	2.12	1.77	-38.45	538263.27	1706178.09	N 39 58 23.21	W 80 32 54.17	2.28
	1462.00	2.91	299.88	1461.74	129.77	2.07	4.76	2.48	1.62	1.47	-15.28	538264.41	1706176.33	N 39 58 23.22	W 80 32 54.20	2.35
	1509.00	3.70	291.35	1508.68	176.69	4.52	5.90	0.04	1.98	1.68	-18.15	538265.56	1706173.88	N 39 58 23.23	W 80 32 54.23	2.44
	1557.00	4.64	281.94	1556.53	224.56	7.40	6.87	-3.30	2.42	1.96	-19.60	538266.52	1706170.64	N 39 58 23.24	W 80 32 54.27	2.54
	1604.00	5.48	279.01	1603.35	271.38	10.57	7.62	-7.38	1.87	1.79	-6.23	538267.27	1706166.47	N 39 58 23.25	W 80 32 54.32	2.63
	1651.00	5.62	280.25	1650.13	318.16	14.02	8.38	-11.86	0.30	0.30	2.64	538268.03	1706161.98	N 39 58 23.25	W 80 32 54.38	2.69
	1698.00	5.89	280.07	1696.89	364.92	17.63	9.21	-16.50	0.58	0.57	-0.38	538268.86	1706157.35	N 39 58 23.26	W 80 32 54.44	2.75
	1746.00	6.11	280.65	1744.63	412.66	21.48	10.11	-21.44	0.46	0.46	1.21	538269.76	1706152.41	N 39 58 23.27	W 80 32 54.50	2.80
	1841.00	4.29	272.17	1839.24	507.27	27.75	11.18	-29.96	2.07	-1.92	-8.93	538270.83	1706143.89	N 39 58 23.28	W 80 32 54.61	2.93
	1935.00	4.05	268.04	1932.99	601.02	32.13	11.20	-36.79	0.41	-0.26	-4.39	538270.85	1706137.06	N 39 58 23.28	W 80 32 54.70	2.99
	2030.00	3.73	264.42	2027.77	695.80	35.92	10.78	-43.22	0.42	-0.34	-3.81	538270.44	1706130.63	N 39 58 23.27	W 80 32 54.78	3.05
	2125.00	2.78	265.70	2122.82	790.65	38.99	10.31	-48.59	1.00	-1.00	1.35	538269.96	1706125.26	N 39 58 23.27	W 80 32 54.85	3.10
	2219.00	1.91	266.15	2216.54	884.57	41.24	10.03	-52.43	0.93	-0.93	0.48	538269.69	1706121.42	N 39 58 23.26	W 80 32 54.90	3.15
	2314.00	1.15	247.71	2311.50	979.53	42.45	9.57	-54.89	0.94	-0.80	-19.41	538269.22	1706118.96	N 39 58 23.26	W 80 32 54.93	3.18
	2408.00	1.27	248.83	2405.48	1073.51	43.06	8.83	-56.73	0.13	0.13	1.19	538268.49	1706117.12	N 39 58 23.25	W 80 32 54.96	3.19
	2503.00	0.90	251.43	2500.46	1168.49	43.67	8.21	-58.42	0.39	-0.39	2.74	538267.87	1706115.43	N 39 58 23.25	W 80 32 54.98	3.21
	2598.00	0.74	253.10	2595.45	1263.48	44.18	7.80	-59.71	0.17	-0.17	1.82	538267.45	1706114.13	N 39 58 23.24	W 80 32 55.00	3.22
	2692.00	0.68	259.18	2689.45	1357.48	44.68	7.52	-60.84	0.10	-0.06	6.40	538267.17	1706113.01	N 39 58 23.24	W 80 32 55.01	3.23
	2787.00	0.89	250.35	2784.44	1452.47	45.21	7.18	-62.09	0.25	0.22	-9.29	538266.82	1706111.76	N 39 58 23.23	W 80 32 55.03	3.24
	2882.00	1.06	257.11	2879.42	1547.45	45.86	6.72	-63.64	0.22	0.18	7.12	538266.37	1706110.21	N 39 58 23.23	W 80 32 55.05	3.26

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	TVDSS (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	BR (°/100ft)	TR (°/100ft)	Northing (RUS)	Easting (RUS)	Latitude (N/S ° ' ")	Longitude (E/W ° ' ")	Directional Difficulty Index
	2978.00	1.32	257.05	2973.40	1641.43	46.74	6.28	-65.55	0.28	0.28	-0.06	538265.94	1706108.30	N 39 58 23.23	W 80 32 55.07	3.27
	3071.00	1.53	262.88	3068.37	1736.40	47.92	5.88	-67.87	0.27	0.22	6.14	538265.54	1706105.98	N 39 58 23.22	W 80 32 55.10	3.29
	3166.00	1.82	258.88	3163.33	1831.36	49.32	5.43	-70.61	0.33	0.31	-4.21	538265.09	1706103.24	N 39 58 23.22	W 80 32 55.14	3.31
	3180.00	1.90	259.20	3177.33	1845.36	49.54	5.35	-71.06	0.58	0.57	2.29	538265.00	1706102.79	N 39 58 23.22	W 80 32 55.14	3.31
	3297.00	1.95	259.48	3294.26	1962.29	51.45	4.82	-74.92	0.04	0.04	0.24	538264.27	1706098.93	N 39 58 23.21	W 80 32 55.19	3.33
	3391.00	0.34	262.12	3388.24	2056.27	52.38	4.29	-76.77	1.71	-1.71	2.81	538263.94	1706097.08	N 39 58 23.20	W 80 32 55.21	3.37
	3485.00	0.60	30.10	3482.24	2150.27	52.70	4.68	-76.80	0.91	0.28	138.15	538264.33	1706097.05	N 39 58 23.21	W 80 32 55.21	3.39
	3580.00	0.81	23.66	3577.23	2245.26	53.17	5.72	-76.29	0.24	0.22	-6.78	538265.38	1706097.57	N 39 58 23.22	W 80 32 55.21	3.40
	3675.00	0.72	12.33	3672.22	2340.25	53.84	6.92	-75.68	0.18	-0.09	-11.93	538266.57	1706097.97	N 39 58 23.23	W 80 32 55.20	3.40
	3769.00	0.47	2.72	3766.22	2434.25	54.49	7.88	-75.74	0.29	-0.27	-10.22	538267.54	1706098.11	N 39 58 23.24	W 80 32 55.20	3.41
	3863.00	0.39	336.17	3860.21	2528.24	55.08	8.56	-75.85	0.23	-0.09	-28.24	538268.21	1706098.00	N 39 58 23.25	W 80 32 55.20	3.42
	3958.00	0.41	338.13	3955.21	2623.24	55.71	9.17	-76.10	0.03	0.02	2.06	538268.83	1706097.74	N 39 58 23.25	W 80 32 55.21	3.42
	4053.00	0.44	343.56	4050.21	2718.24	56.37	9.84	-76.33	0.05	0.03	5.72	538269.49	1706097.52	N 39 58 23.26	W 80 32 55.21	3.43
	4147.00	0.49	329.13	4144.21	2812.24	57.10	10.53	-76.64	0.13	0.05	-15.35	538270.18	1706097.21	N 39 58 23.27	W 80 32 55.21	3.43
	4242.00	0.27	316.12	4239.20	2907.23	57.72	11.04	-77.01	0.25	-0.23	-13.69	538270.69	1706096.84	N 39 58 23.27	W 80 32 55.22	3.44
	4337.00	0.20	303.90	4334.20	3002.23	58.11	11.29	-77.30	0.09	-0.07	-12.86	538270.95	1706096.55	N 39 58 23.27	W 80 32 55.22	3.44
	4431.00	0.27	307.28	4428.20	3096.23	58.48	11.52	-77.61	0.08	0.07	3.60	538271.17	1706096.24	N 39 58 23.28	W 80 32 55.23	3.44
	4526.00	0.31	306.92	4523.20	3191.23	58.95	11.81	-77.99	0.04	0.04	-0.38	538271.46	1706095.85	N 39 58 23.28	W 80 32 55.23	3.45
	4620.00	0.29	292.02	4617.20	3285.23	59.40	12.05	-78.42	0.09	-0.02	-15.85	538271.70	1706095.43	N 39 58 23.28	W 80 32 55.24	3.45
	4715.00	0.31	297.50	4712.20	3380.23	59.85	12.26	-78.87	0.04	0.02	5.77	538271.91	1706094.98	N 39 58 23.28	W 80 32 55.24	3.45
	4810.00	0.39	265.37	4807.20	3475.23	60.28	12.35	-79.42	0.22	0.08	-33.82	538272.00	1706094.43	N 39 58 23.28	W 80 32 55.25	3.46
	4904.00	0.14	235.88	4901.20	3569.23	60.47	12.26	-79.83	0.29	-0.27	-31.59	538271.91	1706094.02	N 39 58 23.28	W 80 32 55.25	3.46
	4999.00	0.11	246.09	4996.19	3664.22	60.51	12.16	-80.01	0.04	-0.03	10.98	538271.81	1706093.84	N 39 58 23.28	W 80 32 55.26	3.47
	5093.00	0.22	214.57	5090.19	3758.22	60.48	11.97	-80.20	0.15	0.12	-33.53	538271.63	1706093.65	N 39 58 23.28	W 80 32 55.26	3.47
	5188.00	0.27	224.51	5185.19	3853.22	60.41	11.66	-80.46	0.07	0.05	10.46	538271.32	1706093.39	N 39 58 23.28	W 80 32 55.26	3.47
	5235.00	0.24	250.04	5232.19	3900.22	60.43	11.55	-80.63	0.25	-0.06	55.60	538271.21	1706093.22	N 39 58 23.28	W 80 32 55.26	3.47
	5283.00	1.21	263.68	5280.19	3948.22	60.75	11.46	-81.23	2.04	2.02	27.58	538271.12	1706092.62	N 39 58 23.27	W 80 32 55.27	3.49
	5330.00	3.73	265.19	5327.14	3995.17	61.90	11.28	-83.24	5.36	5.36	2.79	538270.94	1706090.61	N 39 58 23.27	W 80 32 55.30	3.54
	5378.00	5.82	276.23	5374.97	4043.00	64.55	11.42	-87.22	4.74	4.35	23.00	538271.07	1706086.63	N 39 58 23.27	W 80 32 55.35	3.59
	5425.00	7.78	287.27	5421.64	4089.67	68.93	12.62	-92.63	4.99	4.17	23.49	538272.27	1706081.22	N 39 58 23.28	W 80 32 55.42	3.64
	5472.00	9.37	289.68	5468.12	4136.15	74.89	14.85	-99.27	3.47	3.38	5.13	538274.51	1706074.58	N 39 58 23.31	W 80 32 55.50	3.68
	5519.00	10.86	285.14	5514.38	4182.41	81.81	17.30	-107.15	3.50	3.17	-9.66	538276.95	1706066.71	N 39 58 23.33	W 80 32 55.61	3.73
	5567.00	12.47	280.26	5561.39	4229.42	89.48	19.40	-116.61	3.93	3.35	-10.17	538279.06	1706057.24	N 39 58 23.35	W 80 32 55.73	3.78
	5614.00	14.21	276.32	5607.12	4275.15	97.52	20.94	-127.34	4.17	3.70	-8.38	538280.59	1706048.51	N 39 58 23.36	W 80 32 55.87	3.83
	5662.00	15.79	274.64	5653.49	4321.52	106.33	22.12	-139.70	3.41	3.29	-3.50	538281.77	1706034.15	N 39 58 23.37	W 80 32 56.03	3.88
	5705.00	17.25	272.70	5694.71	4362.74	114.73	22.89	-151.90	3.63	3.40	-4.51	538282.54	1706021.95	N 39 58 23.38	W 80 32 56.18	3.92
	5753.00	20.83	274.26	5740.08	4408.11	125.46	23.86	-167.53	7.53	7.46	3.25	538283.51	1706006.32	N 39 58 23.39	W 80 32 56.38	3.99
	5800.00	25.08	277.60	5783.25	4451.28	138.79	25.87	-185.96	10.73	10.32	7.53	538285.52	1705987.89	N 39 58 23.40	W 80 32 56.62	4.07
	5847.00	28.81	280.03	5825.03	4493.08	154.96	29.22	-207.21	7.00	6.60	4.74	538288.87	1705966.64	N 39 58 23.44	W 80 32 56.89	4.14
	5894.00	31.07	280.98	5865.76	4533.79	172.99	33.50	-230.27	4.91	4.81	2.02	538293.16	1705943.58	N 39 58 23.48	W 80 32 57.19	4.20
	5942.00	34.34	281.91	5906.14	4574.17	193.21	38.68	-255.69	6.89	6.81	1.94	538298.31	1705918.17	N 39 58 23.52	W 80 32 57.52	4.26
	5989.00	39.14	281.42	5943.79	4611.82	215.17	44.33	-283.21	10.23	10.21	-1.04	538303.99	1705890.65	N 39 58 23.58	W 80 32 57.87	4.33
	6036.00	44.16	280.90	5978.90	4646.93	239.40	50.37	-313.85	10.71	10.68	-1.11	538310.02	1705860.01	N 39 58 23.63	W 80 32 58.27	4.41
	6083.00	44.71	280.19	6012.48	4680.49	264.71	56.39	-346.20	1.56	1.17	-1.51	538316.04	1705827.68	N 39 58 23.69	W 80 32 58.68	4.45
	6131.00	44.37	281.70	6046.68	4714.71	290.76	62.78	-379.25	2.32	-0.71	3.15	538322.43	1705794.61	N 39 58 23.75	W 80 32 59.11	4.49
	6178.00	44.38	280.40	6080.27	4748.30	316.23	69.08	-411.51	1.93	0.02	-2.77	538328.73	1705762.35	N 39 58 23.81	W 80 32 59.52	4.53
	6226.00	43.09	280.41	6114.95	4782.98	341.70	75.07	-444.15	2.69	-2.69	0.02	538334.73	1705729.72	N 39 58 23.86	W 80 32 59.94	4.57
	6273.00	41.47	284.24	6149.73	4817.76	366.62	81.81	-475.03	6.47	-3.45	8.15	538341.46	1705698.84	N 39 58 23.92	W 80 33 0.34	4.62
	6320.00	40.36	288.42	6185.25	4853.28	392.15	90.44	-504.56	6.28	-2.36	8.89	538350.09	1705669.31	N 39 58 24.01	W 80 33 0.72	4.66
	6367.00	39.94	287.16	6221.18	4889.21	417.72	99.70	-533.41	1.95	-0.89	-2.68	538359.35	1705640.46	N 39 58 24.09	W 80 33 1.09	4.69
	6415.00	40.03	282.17	6257.97	4926.00	442.78	107.51	-563.23	6.68	0.19	-10.40	538367.16	1705610.64	N 39 58 24.17	W 80 33 1.46	4.73
	6462.00	39.92	279.88	6293.99	4962.02	468.17	113.28	-592.66	3.14	-0.23	-4.87	538372.93	1705581.01	N 39 58 24.22	W 80 33 1.86	4.76
	6509.00	39.96	279.79	6330.02	4998.05	489.14	118.43	-622.59	0.15	0.09	-0.19	538378.08	1705551.28	N 39 58 24.27	W 80 33 2.24	4.78
	6556.00	40.70	281.71	6365.85	5033.88	512.61	124.11	-652.47	3.08	1.57	4.09	538383.76	1705521.40	N 39 58 24.32	W 80 33 2.63	4.81
	6604.00	41.31	282.73	6402.08	5070.11	537.42	130.78	-683.25	1.69	1.27	2.13	538390.43	1705490.62	N 39 58 24.38	W 80 33 3.02	4.83
	6651.00	44.47	289.96	6436.53	5104.56	563.96	139.63	-713.69	12.43	6.72	15.38	538399.47	1705459.99	N 39 58 24.47	W 80 33 3.42	4.88
	6699.00	48.03	294.60	6469.72	5137.75	594.58	153.00	-745.93	10.18	7.42	9.67	538412.65	1705427.95	N 39 58 24.60	W 80 33 3.83	4.92
	6746.00	50.50	298.33	6500.40	5168.43	627.16	168.68	-777.79	7.68	5.26	7.94	538428.53	1705396.09	N 39 58 24.75	W 80 33 4.24	4.95
	6793.00	53.26	300.16	6529.41	5197.44	661.68	186.98	-810.04	6.62	5.87	3.89	538446.60	1705363.84	N 39 58 24.92	W 80 33 4.66	4.99
	6840.00	57.55	303.49	6556.10	5224.13	698.37	207.37	-842.89	10.83	9.13	7.09	538467.02	1705331.00	N 39 58 25.12	W 80 33 5.08	5.03
	6888.00	62.21	306.68	6580.18	5248.21	738.44	231.25	-876.83	11.26	9.71	6.65	538490.89	1705297.06	N 39 58 25.35	W 80 33 5.52	5.07
	6935.00	66.47	310.30	6600.53	5268.56	779.90	257.62	-909.96	11.42	9.06	7.70	538517.27	1705263.93	N 39 58 25.61	W 80 33 5.95	5.11

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Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	TVDSS (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	BR (°/100ft)	TR (°/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ' ")	Longitude (E/W ° ' ")	Directional Difficulty Index
	6982.00	89.56	311.90	6618.13	5286.16	822.92	286.27	-942.79	7.29	6.57	3.40	538545.91	1705231.10	N 39 58 25.89	W 80 33 8.38	5.14
	7029.00	72.42	314.45	6633.44	5301.47	867.01	316.68	-875.18	7.96	6.09	5.43	538576.32	1705188.70	N 39 58 26.19	W 80 33 6.80	5.17
	7077.00	76.85	316.53	6646.24	5314.27	913.10	349.68	-1007.60	9.75	8.81	4.33	538609.30	1705166.29	N 39 58 26.51	W 80 33 7.22	5.21
	7124.00	78.91	319.91	6650.10	5324.22	958.99	383.91	-1038.19	8.52	4.81	7.19	538643.55	1705135.70	N 39 58 26.84	W 80 33 7.62	5.24
	7171.00	80.89	321.49	6664.43	5332.46	1005.26	419.72	-1067.50	5.36	4.21	3.36	538679.36	1705106.39	N 39 58 27.19	W 80 33 8.00	5.27
	7218.00	85.16	323.23	6670.13	5338.16	1051.67	456.65	-1095.98	9.84	9.13	3.70	538716.29	1705077.91	N 39 58 27.56	W 80 33 8.37	5.30
	7266.00	89.07	325.52	6672.53	5340.56	1099.67	495.61	-1123.89	9.40	8.10	4.77	538755.25	1705050.00	N 39 58 27.94	W 80 33 8.74	5.33
	7297.00	90.17	326.30	6672.74	5340.77	1130.52	521.28	-1141.27	4.35	3.55	2.52	538780.92	1705032.63	N 39 58 28.19	W 80 33 8.96	5.35
	7360.00	90.65	326.02	6672.29	5340.32	1193.18	573.61	-1176.35	0.68	0.76	-0.44	538833.24	1704997.55	N 39 58 28.70	W 80 33 9.42	5.37
	7455.00	90.38	324.65	6671.43	5339.40	1287.60	651.74	-1230.38	1.47	-0.28	-1.44	538911.37	1704943.52	N 39 58 29.47	W 80 33 10.13	5.41
	7549.00	89.72	325.27	6671.35	5339.38	1381.49	728.70	-1284.35	0.96	-0.70	0.66	538988.33	1704889.55	N 39 58 30.22	W 80 33 10.83	5.45
	7644.00	89.76	326.13	6671.78	5339.81	1476.05	807.18	-1337.88	0.91	0.04	0.91	539066.80	1704836.02	N 39 58 30.99	W 80 33 11.53	5.48
	7739.00	90.28	325.34	6671.75	5339.78	1570.62	885.69	-1391.37	1.00	0.55	-0.83	539145.31	1704782.54	N 39 58 31.76	W 80 33 12.23	5.51
	7833.00	90.17	326.37	6671.38	5339.41	1664.17	963.49	-1444.13	1.10	-0.12	1.10	539223.10	1704729.78	N 39 58 32.52	W 80 33 12.92	5.54
	7928.00	89.97	326.40	6671.27	5339.30	1758.62	1042.60	-1496.72	0.21	-0.21	0.03	539302.21	1704677.19	N 39 58 33.30	W 80 33 13.61	5.57
	8023.00	90.34	325.05	6671.01	5339.04	1853.19	1121.10	-1550.22	1.47	0.39	-1.42	539380.71	1704623.69	N 39 58 34.07	W 80 33 14.31	5.60
	8117.00	90.10	325.07	6670.65	5338.68	1946.66	1198.16	-1604.06	0.26	-0.26	0.02	539457.76	1704569.88	N 39 58 34.83	W 80 33 15.01	5.62
	8212.00	90.21	324.90	6670.39	5338.42	2041.53	1275.96	-1658.57	0.21	0.12	-0.18	539535.56	1704515.35	N 39 58 35.59	W 80 33 15.72	5.65
	8307.00	90.52	324.90	6669.79	5337.82	2136.22	1353.69	-1713.19	0.33	0.33	0.00	539613.28	1704460.73	N 39 58 36.35	W 80 33 16.43	5.67
	8401.00	90.03	324.82	6669.33	5337.38	2229.92	1430.55	-1767.29	0.53	-0.52	-0.09	539690.15	1704406.63	N 39 58 37.10	W 80 33 17.14	5.69
	8496.00	90.28	325.21	6669.08	5337.11	2324.59	1508.39	-1821.76	0.49	0.26	0.41	539767.98	1704352.16	N 39 58 37.87	W 80 33 17.85	5.72
	8591.00	90.24	324.22	6668.65	5336.68	2419.30	1585.93	-1876.64	1.04	-0.04	-1.04	539845.52	1704207.29	N 39 58 38.63	W 80 33 18.57	5.74
	8685.00	90.24	323.60	6668.25	5336.28	2513.09	1661.99	-1931.88	0.45	0.00	-0.45	539921.57	1704242.05	N 39 58 39.37	W 80 33 19.29	5.76
	8780.00	90.21	323.72	6667.88	5335.91	2607.92	1738.61	-1988.04	0.09	-0.03	-0.08	539998.19	1704185.89	N 39 58 40.12	W 80 33 20.02	5.78
	8875.00	90.21	323.98	6667.53	5335.56	2702.73	1815.32	-2044.08	0.27	0.00	0.27	540074.90	1704129.86	N 39 58 40.87	W 80 33 20.75	5.80
	8969.00	90.24	323.95	6667.16	5335.19	2796.53	1891.33	-2099.38	0.05	0.03	-0.03	540150.90	1704074.56	N 39 58 41.62	W 80 33 21.48	5.82
	9064.00	90.38	323.96	6666.85	5334.68	2891.33	1968.14	-2155.27	0.15	0.15	0.01	540227.71	1704018.66	N 39 58 42.37	W 80 33 22.21	5.84
	9158.00	90.45	323.60	6665.97	5334.00	2985.15	2043.98	-2210.82	0.39	0.07	-0.38	540303.54	1703963.12	N 39 58 43.11	W 80 33 22.93	5.86
	9253.00	90.34	323.74	6665.31	5333.34	3079.98	2120.51	-2267.10	0.19	-0.12	0.15	540380.07	1703906.85	N 39 58 43.86	W 80 33 23.66	5.87
	9348.00	90.27	324.53	6664.81	5332.84	3174.76	2197.49	-2322.75	0.83	-0.07	0.83	540457.05	1703851.19	N 39 58 44.62	W 80 33 24.39	5.89
	9442.00	90.45	323.58	6664.22	5332.25	3268.55	2273.58	-2377.94	1.05	0.19	-1.03	540533.14	1703796.00	N 39 58 45.36	W 80 33 25.11	5.91
	9537.00	90.55	324.62	6663.39	5331.42	3363.33	2350.52	-2433.68	1.12	0.11	1.12	540610.08	1703740.29	N 39 58 46.12	W 80 33 25.84	5.93
	9631.00	90.41	324.14	6662.60	5330.63	3457.08	2426.93	-2488.40	0.53	-0.15	-0.51	540686.48	1703685.55	N 39 58 46.87	W 80 33 26.55	5.95
	9726.00	90.10	325.53	6662.18	5330.21	3551.78	2504.59	-2543.12	1.50	-0.33	1.46	540764.14	1703630.84	N 39 58 47.63	W 80 33 27.27	5.97
	9820.00	90.03	325.69	6662.07	5330.10	3645.35	2582.25	-2596.07	0.39	-0.07	0.38	540841.80	1703577.88	N 39 58 48.39	W 80 33 27.96	5.98
	9915.00	89.62	324.97	6662.36	5330.39	3739.96	2660.48	-2649.98	1.06	-0.43	-0.97	540920.02	1703523.98	N 39 58 49.15	W 80 33 28.66	6.00
	10010.00	89.62	325.07	6662.99	5331.02	3834.63	2738.32	-2704.44	0.11	0.00	0.11	540997.85	1703469.52	N 39 58 49.92	W 80 33 29.38	6.01
	10104.00	90.00	325.54	6663.30	5331.33	3928.27	2815.60	-2757.94	0.64	0.40	0.50	541075.13	1703416.02	N 39 58 50.67	W 80 33 30.07	6.03
	10199.00	90.14	324.94	6663.19	5331.22	4022.91	2893.65	-2812.11	0.65	0.15	-0.63	541153.18	1703361.86	N 39 58 51.44	W 80 33 30.78	6.04
	10294.00	90.34	325.22	6662.79	5330.82	4117.57	2971.54	-2866.49	0.36	0.21	0.29	541231.07	1703307.48	N 39 58 52.20	W 80 33 31.49	6.06
	10389.00	91.06	327.76	6661.63	5329.66	4211.99	3050.74	-2918.93	2.78	0.76	2.67	541310.26	1703255.05	N 39 58 52.98	W 80 33 32.18	6.08
	10483.00	90.69	325.21	6660.19	5328.22	4305.42	3129.10	-2970.82	2.74	-0.39	-2.71	541388.62	1703203.16	N 39 58 53.75	W 80 33 32.88	6.10
	10578.00	90.72	326.10	6659.02	5327.05	4399.99	3207.53	-3024.41	0.94	0.03	0.94	541467.04	1703149.57	N 39 58 54.52	W 80 33 33.56	6.11
	10673.00	90.69	325.97	6657.85	5325.88	4494.50	3286.31	-3077.48	0.14	-0.03	-0.14	541545.82	1703096.50	N 39 58 55.29	W 80 33 34.25	6.13
	10767.00	90.72	326.07	6656.70	5324.73	4588.01	3364.25	-3130.01	0.11	0.03	0.11	541623.78	1703043.97	N 39 58 56.05	W 80 33 34.94	6.14
	10862.00	90.76	325.61	6655.47	5323.50	4682.55	3442.86	-3183.35	0.49	0.04	-0.48	541702.36	1702990.63	N 39 58 56.82	W 80 33 35.63	6.15
	10956.00	90.72	325.89	6654.26	5322.29	4776.11	3520.55	-3236.25	0.30	-0.04	0.30	541780.05	1702937.73	N 39 58 57.58	W 80 33 36.33	6.17
	11051.00	90.79	325.64	6653.00	5321.03	4870.67	3599.08	-3289.69	0.27	0.07	-0.26	541858.58	1702884.29	N 39 58 58.35	W 80 33 37.02	6.18
	11146.00	90.06	325.63	6651.55	5319.58	4965.24	3677.49	-3343.31	0.18	0.18	-0.01	541936.99	1702830.68	N 39 58 59.12	W 80 33 37.72	6.19
	11240.00	90.72	324.17	6650.18	5318.21	5058.92	3754.39	-3397.35	1.57	-0.26	-1.55	542013.88	1702776.64	N 39 58 59.88	W 80 33 38.43	6.21
	11335.00	90.65	324.24	6649.04	5317.07	5153.68	3831.44	-3452.91	0.10	-0.07	0.07	542090.93	1702721.08	N 39 59 0.63	W 80 33 39.16	6.22
	11430.00	90.93	324.99	6647.73	5315.76	5248.40	3908.88	-3507.92	0.84	0.29	0.79	542168.37	1702666.08	N 39 59 1.39	W 80 33 39.87	6.23
	11524.00	90.72	324.33	6646.38	5314.41	5342.11	3985.55	-3562.29	0.74	-0.22	-0.70	542245.03	1702611.71	N 39 59 2.14	W 80 33 40.58	6.24
	11619.00	90.79	324.89	6645.12	5313.15	5438.83	4062.99	-3617.30	0.59	0.07	0.59	542322.47	1702556.70	N 39 59 2.90	W 80 33 41.30	6.25
	11714.00	90.58	324.84	6643.90	5312.02	5531.51	4140.68	-3671.97	0.23	-0.22	-0.05	542400.15	1702502.04	N 39 59 3.66	W 80 33 42.02	6.27
	11808.00	90.69	325.14	6642.78	5310.81	5625.18	4217.68	-3725.69	0.48	0.33	0.32	542477.13	1702448.11	N 39 59 4.42	W 80 33 42.72	6.28
	11903.00	90.83	323.71	6641.36	5309.39	5719.92	4294.62	-3781.15	1.51	-0.00	-1.51	542554.39	1702392.65	N 39 59 5.17	W 80 33 43.44	6.29
	11997.00	90.27	324.52	6640.45	5308.48	5813.70	4371.07	-3836.25	1.05	-0.60	0.86	542630.54	1702337.76	N 39 59 5.92	W 80 33 44.16	6.30
	12092.00	90.14	324.50	6640.11	5308.14	5908.43	4448.45	-3891.36	0.14	-0.14	0.04	542707.92	1702282.65	N 39 59 6.68	W 80 33 44.88	6.31
	12186.00	90.24	324.28	6639.80	5307.83	6002.19	4524.90	-3946.05	0.32	0.11	-0.30	542784.36	1702227.96	N 39 59 7.43	W 80 33 45.60	6.33
	12281.00	90.24	324.61	6639.40	5307.43	6096.93	4602.19	-4001.30	0.35	0.00	0.35	542861.65	1702172.72	N 39 59 8.18	W 80 33 46.32	6.34
	12375.00	90.34	324.78	6638.93	5306.96	6190.65	4678.90	-4055.62	0.21	0.11	0.18	542938.35	1702118.40	N 39 59 8.94	W 80 33 47.03	6.35
	12470.00	90.38	324.03	6638.33	5306.36	6285.34	4756.68	-4110.31	0.16	0.04	0.16	543016.03	1702063.72	N 39 59 9.70	W 80 33 47.74	6.36

51-01658

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	TVDSS (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	BR (°/100ft)	TR (°/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ' ")	Longitude (E/W ° ' ")	Directional Difficulty Index
	12564.00	90.27	324.18	6637.80	5305.83	6379.07	4833.16	-4184.82	0.81	-0.12	-0.80	543092.60	1702009.21	N 39 59 10.45	W 80 33 48.45	6.37
	12659.00	90.24	324.63	6637.38	5305.41	6473.82	4910.41	-4220.11	0.47	-0.03	0.47	543169.85	1701953.92	N 39 59 11.20	W 80 33 49.17	6.38
	12753.00	90.10	324.07	6637.10	5305.13	6567.54	4987.08	-4274.50	0.15	-0.15	0.04	543246.52	1701899.53	N 39 59 11.96	W 80 33 49.88	6.39
	12848.00	90.21	324.39	6636.84	5304.87	6662.28	5064.44	-4329.62	0.32	0.12	-0.29	543323.88	1701844.41	N 39 59 12.71	W 80 33 50.60	6.40
	12942.00	90.41	325.04	6636.33	5304.36	6755.99	5141.17	-4383.92	0.72	0.21	0.69	543400.61	1701790.11	N 39 59 13.47	W 80 33 51.31	6.41
	13037.00	90.38	324.43	6635.68	5303.71	6850.70	5218.74	-4438.77	0.64	-0.03	-0.64	543478.17	1701735.27	N 39 59 14.23	W 80 33 52.03	6.42
	13132.00	90.27	324.63	6635.14	5303.17	6945.43	5296.11	-4493.89	0.24	-0.12	0.21	543555.53	1701680.15	N 39 59 14.98	W 80 33 52.75	6.43
	13226.00	90.17	323.76	6634.78	5302.81	7039.21	5372.34	-4548.88	0.93	-0.11	-0.93	543631.76	1701625.16	N 39 59 15.73	W 80 33 53.47	6.44
	13321.00	90.28	323.88	6634.40	5302.43	7134.03	5449.01	-4604.98	0.16	0.12	0.11	543708.43	1701569.07	N 39 59 16.48	W 80 33 54.20	6.45
	13416.00	90.24	323.74	6633.97	5302.00	7228.84	5525.67	-4661.08	0.13	-0.04	-0.13	543785.09	1701512.96	N 39 59 17.23	W 80 33 54.93	6.46
	13510.00	90.62	324.63	6633.27	5301.30	7322.62	5601.89	-4716.09	1.03	0.40	0.95	543861.31	1701457.96	N 39 59 17.98	W 80 33 55.65	6.47
	13605.00	91.03	326.04	6631.90	5299.93	7417.23	5680.02	-4770.12	1.55	0.43	1.48	543939.43	1701403.94	N 39 59 18.75	W 80 33 56.36	6.48
	13700.00	91.27	329.34	6629.99	5298.02	7511.40	5760.28	-4820.88	3.48	0.25	3.47	544019.69	1701353.18	N 39 59 19.53	W 80 33 57.02	6.49
	13794.00	90.45	326.67	6628.58	5296.61	7604.52	5839.09	-4870.67	2.97	-0.87	-2.84	544099.39	1701303.38	N 39 59 20.31	W 80 33 57.67	6.51
	13848.00	90.52	328.22	6628.12	5296.15	7658.10	5885.50	-4899.73	2.87	0.13	2.87	544144.00	1701274.33	N 39 59 20.76	W 80 33 58.05	6.52
	13930.00	90.52	328.22	6627.38	5295.41	7739.30	5955.20	-4942.91	0.00	0.00	0.00	544214.60	1701231.15	N 39 59 21.44	W 80 33 58.62	6.52

51-01658

Survey Type: Non-Def Survey

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

Survey Program:

Description	Part	MD From (ft)	MD To (ft)	EOU Freq (ft)	Hole Size (in)	Casing Diameter (in)	Survey Tool Type	Borehole / Survey
	1	0.000	22.790	Act Stns	30.000	30.000	SLB_NSG+MSHOT-Depth Only	Original Borehole / Noble Energy SHL-26E-HS Gyro+MWD 0ft to update
	1	22.790	744.000	Act Stns	30.000	30.000	SLB_NSG+MSHOT	Original Borehole / Noble Energy SHL-26E-HS Gyro+MWD 0ft to
	1	744.000	3391.000	Act Stns	30.000	30.000	SLB_INC_ONLY<10	Original Borehole / Noble Energy SHL-26E-HS Gyro+MWD 0ft to
	1	3391.000	5705.000	Act Stns	30.000	30.000	SLB_MWD-STD	Original Borehole / Noble Energy SHL-26E-HS Gyro+MWD 0ft to
	1	5705.000	5800.000	Act Stns	30.000	30.000	SLB_MWD-INC_ONLY>10	Original Borehole / Noble Energy SHL-26E-HS Gyro+MWD 0ft to
	1	5800.000	5847.000	Act Stns	30.000	30.000	SLB_MWD-STD	Original Borehole / Noble Energy SHL-26E-HS Gyro+MWD 0ft to
	1	5847.000	5894.000	Act Stns	30.000	30.000	SLB_MWD-INC_ONLY>10	Original Borehole / Noble Energy SHL-26E-HS Gyro+MWD 0ft to
	1	5894.000	5989.000	Act Stns	30.000	30.000	SLB_MWD-STD	Original Borehole / Noble Energy SHL-26E-HS Gyro+MWD 0ft to
	1	5989.000	6083.000	Act Stns	30.000	30.000	SLB_MWD-INC_ONLY>10	Original Borehole / Noble Energy SHL-26E-HS Gyro+MWD 0ft to
	1	6083.000	6131.000	Act Stns	30.000	30.000	SLB_MWD-STD	Original Borehole / Noble Energy SHL-26E-HS Gyro+MWD 0ft to
	1	6131.000	6320.000	Act Stns	30.000	30.000	SLB_MWD-INC_ONLY>10	Original Borehole / Noble Energy SHL-26E-HS Gyro+MWD 0ft to
	1	6320.000	6367.000	Act Stns	30.000	30.000	SLB_MWD-STD	Original Borehole / Noble Energy SHL-26E-HS Gyro+MWD 0ft to
	1	6367.000	6509.000	Act Stns	30.000	30.000	SLB_MWD-INC_ONLY>10	Original Borehole / Noble Energy SHL-26E-HS Gyro+MWD 0ft to
	1	6509.000	6556.000	Act Stns	30.000	30.000	SLB_MWD-STD	Original Borehole / Noble Energy SHL-26E-HS Gyro+MWD 0ft to
	1	6556.000	7297.000	Act Stns	30.000	30.000	SLB_MWD-INC_ONLY>10	Original Borehole / Noble Energy SHL-26E-HS Gyro+MWD 0ft to
	1	7297.000	13848.000	Act Stns	30.000	30.000	SLB_MWD-STD	Original Borehole / Noble Energy SHL-26E-HS Gyro+MWD 0ft to
	1	13848.000	13930.000	Act Stns	30.000	30.000	SLB_BLIND+TREND	Original Borehole / Noble Energy SHL-26E-HS Gyro+MWD 0ft to

51-01658

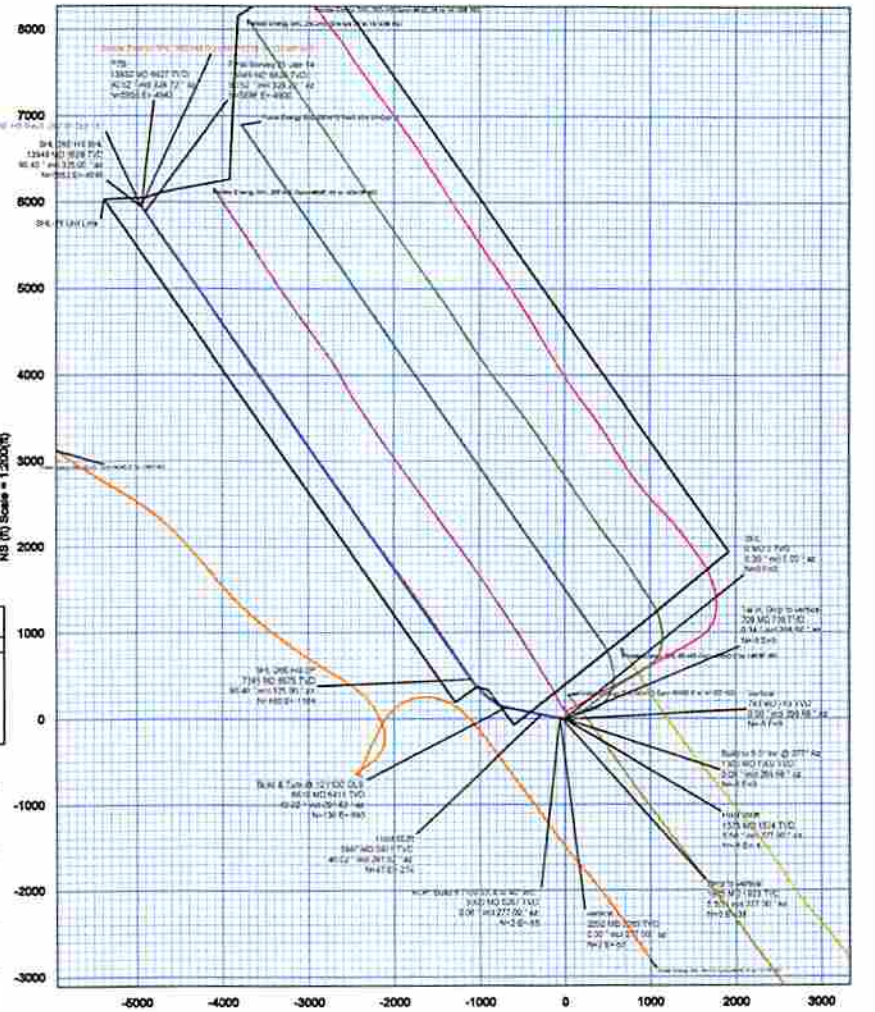
PATHFINDER
A Schlumberger Company

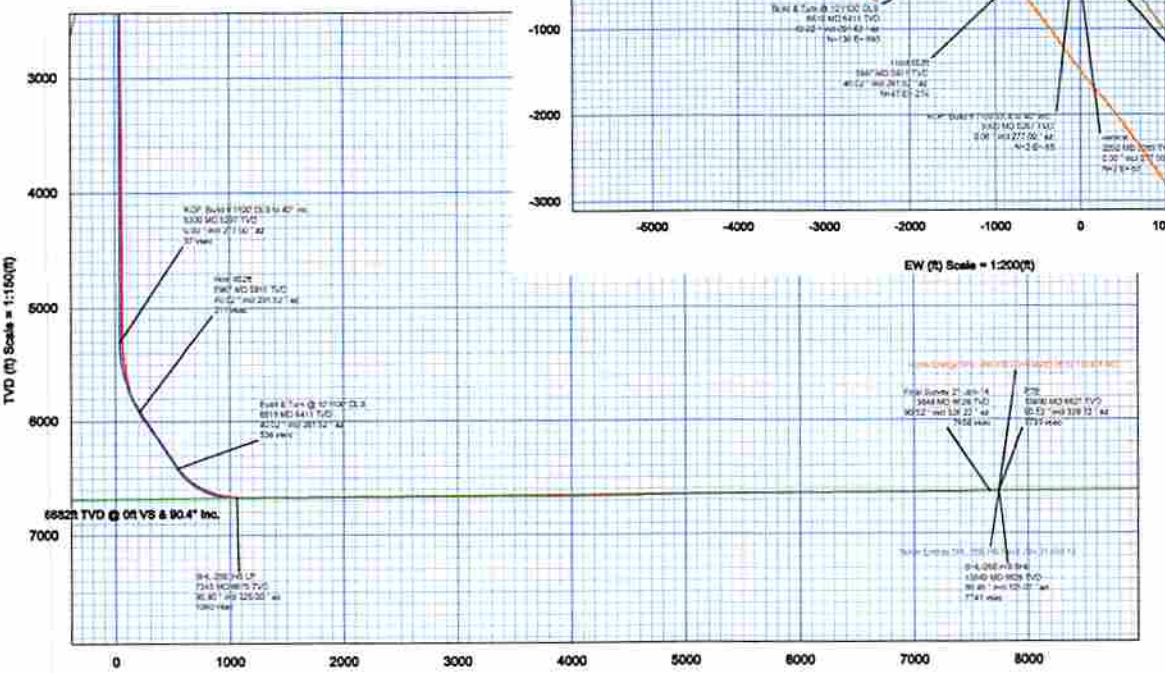
Noble Energy

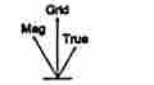
noble energy

Borehole:	Well:	Field:	Structure:
Original Borehole	SHL-26E-HS	WV Marshall County (NAD 27)	Nabors M59

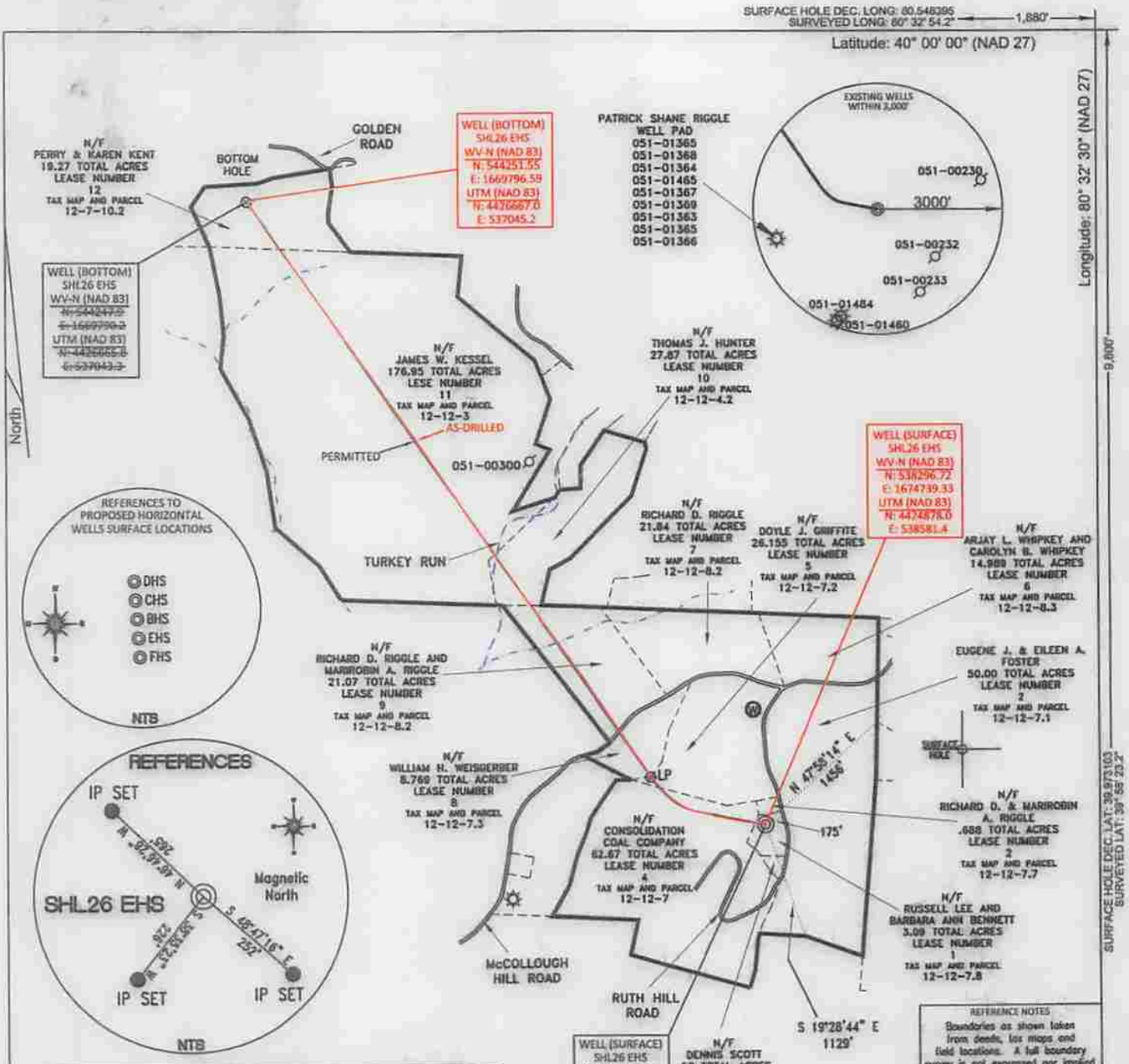
Gravity & Magnetic Parameters				Surface Location (NAD27 West Virginia State Plane, Northern Zone, US Feet)					Miscellaneous		
Model:	HDGM 2013	Dip: 67.502°	Date: 14-Jan-2014	Lat: N 39 58 33.17	Northing: 538259.654ftUS	Grid Conv: -0.669°			Slot: SHL-26E-HS	TVD Ref: KB(1331.97ft above MSL)	
MagDec: -8.417°		FS: 53115.365nT	Gravity FS: 999.545mgn (9.80665 Based)	Lon: W 80 32 54.23	Easting: 1706173.848ftUS	Scale Fact: 0.99995906			Plan: Noble Energy SHL-26E-HS Gyro+MWD 0ft to 13900ft MD		







Grid North
Tot Corr (M->G -7.748°)
Mag Dec (-8.417°)
Grid Conv (-0.669°)



SURFACE HOLE LOCATION	LANDING POINT LOCATION	BOTTOM HOLE LOCATION
UTM 17-NAD 83	UTM 17-NAD 83	UTM 17-NAD 83
N) 4424878.0	N) 4425012.5	N) 4426665.8
E) 538581.6	E) 538242.7	E) 537043.3
NAD 27, WV NORTH	NAD 27, WV NORTH	NAD 27, WV NORTH
N) 538259.47	N) 538719.54	N) 544210.99
E) 1706174.38	E) 1705069.82	E) 1701224.73

FILE #: NOB 002

DRAWING #: 2216

SCALE: PLAT - 1" = 1400' TICK MARK - 1" = 2000'

MINIMUM DEGREE OF ACCURACY: 1/200

PROVEN SOURCE OF ELEVATION: SUBMETER MAPPING GRADE GPS

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 DEPARTMENT OF ENVIRONMENTAL PROTECTION.

Signed:

L.L.S. #2124 : Ernest J. Benchek III

ERNEST J. BENCHEK III LICENSED No. 2124 STATE OF WEST VIRGINIA PROFESSIONAL SURVEYOR

(+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS

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

DATE: AUGUST 8, 2014

OPERATOR'S WELL #: SHL26 EHS AS-DRILLED

API WELL #: 47 (STATE) 51 (COUNTY) 01658 (PERMIT)

Well Type: ☐ Oil ☐ Waste Diposal ☒ Production ☐ Deep
☒ Gas ☐ Liquid Injection ☐ Storage ☒ Shallow

WATERSHED: WHEELING CREEK

ELEVATION: 1,320'

COUNTY/DISTRICT: MARSHALL / SAND HILL

QUADRANGLE: MAJORSVILLE WV-PA

SURFACE OWNER: RUSSELL LEE AND BARBARA ANN BENNETT

ACREAGE: 3.09 +/-

OIL & GAS ROYALTY OWNER: JAMES O. WHIPKEY ET AL

ACREAGE: 326.574 +/-

LEASE NUMBERS:

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

TARGET FORMATION: MARCELLUS

ESTIMATED DEPTH: TVD: 6,698' TMD: 13,986'

WELL OPERATOR: NOBLE ENERGY, INC.

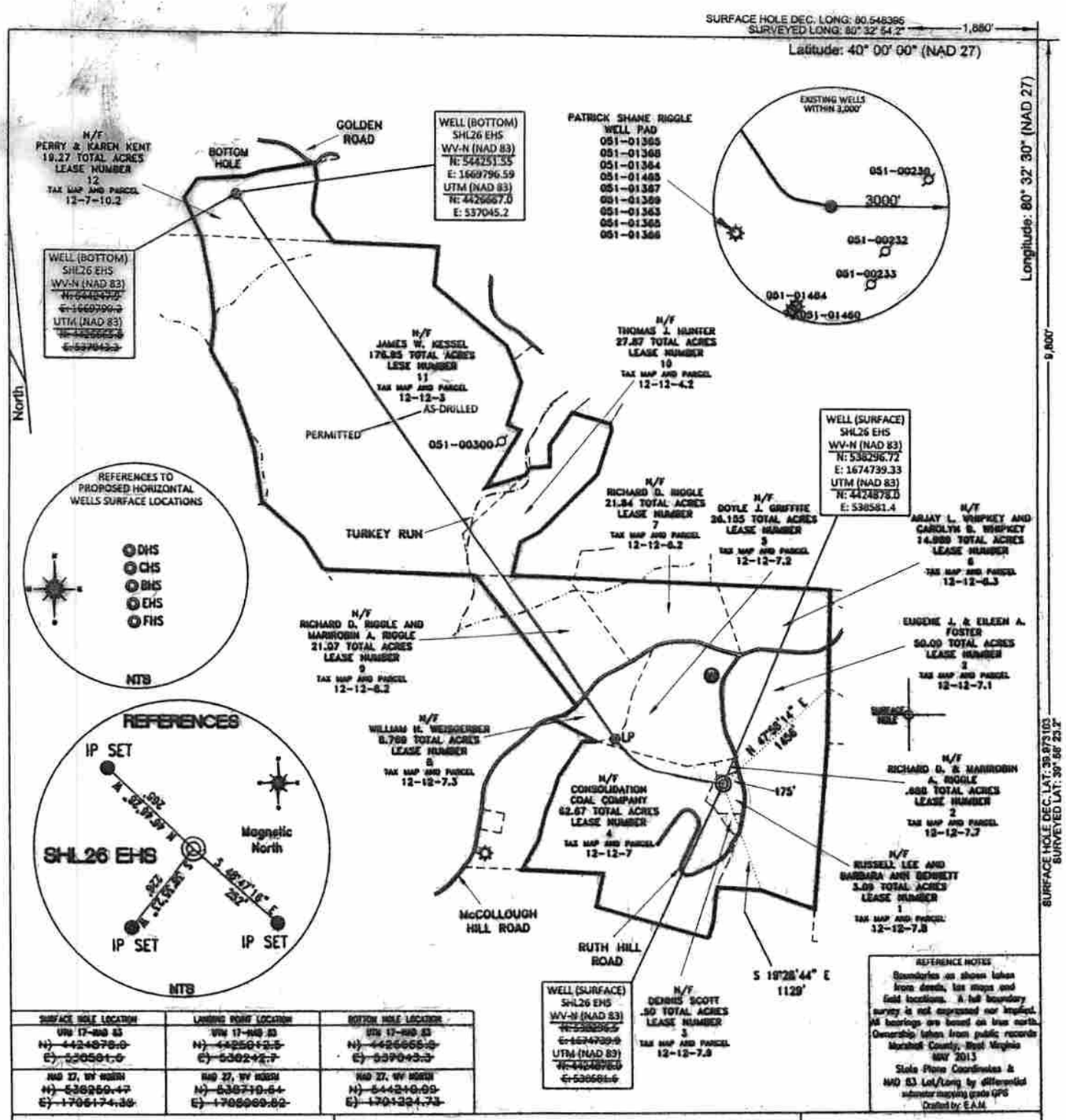
DESIGNATED AGENT: STEVEN M. GREEN

ADDRESS: 333 TECHNOLOGY DRIVE SUITE 116

ADDRESS: 500 VIRGINIA STREET EAST

CITY: CANONSBURG STATE: PA ZIP CODE: 15317

CITY: CHARLESTON STATE: WV ZIP CODE: 25301



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E: 538581.6	E: 538242.7	E: 537043.3
NAD 27, WV NORTH	NAD 27, WV NORTH	NAD 27, WV NORTH
N: 538259.47	N: 538719.64	N: 544210.09
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FILE #: NOB 002

DRAWING #: 2216

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MINIMUM DEGREE OF ACCURACY: 1/200

PROVEN SOURCE OF ELEVATION: SUBMETER MAPPING GRADE GPS

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Signed: _____

L.L.S. #2124 : Ernest J. Benchek III

ERNEST J. BENCHEK III
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No. 2124
STATE OF
WEST VIRGINIA
PROFESSIONAL SURVEYOR

(+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS

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☒ Gas ☐ Liquid Injection ☐ Storage ☒ Shallow

WATERSHED: WHEELING CREEK

ELEVATION : 1,320'

COUNTY/DISTRICT: MARSHALL / SAND HILL

QUADRANGLE : MAJORSVILLE WV-PA

SURFACE OWNER: RUSSELL LEE AND BARBARA ANN BENNETT

ACREAGE: 3.09 +/-

OIL & GAS ROYALTY OWNER: JAMES O. WHIPKEY ET AL

ACREAGE: 326.574 +/-

LEASE NUMBERS: _____

DRILL ☒ CONVERT ☐ DRILL DEEPER ☐ REDRILL ☐ FRACTURE OR STIMULATE ☒
PLUG OFF FORMATION ☐ PERFORATE NEW FORMATION ☐ PLUG & ABANDON ☐
CLEAN OUT & REPLUG ☐ OTHER CHANGE ☐ (SPECIFY): _____

TARGET FORMATION: MARCELLUS

ESTIMATED DEPTH: TVD: 6,698' TMD: 13,986'

WELL OPERATOR : NOBLE ENERGY, INC.

DESIGNATED AGENT : STEVEN M. GREEN

ADDRESS: 333 TECHNOLOGY DRIVE SUITE 116

ADDRESS: 500 VIRGINIA STREET EAST

CITY: CANONSBURG STATE: PA ZIP CODE: 15317

CITY: CHARLESTON STATE: WV ZIP CODE: 25301

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

API 47 - 051 - 01660 County Marshall District Sandhill
Quad Majorsville Pad Name SHL-26 Field/Pool Name
Farm name Russell Lee and Barbara Ann Bennett Well Number SHL26CHS
Operator (as registered with the OOG) Noble Energy Inc.
Address 333 Technology Drive, Suite 116 City Canonsburg State PA Zip 15317

As Drilled location NAD 83/UTM Attach an as-drilled plat, profile view, and deviation survey

Top hole	Northing	4424887.141531	Easting	538580.612706
Landing Point of Curve	Northing	4425284.884596	Easting	538892.156038
Bottom Hole	Northing	4427331.072998	Easting	537411.266825

Elevation (ft) 1310.00 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)
Synthetic Oil Based

Date permit issued 08/19/2013 Date drilling commenced 10/2/2013 Date drilling ceased 12/29/2013
Date completion activities began 03/17/2014 Date completion activities ceased 6/1/2014
Verbal plugging (Y/N) N Date permission granted ____ Granted by ____

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

RECEIVED
Office of Oil and Gas
SEP 11 2014
WV Department of
Environmental Protection

Freshwater depth(s) ft 198', 300' Open mine(s) (Y/N) depths N
Salt water depth(s) ft N/A Void(s) encountered (Y/N) depths N
Coal depth(s) ft 761' to 771' Pittsburgh Cavern(s) encountered (Y/N) depths N
Is coal being mined in area (Y/N) Y

Reviewed by:

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API 47- 051 - 01660 Farm name Russell Lee and Barbara Ann Bennett Well number SHL26CHS

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	36	30	40	N	K-55 94#		
Surface	24	20	418.5	N	J-55 94#		Y
Coal	17 1/2	13 3/8	1233.9	N	J-55 54.5#		Y
Intermediate 1	12 3/8	9 5/8	3218	N	J-55 36#		Y
Intermediate 2							
Intermediate 3							
Production	8 3/4	5 1/2	15738	N	P-110 23#		Y
Tubing							
Packer type and depth set							

Comment Details 2 Baskets on Surface Casing

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	Type 1	487	15.6	1.2	104	0	8
Coal	Type 1	1027	15.6	1.2	220	0	8
Intermediate 1	Class A	1160	16.2	1.09	225	0	19
Intermediate 2							
Intermediate 3							
Production	Class A	2681	14.8	1.26	597	3000	9
Tubing							

Drillers TD (ft) 15,748 Loggers TD (ft) 15713
Deepest formation penetrated Marcellus Plug back to (ft) not a pilot Hole
Plug back procedure not a pilot Hole

Kick off depth (ft) 7455

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
4 Centralizers on Surface casing, 10 Centralizers on Coal casing. 40 Centralizers on Intermediate casing. 253 Centralizers on Production casing.
On the Surface, Coal, and Intermediate Strings, the centralizers are on every 3 joint of casing.
On the Production String, they are on every 3rd from Surface to Top of Curve, then every joint until TD.

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

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API 47- 051 - 01660 Farm name Russell Lee and Barbara Ann Bennett Well number SHL26CHS

PERFORATION RECORD

Stage No.	Perforation date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formation(s)

PLEASE SEE ATTACHED PERFORATION RECORD

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 (bbls)	Amount of Nitrogen/other (units)

PLEASE SEE ATTACHED STIMULATION INFORMATION PER STAGE SHEET

Please insert additional pages as applicable.

PERFORATION RECORD

API: 47-051-01660 Farm name: Russell Lee and Barbara Ann Bennett Well Name: SHL-26C-HS

Stage No.	Stim Date	Top Perf	Bottom Perf	# of Perfs	Formation
TOE SLEEVE	3/7/2014	15612	15,614		Marcellus
1	3/17/2014	15425	15,592	48	Marcellus
2	3/18/2014	15175	15,377	40	Marcellus
3	3/19/2014	14873	15,127	40	Marcellus
4	3/19/2014	14573	14,827	40	Marcellus
5	3/19/2014	14273	14,527	40	Marcellus
6	3/21/2014	14025	14,227	40	Marcellus
7	3/21/2014	13723	13,977	40	Marcellus
8	3/22/2014	13475	13,677	40	Marcellus
9	3/23/2014	13173	13,427	40	Marcellus
10	3/24/2014	12873	13,127	40	Marcellus
11	3/24/2014	12573	12,827	40	Marcellus
12	3/25/2014	12273	12,527	40	Marcellus
13	3/26/2014	11973	12,227	40	Marcellus
14	4/22/2014	11673	11,927	40	Marcellus
15	4/22/2014	11373	11,627	40	Marcellus
15 REPERF	4/23/2014	11363	11,480	40	Marcellus
16	4/24/2014	11073	11,327	40	Marcellus
17	4/24/2014	10773	11,027	40	Marcellus
18	4/24/2014	10475	10,727	48	Marcellus
19	4/25/2014	10175	10,427	48	Marcellus
20	4/25/2014	9875	10,127	48	Marcellus
21	4/25/2014	9575	9,827	48	Marcellus
22	4/25/2014	9275	9,527	48	Marcellus
23	4/26/2014	8975	9,227	48	Marcellus
24	4/26/2014	8675	8,927	48	Marcellus
25	4/26/2014	8375	8,627	48	Marcellus
26	4/27/2014	8075	8,327	48	Marcellus
27	4/27/2014	7775	8,027	48	Marcellus
28	4/27/2014	7475	7,727	48	Marcellus

STIMULATION INFORMATION PER STAGE

API: 47-051-01660 Farm name: Russell Lee and Barbara Ann Bennett Well Name: SHL-26C-HS

Stage No.	Stim Date	Avg Rate (bpm)	ATP (psi)	Max BD Pressure	ISIP (psi)	Proppant (lbs)	Water (BBLS)	Amount of N^2/ other
1 Inj Test	3/17/2014		7427		6070	0	476.4048	
1.1	3/17/2014	86.0	8548	5467		169,058	7566.976	
1.2	3/17/2014	86.4	8538	5467		165,687	6143.524	
1.3	3/18/2014	88.4	8491	5400	3665	164,798	5659.571	
2.1	3/18/2014	82.7	8254	6024		167,673	6957.986	
2.2	3/18/2014	86.1	8385	5319		168,349	6308.405	
2.3	3/19/2014	88.1	8590	5233	4164	167,441	5521.619	
3.1	3/19/2014	87.6	8267	5609		202,095	6382.119	
3.2	3/19/2014	88.2	8065	5315		198,908	5556.524	
3.3	3/19/2014	88.1	8869	5217	3942	197,386	5304.833	
4.1	3/20/2014	87.4	8275	5870		198,965	5987.719	
4.2	3/20/2014	87.9	8266	5714		199,935	5340.595	
4.3	3/20/2014	90.7	8316	5727	3997	201,591	5325.571	
5.1	3/20/2014	88.7	8253	6036		201,402	6476.786	
5.2	3/20/2014	86.8	7918	5172		204,360	5357.667	
5.3	3/20/2014	86.4	8002	5310	3999	204,595	5092.333	
6.1	3/21/2014	81.5	9068	5994		167,198	6398.765	
6.2	3/21/2014	83.6	8270	6338		168,225	6766.595	
6.3	3/21/2014	87.9	8339	6002	4063	164,059	4769.81	
7.1	3/22/2014	87.5	8157	5808		199,733	6367.581	
7.2	3/22/2014	86.0	8125	5957		199,058	5963.143	
7.3	3/22/2014	87.9	8145	6156	3876	202,823	5401.586	
8.1	3/23/2014	85.1	7952	5324		168,379	6411.19	
8.2	3/23/2014	88.1	8097	4499		168,958	4760.429	
8.3	3/23/2014	88.4	7978	5788	4305	164,464	4677.146	
9.1	3/23/2014	88.7	9007	5498		205,479	6042.712	
9.2	3/23/2014	89.0	7772	5073		195,681	5238.548	
9.3	3/23/2014	88.4	7784	4927	4150	198,666	5057.167	
10.1	3/24/2014	87.8	8820	5288		200,070	6508.567	
10.2	3/24/2014	88.8	7685	5346		200,012	5283.762	
10.3	3/24/2014	88.7	7809	5645	4158	188,666	5057.881	
11.1	3/25/2014	86.1	7965	5681		208,477	7120.379	
11.2	3/25/2014	74.6	8451	6152		202,117	5511.595	
11.3	3/25/2014	82.9	8438	6205	4094	202,744	5195.696	
12.1	3/25/2014	86.7	7605	5679		208,193	6077.054	
12.2	3/26/2014	86.7	8643	5767		195,411	5242.524	
12.3	3/26/2014	86.9	7574	5584	3999	193,796	5552.667	
13.1	3/26/2014	85.8	7829	5833		201,320	6230.869	
13.2	3/26/2014	87.4	8064	5944		204,668	5641.31	
13.3	3/26/2014	87.0	7456	5351	4570	194,216	5048.186	
14.1	4/22/2014	87.0	7230	5802		201,760	5794.167	

STIMULATION INFORMATION PER STAGE

API: 47-051-01660 Farm name: Russell Lee and Barbara Ann Bennett Well Name: SHL-26C-HS

Stage No.	Stim Date	Avg Rate (bpm)	ATP (psi)	Max BD Pressure	ISIP (psi)	Proppant (lbs)	Water (BBLS)	Amount of N^2/ other
14.2	4/22/2014	86.6	7665	6182		202,421	5463.357	
14.3	4/22/2014	87.1	7461	5917	4065	198,448	5241.976	
15.1	4/22/2014	87.4	7797	5686		202,150	5560.42	
15.2	4/22/2014	84.9	8295	5854		199,069	5201.786	
15.3	4/22/2014	31.1	9245	6706	5911		2695.476	
15B	4/23/2014	83.8	7973		4040	204,500	5927.543	
16.1	4/23/2014	90.3	7607	5438		201,298	6039.072	
16.2	4/23/2014	90.1	7779	5670		199,838	5752.905	
16.3	4/24/2014	90.6	7835	5187	4446	200,188	5750.19	
17.1	4/24/2014	90.1	7577	5031		198,040	6804.167	
17.2	4/24/2014	47.1	8835	8478		918	1669.31	
17B.2	4/24/2014	87.1	7494	6265		200,933	5449.986	
17B.3	4/24/2014	87.5	7355	5607	4507	203,544	5297.524	
18.1	4/24/2014	90.0	7088	5466		200,774	5988.181	
18.2	4/24/2014	90.4	7400	4891		200,384	5685.286	
18.3	4/24/2014	90.2	7253	4505	4503	201,030	5449.476	
19.1	4/25/2014	90.7	7178	5456		200,117	5773.831	
19.2	4/25/2014	90.4	7460	5011		200,344	5578.286	
19.3	4/25/2014	88.3	7677	6080	4469	199,821	5790.976	
20.1	4/25/2014	85.8	7080	5465		200,400	6584.238	
20.2	4/25/2014	86.9	7219	5398		201,219	5456.143	
20.3	4/25/2014	87.2	7162	5812	4613	201,501	5269.857	
21.1	4/25/2014	86.5	7187	5295		201,346	5402.571	
21.2	4/25/2014	83.2	7448	5143		199,870	5974.286	
21.3	4/25/2014	88.3	6751	5272	4506	199,496	5554.452	
22.1	4/25/2014	89.2	6986	5511		200,665	5820.671	
22.2	4/25/2014	88.9	7363	5716		200,346	5547.286	
22.3	4/25/2014	72.5	8501	5646	4353	199,798	10776.71	
23.1	4/26/2014	80.1	7842	4864		200,198	6792.605	
23.2	4/26/2014	77.9	7892	6685		199,714	5519.452	
23.3	4/26/2014	83.5	7643	6113	4390	201,316	5507.333	
24.1	4/26/2014	87.7	6834	5586		200,764	6035.371	
24.2	4/26/2014	87.7	7309	5544		199,628	5514.286	
24.3	4/26/2014	88.8	7357	5233	3976	198,957	5468.667	
25.1	4/27/2014	86.2	6943	6183		189,743	6317.441	
25.2	4/27/2014	87.9	7255	8062		207,843	5979.286	
25.3	4/27/2014	88.2	7483	5767	4198	206,836	5103.024	
26.1	4/27/2014	83.5	6914	5039		195,253	6083.975	
26.2	4/27/2014	79.5	7545	5955		206,245	5436.548	
26.3	4/27/2014	87.4	7523	6044	4195	197,509	4973.571	
27.1	4/27/2014	88.3	6847	6406		200,459	5852.051	

STIMULATION INFORMATION PER STAGE

API: 47-051-01660 Farm name: Russell Lee and Barbara Ann Bennett Well Name: SHL-26C-HS

Stage No.	Stim Date	Avg Rate (bpm)	ATP (psi)	Max BD Pressure	ISIP (psi)	Proppant (lbs)	Water (BBLS)	Amount of N^2/ other
27.2	4/27/2014	88.1	7399	5939		200,411	5830.286	
27.3	4/27/2014	88.1	7831	5862	4300	199,996	5597.571	
28.1	4/28/2014	88.7	6559	5680		200,646	5839.451	
28.2	4/28/2014	89.2	6645	5154		199,820	5551.286	
28.3	4/28/2014	88.9	6650	5011	4467	200,898	5361.167	

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API 47- 051 - 01660 Farm name Russell Lee and Barbara Ann Bennett Well number SHL26CHS

PRODUCING FORMATION(S)	DEPTHS	
Marcellus	6657.7 TVD	15748 MD

Please insert additional pages as applicable.

GAS TEST ☐ Build up ☐ Drawdown ■ Open Flow OIL TEST ■ Flow ☐ Pump

SHUT-IN PRESSURE Surface _____ psi Bottom Hole _____ psi DURATION OF TEST _____ hrs

OPEN FLOW	Gas	Oil	NGL	Water	GAS MEASURED BY
	2678 mcfpd	0 bpd	121 bpd	1176 bpd	☐ Estimated ☐ Orifice ☐ Pilot

LITHOLOGY/ FORMATION NAME	TOP DEPTH IN FT TVD	BOTTOM DEPTH IN FT TVD	TOP DEPTH IN FT MD	BOTTOM DEPTH IN FT MD	DESCRIBE ROCK TYPE AND RECORD QUANTITY AND TYPE OF FLUID (FRESHWATER, BRINE, OIL, GAS, H_2S, ETC)
	0		0		

PLEASE SEE FORMATIONS SHEET

Please insert additional pages as applicable.

Drilling Contractor Nabors Drilling USA, LP
Address 515 West Greens Rd, Suite 1000 City Houston State TX Zip 77067-4525

Logging Company Horizon Well Logging, LLC
Address 7136 S. Yale Ave. Suite 414 City Tulsa State OK Zip 74136

Cementing Company CalFrac
Address 717 17th St., Suite 1445 City Denver State OK Zip 80202

Stimulating Company Halliburton Energy Services
Address 121 Champion Way, Suite 210 City Canonsburg State PA Zip 15317

Please insert additional pages as applicable.

Completed by Dee Swiger Telephone 724-820-3061
Signature Dee Swiger Title Reg. Analyst Date 8-8-14

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

FORMATIONS

API	47-051-5101660	Farm Name	Russell Lee and Barbara Ann Bennett	Well Name	SHL26C

Lithology/Formation	Top Depth in FT TVD	Bottom Depth in FT TVD	Top Depth in Ft MD	Bottom Depth in FT MD	Describe Rock Type and Record Quantity and Type of Fluid (Freshwater, Brine, Oil, Gas, H2S, ETC)
Shale	0	808	0	808	
Pittsburgh Coal	808	817	808	817	
Shale and Sandstone	817	1264	817	1264	
Dunkard Sand	1264	1275	1264	1275	
Shale	1275	1446	1275	1446	
Gas Sand	1446	1485	1446	1485	
Shale	1485	1577	1485	1577	
1st Salt Sand	1577	1601	1577	1601	
Shale	1601	1610	1601	1611	
2nd Salt Sand	1610	1655	1611	1656	
Shale	1655	1738	1656	1739	
Maxton Sand	1738	1750	1739	1751	
Shale	1750	1793	1751	1794	
Big Lime	1793	1873	1794	1875	
Big Injun	1873	2067	1875	2069	
Price	2067	2425	2069	2427	
Murrysville	2425	2439	2427	2441	
Shale	2439	2636	2441	2638	
50' Sand	2636	2638	2638	2640	
Shale	2638	2691	2640	2693	
30' Sand	2691	2700	2693	2702	
Shale	2700	2742	2702	2744	
Gordon Stray	2742	2757	2744	2759	
Shale	2757	2793	2759	2795	
Gordon	2793	2806	2795	2808	
Shale	2806	2902	2808	2904	
Fifth Sand	2902	2936	2904	2938	
Shale	2936	3342	2938	3345	
Speechley Sand	3342	3370	3345	3373	
Shale	3370	4378	3373	4381	
Warren Sand	4378	4387	4381	4390	
Shale	4387	5045	4390	5097	
Java Shale	5045	5216	5097	5317	
Pipe Creek Shale	5216	5273	5317	5388	
Angola Shale	5273	5898	5388	6183	
Rhinestreet	5898	6314	6183	6733	
Cashaqua	6314	6405	6733	6856	
Middlesex	6405	6440	6856	6907	
West River	6440	6492	6907	6991	
Burkett	6492	6515	6991	7031	
Tully Limestone	6515	6545	7031	7087	
Hamilton	6545	6656	7087	7386	
Marcellus	6656	6706	7386	not encountered	Gas

Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date:	3/17/2014
Job End Date:	4/28/2014
State:	West Virginia
County:	Marshall
API Number:	47-051-01660-00-00
Operator Name:	Noble Energy, Inc.
Well Name and Number:	SHL26 C
Longitude:	-80.54840600
Latitude:	39.97318600
Datum:	NAD27
Federal/Tribal Well:	NO
True Vertical Depth:	6,659
Total Base Water Volume (gal):	20,657,586
Total Base Non Water Volume:	0

FracFocus Chemical Disclosure Registry

GROUNDWATER PROTECTION COUNCIL

Oil & Gas

51-01660

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
Fresh Water	Operator	Base Fluid					
			Fresh Water	7732-18-5	100.00000	90.56068	Density = 8.340
SAND - PREMIUM WHITE	Halliburton	Proppant					
			Crystalline silica, quartz	14808-60-7	100.00000	6.78130	
SAND - COMMON WHITE	Halliburton	Proppant					
			Crystalline silica, quartz	14808-60-7	100.00000	1.69401	
HYDROCHLORIC ACID 5-10%	Halliburton	Solvent					
			Hydrochloric acid	7647-01-0	10.00000	0.08220	
FDP-S1078-12	Halliburton	Friction Reducer					
			Hydrotreated light petroleum distillate	64742-47-8	30.00000	0.02089	
			Ammonium chloride	12125-02-9	10.00000	0.00696	
			Alcohols, C12-16, ethoxylated	68551-12-2	10.00000	0.00696	
			9-Octadecenamide, n,n-bis-2 (hydroxy-ethyl)-,(Z)	93-83-4	5.00000	0.00348	
FE-1A ACIDIZING COMPOSITION	Halliburton	Additive					
			Acetic anhydride	108-24-7	100.00000	0.00426	
			Acetic acid	64-19-7	60.00000	0.00256	

BE-9W	Halliburton	Biocide					
			Tributyl tetradecyl phosphonium chloride	81741-28-8	10.00000	0.00402	
Scalechek LP-65 Scale Inhibitor	Halliburton	Scale Inhibitor					
			Ammonium chloride	12125-02-9	10.00000	0.00236	
Biovert NWB	Halliburton	Viscosifier					
			Polylactide resin	Confidential	100.00000	0.00209	Denise Tuck, Halliburton 3000 N. Sam Houston Pkwy E., Houston, TX 77032 281-871-6226
LoSurf-300D	Halliburton	Non-Ionic Surfactant					
			Ethanol	64-17-5	60.00000	0.00086	
			Heavy aromatic petroleum naphtha	64742-94-5	30.00000	0.00043	
			Naphthalene	91-20-3	5.00000	0.00007	
			Poly(oxy-1,2-ethanediyl), alpha-(4-nonylphenyl)-omega-hydroxy-, branched	127087-87-0	5.00000	0.00007	
			1,2,4 Trimethylbenzene	95-63-6	1.00000	0.00001	
HAI-OS ACID INHIBITOR	Halliburton	Corrosion Inhibitor					
			Methanol	67-56-1	60.00000	0.00042	
			Propargyl alcohol	107-19-7	10.00000	0.00007	
FDP-S1125-14	Halliburton	Diverter					
			Contains no hazardous ingredients	NA	100.00000	0.00008	
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 Ingredient(s)					
			Water	7732-18-5		0.89725	
		Other Ingredient(s)					
			Propylene glycol	57-55-6		0.02411	
		Other Ingredient(s)					
			Polyacrylate	Confidential		0.02089	
		Other Ingredient(s)					
			Inorganic salt	Confidential		0.02089	
		Other Ingredient(s)					
			Organic phosphonate	Confidential		0.01417	
		Other Ingredient(s)					
			Fatty acid ester	Confidential		0.00348	
		Other Ingredient(s)					
			Oxyalkylated phenolic resin	Confidential		0.00043	
		Other Ingredient(s)					
			Formaldehyde	50-00-0		0.00024	
		Other Ingredient(s)					
			Fatty acids, tall oil	Confidential		0.00021	
		Other Ingredient(s)					

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			Alcohols, C14-C15, ethoxylated	68951-67-7		0.00021	
		Other Ingredient(s)					
			Reaction product of acetophenone, formaldehyde, thiourea and oleic acid in dimethyl formamide	68527-49-1		0.00021	
		Other Ingredient(s)					
			Oxyalkylated phenolic resin	Confidential		0.00014	
		Other Ingredient(s)					
			Proprietary Component	Confidential		0.00008	
		Other Ingredient(s)					
			Olefins	Confidential		0.00004	
		Other Ingredient(s)					
			Olefins	Confidential		0.00004	
		Other Ingredient(s)					
			Olefins	Confidential		0.00001	
		Other Ingredient(s)					
			Olefins	Confidential		0.00001	

* 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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PATHFINDER
A Schlumberger Company

Noble Energy SHL-26C-HS Surveys 0ft to 15748ft MD Survey Geodetic Report

(Def Survey)

noble energy

Report Date:	December 30, 2013 - 10:12 AM	Survey / DLS Computation:	Minimum Curvature / Lubinski
Client:	Noble Energy	Vertical Section Azimuth:	335.335 ° (Grid North)
Field:	WV Marshall County (NAD 27)	Vertical Section Origin:	0.000 ft, 0.000 ft
Structure / Slot:	Noble Energy SHL-26 Pad / SHL-26C-HS	TVD Reference Datum:	KB
Well:	SHL-26C-HS	TVD Reference Elevation:	1331.610 ft above MSL
Borehole:	Original Borehole	Seabed / Ground Elevation:	1309.180 ft above MSL
UWI / API#:	Unknown / Unknown	Magnetic Declination:	-8.414 °
Survey Name:	Noble Energy SHL-26C-HS Surveys 0ft to 15748ft MD	Total Gravity Field Strength:	999.3454mgn (9.80665 Based)
Survey Date:	December 10, 2013	Gravity Model:	GARM
Tort / AHD / DDI / ERD Ratio:	256.869 ° / 10249.765 ft / 6.792 / 1.532	Total Magnetic Field Strength:	53128.106 nT
Coordinate Reference System:	NAD27 West Virginia State Plane, Northern Zone, US Feet	Magnetic Dip Angle:	67.511 °
Location Lat / Long:	N 39° 58' 23.46679", W 80° 32' 54.25832"	Declination Date:	December 10, 2013
Location Grid N/E Y/X:	N 538289.639 ftUS, E 1706171.797 ftUS	Magnetic Declination Model:	HDGM 2013
CRS Grid Convergence Angle:	-0.6686 °	North Reference:	Grid North
Grid Scale Factor:	0.99995906	Total Corr Mag North->Grid North:	-0.6686 °
Version / Patch:	2.7.998.0	Total Corr Mag ->Grid North:	-7.7456 °
		Local Coord Referenced To:	Well Head

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	TVDSS (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	BR (°/100ft)	TR (°/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ' ")	Longitude (E/W ° ' ")	Directional Difficulty Index
SHL	0.00	0.00	0.00	0.00	-1331.61	0.00	0.00	0.00	N/A	N/A	N/A	538289.64	1706171.80	N 39 58 23.47	W 80 32 54.26	0.00
	123.00	0.84	141.90	123.00	-1208.61	-0.88	-0.71	0.58	0.68	0.68	0.00	538288.93	1706172.35	N 39 58 23.46	W 80 32 54.25	0.00
	223.00	0.76	131.52	222.99	-1108.62	-2.20	-1.73	1.51	0.17	-0.08	-10.38	538287.91	1706173.30	N 39 58 23.45	W 80 32 54.24	0.36
	323.00	0.76	125.05	322.98	-1008.63	-3.38	-2.55	2.54	0.09	0.00	-6.47	538287.09	1706174.34	N 39 58 23.44	W 80 32 54.23	0.60
	423.00	0.94	112.21	422.97	-908.64	-4.55	-3.24	3.85	0.28	0.18	-12.84	538286.40	1706175.64	N 39 58 23.44	W 80 32 54.21	0.84
	523.00	0.29	62.61	522.96	-808.65	-5.13	-3.43	4.83	0.78	-0.65	-49.60	538286.21	1706176.63	N 39 58 23.43	W 80 32 54.20	1.12
	623.00	0.84	358.86	622.96	-708.65	-4.45	-2.58	5.04	0.76	0.55	-63.75	538287.06	1706176.84	N 39 58 23.44	W 80 32 54.19	1.31
	723.00	1.13	347.24	722.94	-608.67	-2.81	-0.89	4.81	0.35	0.29	-11.62	538288.75	1706176.61	N 39 58 23.46	W 80 32 54.20	1.45
	823.00	0.47	346.85	822.93	-508.68	-1.45	0.47	4.50	0.66	-0.66	-0.39	538290.11	1706176.29	N 39 58 23.47	W 80 32 54.20	1.60
	923.00	0.39	343.53	922.93	-408.68	-0.71	1.20	4.31	0.08	-0.08	-3.32	538290.84	1706176.10	N 39 58 23.48	W 80 32 54.20	1.64
	1023.00	0.15	307.76	1022.93	-308.68	-0.25	1.61	4.11	0.28	-0.24	-35.77	538291.25	1706175.90	N 39 58 23.48	W 80 32 54.21	1.69
	1123.00	0.10	287.41	1122.93	-208.68	-0.08	1.71	3.92	0.07	-0.05	-20.35	538291.35	1706175.72	N 39 58 23.48	W 80 32 54.21	1.70
	1178.00	0.09	237.83	1177.93	-153.68	-0.05	1.71	3.85	0.14	-0.07	-90.15	538291.35	1706175.65	N 39 58 23.48	W 80 32 54.21	1.71
	1366.00	1.35	52.80	1365.91	34.30	0.42	3.00	5.53	0.75	0.69	93.07	538292.64	1706177.33	N 39 58 23.50	W 80 32 54.19	1.90
	1413.00	2.07	56.98	1412.89	81.28	0.66	3.80	6.68	1.55	1.53	8.89	538293.43	1706178.48	N 39 58 23.51	W 80 32 54.17	2.00
	1461.00	2.69	61.46	1460.85	129.24	0.86	4.81	8.40	1.35	1.29	9.33	538294.44	1706180.20	N 39 58 23.52	W 80 32 54.15	2.09
	1508.00	3.43	64.71	1507.78	176.17	0.95	5.93	10.64	1.62	1.57	6.91	538295.57	1706182.44	N 39 58 23.53	W 80 32 54.12	2.19
	1555.00	4.26	71.27	1554.67	223.06	0.79	7.10	13.57	2.03	1.81	13.96	538296.74	1706185.37	N 39 58 23.54	W 80 32 54.09	2.31
	1602.00	4.65	69.41	1601.53	269.92	0.47	8.33	17.02	0.85	0.79	-3.96	538297.97	1706188.81	N 39 58 23.55	W 80 32 54.04	2.39
	1650.00	5.29	70.55	1649.35	317.74	0.13	9.75	20.93	1.35	1.33	2.38	538299.39	1706192.72	N 39 58 23.57	W 80 32 53.99	2.48
	1697.00	5.85	68.85	1696.13	364.52	-0.21	11.34	25.20	1.24	1.19	-3.62	538300.98	1706197.00	N 39 58 23.58	W 80 32 53.94	2.57
	1745.00	6.16	68.97	1743.86	412.25	-0.53	13.14	29.89	0.65	0.65	0.25	538302.78	1706201.68	N 39 58 23.60	W 80 32 53.88	2.64
	1839.00	5.45	65.73	1837.38	505.77	-0.88	16.79	38.66	0.83	-0.76	-3.45	538306.43	1706210.46	N 39 58 23.64	W 80 32 53.76	2.76
	1934.00	4.52	62.45	1932.02	600.41	-0.72	20.37	46.10	1.02	-0.98	-3.45	538310.01	1706217.89	N 39 58 23.67	W 80 32 53.67	2.86
	2029.00	3.79	69.87	2026.77	695.16	-0.78	23.19	52.36	0.95	-0.77	7.81	538312.82	1706224.16	N 39 58 23.70	W 80 32 53.59	2.94
	2123.00	2.30	66.93	2120.64	789.03	-1.08	25.00	57.02	1.59	-1.59	-3.13	538314.63	1706228.81	N 39 58 23.72	W 80 32 53.53	3.02
	2217.00	1.40	56.97	2214.59	882.98	-0.96	26.36	59.71	1.01	-0.96	-10.60	538316.00	1706231.51	N 39 58 23.73	W 80 32 53.50	3.07
	2312.00	0.79	66.11	2309.57	977.96	-0.80	27.26	61.29	0.67	-0.64	9.62	538316.90	1706233.08	N 39 58 23.74	W 80 32 53.48	3.09
	2407.00	0.93	59.13	2404.56	1072.95	-0.73	27.92	62.55	0.18	0.15	-7.35	538317.56	1706234.34	N 39 58 23.75	W 80 32 53.46	3.11
	2501.00	1.16	58.58	2498.54	1166.93	-0.54	28.81	64.01	0.24	0.24	-0.59	538318.44	1706235.81	N 39 58 23.76	W 80 32 53.44	3.12
	2596.00	0.66	55.58	2593.53	1261.92	-0.33	29.62	65.28	0.53	-0.53	-3.18	538319.25	1706237.08	N 39 58 23.77	W 80 32 53.42	3.14
	2691.00	0.65	63.35	2688.52	1356.91	-0.22	30.17	66.22	0.09	-0.01	8.20	538319.81	1706238.01	N 39 58 23.77	W 80 32 53.41	3.15
	2785.00	0.71	52.85	2782.52	1450.91	-0.07	30.76	67.16	0.15	0.06	-11.17	538320.40	1706238.95	N 39 58 23.78	W 80 32 53.40	3.16
	2880.00	0.83	50.18	2877.51	1545.90	0.23	31.55	68.16	0.13	0.13	-2.81	538321.19	1706239.95	N 39 58 23.79	W 80 32 53.39	3.17
	2975.00	0.99	48.82	2972.50	1640.89	0.65	32.54	69.30	0.17	0.17	-1.43	538322.17	1706241.10	N 39 58 23.80	W 80 32 53.37	3.18
	3069.00	1.19	47.21	3066.48	1734.87	1.18	33.73	70.63	0.22	0.21	-1.71	538323.37	1706242.42	N 39 58 23.81	W 80 32 53.36	3.20
	3164.00	1.30	44.85	3161.46	1829.85	1.87	35.17	72.11	0.13	0.12	-2.48	538324.81	1706243.91	N 39 58 23.82	W 80 32 53.34	3.21
	3297.00	1.16	48.07	3294.43	1962.82	2.79	37.14	74.18	0.12	-0.11	2.42	538326.77	1706245.97	N 39 58 23.84	W 80 32 53.31	3.23
	3391.00	0.22	255.47	3388.42	2056.81	3.11	37.73	74.71	1.45	-1.00	-162.34	538327.36	1706246.51	N 39 58 23.85	W 80 32 53.30	3.26

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Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	TVDSS (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	BR (°/100ft)	TR (°/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ' ")	Longitude (E/W ° ' ")	Directional Difficulty Index
	3491.00	0.45	293.15	3488.42	2156.81	3.43	37.83	74.17	0.31	0.23	37.68	538327.47	1706245.96	N 39 58 23.85	W 80 32 53.31	3.27
	3580.00	0.03	281.87	3577.42	2245.81	3.98	38.07	73.37	0.23	0.20	-12.67	538327.71	1706245.16	N 39 58 23.85	W 80 32 53.32	3.28
	3675.00	0.49	286.65	3672.41	2340.80	4.56	38.30	72.47	0.16	-0.15	5.24	538327.93	1706244.26	N 39 58 23.85	W 80 32 53.33	3.29
	3770.00	0.37	277.81	3767.41	2435.80	5.00	38.46	71.77	0.14	-0.13	-9.52	538328.09	1706243.57	N 39 58 23.88	W 80 32 53.34	3.29
	3864.00	0.39	320.00	3861.41	2529.80	5.47	38.74	71.27	0.29	0.02	44.88	538328.38	1706243.06	N 39 58 23.88	W 80 32 53.35	3.30
	3958.00	0.12	29.87	3955.41	2623.80	5.63	39.07	71.11	0.39	-0.29	74.33	538328.71	1706242.90	N 39 58 23.88	W 80 32 53.35	3.31
	4053.00	0.26	17.46	4050.41	2718.80	6.05	39.37	71.22	0.15	0.15	-13.06	538329.00	1706243.02	N 39 58 23.88	W 80 32 53.35	3.31
	4147.00	0.18	22.02	4144.40	2812.79	6.31	39.71	71.34	0.09	-0.09	4.85	538329.34	1706243.14	N 39 58 23.87	W 80 32 53.35	3.32
	4242.00	0.11	25.73	4239.40	2907.79	6.47	39.93	71.44	0.07	-0.07	3.91	538329.56	1706243.23	N 39 58 23.87	W 80 32 53.35	3.32
	4337.00	0.10	3.79	4334.40	3002.79	6.60	40.09	71.48	0.04	-0.01	-23.09	538329.73	1706243.28	N 39 58 23.87	W 80 32 53.35	3.32
	4431.00	0.99	145.52	4428.40	3096.79	5.88	39.51	71.94	1.13	0.94	150.78	538329.15	1706243.74	N 39 58 23.87	W 80 32 53.34	3.35
	4526.00	7.06	126.56	4523.12	3191.51	-0.04	35.36	77.10	6.46	6.40	-19.96	538325.00	1706248.80	N 39 58 23.83	W 80 32 53.27	3.48
	4573.00	9.47	107.76	4569.64	3238.03	-5.16	32.46	83.10	7.64	5.13	-40.00	538322.10	1706254.90	N 39 58 23.80	W 80 32 53.20	3.56
	4620.00	11.85	90.63	4615.84	3284.23	-9.88	31.22	91.61	8.38	5.06	-36.45	538320.86	1706263.41	N 39 58 23.79	W 80 32 53.09	3.64
	4667.00	14.50	68.20	4661.60	3320.99	-14.20	31.36	102.32	5.76	5.64	-5.17	538320.99	1706274.12	N 39 58 23.79	W 80 32 52.95	3.71
	4715.00	17.36	88.12	4707.75	3376.14	-19.31	31.78	115.49	5.96	5.96	-0.17	538321.42	1706287.26	N 39 58 23.79	W 80 32 52.78	3.78
	4762.00	19.99	81.91	4752.27	3420.66	-24.32	33.14	130.45	7.01	5.60	-13.21	538322.78	1706302.25	N 39 58 23.81	W 80 32 52.59	3.86
	4810.00	22.76	77.18	4796.97	3465.36	-28.57	36.36	147.64	6.79	5.77	-9.85	538325.99	1706319.43	N 39 58 23.84	W 80 32 52.37	3.93
	4857.00	25.12	71.40	4839.93	3508.32	-31.40	41.58	165.96	7.07	5.02	-12.30	538331.20	1706337.75	N 39 58 23.90	W 80 32 52.13	4.01
	4904.00	27.55	66.54	4882.06	3550.45	-32.77	49.07	185.39	6.91	5.17	-10.34	538338.71	1706357.18	N 39 58 23.97	W 80 32 51.88	4.08
	4951.00	29.50	59.55	4923.38	3591.75	-31.84	59.26	205.35	8.22	4.15	-14.87	538348.90	1706377.13	N 39 58 24.08	W 80 32 51.63	4.15
	4999.00	32.01	50.20	4964.61	3633.00	-28.62	72.33	226.11	6.33	5.23	-6.98	538361.97	1706397.90	N 39 58 24.21	W 80 32 51.37	4.21
	5094.00	37.25	57.90	5042.75	3711.14	-20.90	101.64	271.42	5.61	5.52	1.79	538391.27	1706443.21	N 39 58 24.50	W 80 32 50.79	4.33
	5188.00	41.23	48.48	5115.61	3784.00	-8.22	137.34	318.78	7.61	4.23	-10.02	538426.97	1706490.56	N 39 58 24.86	W 80 32 50.18	4.45
	5283.00	37.82	50.71	5188.88	3857.27	8.22	176.55	364.77	3.89	-3.59	2.35	538466.18	1706536.56	N 39 58 25.25	W 80 32 49.60	4.54
	5378.00	35.52	54.10	5265.08	3933.47	20.95	211.16	409.68	3.22	-2.42	3.57	538500.81	1706581.46	N 39 58 25.60	W 80 32 49.03	4.61
	5473.00	38.61	57.79	5340.88	4009.27	30.22	243.18	457.13	4.01	3.25	3.88	538532.80	1706628.91	N 39 58 25.92	W 80 32 48.42	4.68
	5567.00	42.86	56.29	5412.10	4080.49	39.10	276.57	508.57	4.64	4.52	-1.60	538566.19	1706680.34	N 39 58 26.26	W 80 32 47.77	4.75
	5662.00	44.36	55.67	5480.88	4149.27	49.76	313.23	562.87	1.64	1.58	-0.65	538602.86	1706734.65	N 39 58 26.63	W 80 32 47.08	4.80
	5757.00	39.57	53.18	5551.50	4219.89	61.71	350.12	614.55	5.34	-5.04	-2.62	538639.74	1706786.32	N 39 58 27.00	W 80 32 46.42	4.87
	5851.00	36.64	61.68	5625.51	4293.90	69.81	381.40	663.26	6.39	-3.12	9.04	538671.02	1706835.03	N 39 58 27.31	W 80 32 45.80	4.93
	5946.00	32.59	59.83	5703.68	4372.07	74.06	407.71	710.35	4.40	-4.26	-1.95	538697.34	1706882.12	N 39 58 27.58	W 80 32 45.20	4.98
	6040.00	33.24	62.72	5782.60	4450.99	77.66	432.25	755.14	1.81	0.69	3.07	538721.87	1706926.90	N 39 58 27.83	W 80 32 44.62	5.01
	6083.00	35.09	62.62	5818.18	4486.57	78.80	443.33	776.59	4.30	4.30	-0.23	538732.95	1706948.35	N 39 58 27.94	W 80 32 44.35	5.03
	6131.00	36.98	59.28	5856.99	4525.38	80.99	457.06	801.25	5.70	3.94	-7.00	538746.68	1706973.02	N 39 58 28.08	W 80 32 44.04	5.05
	6178.00	38.84	56.30	5894.08	4562.47	84.80	472.47	825.67	5.53	3.96	-6.30	538762.08	1706997.43	N 39 58 28.23	W 80 32 43.72	5.07
	6225.00	40.87	55.99	5930.16	4598.55	89.61	489.25	850.68	4.34	4.32	-0.66	538778.86	1707022.44	N 39 58 28.40	W 80 32 43.41	5.10
	6272.00	40.91	55.78	5965.69	4634.08	94.66	506.50	876.15	0.30	0.09	-0.45	538796.12	1707047.91	N 39 58 28.57	W 80 32 43.08	5.11
	6320.00	40.88	55.88	6001.98	4670.37	99.85	524.15	902.14	0.15	-0.10	0.17	538813.77	1707073.90	N 39 58 28.75	W 80 32 42.75	5.12
	6415.00	40.94	54.60	6073.78	4742.17	110.77	559.62	953.24	0.87	0.06	-1.33	538849.24	1707124.99	N 39 58 29.11	W 80 32 42.10	5.15
	6509.00	40.61	53.31	6144.97	4813.36	122.88	595.74	1002.87	0.96	-0.35	-1.37	538885.36	1707174.63	N 39 58 29.47	W 80 32 41.47	5.18
	6556.00	40.35	52.31	6180.72	4849.11	129.49	614.18	1027.18	1.49	-0.55	-2.13	538903.80	1707198.93	N 39 58 29.65	W 80 32 41.16	5.19
	6604.00	41.04	45.33	6217.13	4885.52	138.39	634.77	1050.69	9.59	1.44	-14.54	538924.39	1707222.45	N 39 58 29.86	W 80 32 40.86	5.22
	6651.00	42.05	37.69	6252.33	4920.72	150.98	658.09	1071.31	10.99	2.15	-16.26	538947.70	1707243.06	N 39 58 30.09	W 80 32 40.60	5.25
	6698.00	41.61	31.54	6287.37	4955.76	168.97	683.86	1089.10	8.77	-0.94	-13.09	538973.47	1707260.85	N 39 58 30.35	W 80 32 40.37	5.28
	6745.00	40.83	25.73	6322.73	4991.12	185.45	711.01	1103.94	8.31	-1.66	-12.36	539000.62	1707275.69	N 39 58 30.62	W 80 32 40.19	5.30
	6793.00	41.34	20.74	6358.92	5027.31	206.59	739.98	1116.37	6.91	1.06	-10.40	539029.59	1707288.12	N 39 58 30.91	W 80 32 40.03	5.32
	6840.00	43.45	16.49	6393.64	5062.03	229.67	770.00	1126.46	7.57	4.49	-9.04	539059.61	1707298.20	N 39 58 31.21	W 80 32 39.91	5.34
	6888.00	47.38	13.30	6427.33	5095.72	250.03	803.03	1135.21	9.42	8.15	-6.65	539092.63	1707306.95	N 39 58 31.53	W 80 32 39.80	5.37
	6935.00	51.16	8.07	6458.01	5126.40	284.91	837.95	1142.04	10.68	8.09	-9.21	539127.56	1707313.79	N 39 58 31.88	W 80 32 39.72	5.39
	6982.00	53.33	4.42	6486.79	5155.18	318.64	874.84	1146.35	8.94	4.62	-9.88	539164.45	1707318.10	N 39 58 32.24	W 80 32 39.67	5.41
	7029.00	55.90	0.00	6514.02	5182.41	350.81	913.12	1147.60	9.42	5.47	-9.40	539202.71	1707319.55	N 39 58 32.62	W 80 32 39.65	5.44
	7077.00	58.38	355.91	6540.07	5208.46	388.02	953.39	1146.34	8.83	5.17	-8.52	539242.99	1707318.09	N 39 58 33.02	W 80 32 39.68	5.46
	7124.00	60.04	352.20	6563.92	5232.31	426.37	993.68	1142.14	8.33	4.81	-7.89	539283.26	1707313.88	N 39 58 33.42	W 80 32 39.74	5.48
	7171.00	63.84	349.30	6585.81	5254.20	466.46	1034.70	1135.44	8.73	6.81	-6.17	539324.29	1707307.19	N 39 58 33.82	W 80 32 39.83	5.51
	7218.00	67.52	345.05	6605.17	5273.56	508.32	1076.48	1126.13	10.65	7.83	-7.77	539366.08	1707297.88	N 39 58 34.23	W 80 32 39.96	5.53
	7266.00	70.85	343.66	6622.23	5290.62	552.69	1119.73	1114.21	8.05	6.94	-4.38	539409.32	1707265.06	N 39 58 34.66	W 80 32 40.12	5.55
	7313.00	72.21	340.58	6637.12	5305.51	596.66	1162.13	1100.48	6.66	2.89	-6.32	539451.72	1707272.23	N 39 58 35.08	W 80 32 40.30	5.57
	7360.00	75.69	338.08	6650.11	5318.50	641.91	1204.38	1084.54	9.00	7.40	-5.32	539493.97	1707256.29	N 39 58 35.49	W 80 32 40.51	5.60
	7407.00	78.62	334.31	6660.56	5328.95	687.71	1246.29	1066.04	10.00	6.23	-8.02	539535.88	1707237.79	N 39 58 35.91	W 80 32 40.75	5.62
	7455.00	80.89	330.50	6669.10	5337.49	734.87	1288.14	1044.18	9.13	4.73	-7.94	539577.72	1707215.91	N 39 58 36.32	W 80 32 41.04	5.64
	7502.00	83.01	326.65	6675.69	5344.08	781.07	1327.84	1019.90	9.28	4.51	-8.19	539617.42	1707191.65	N 39 58 36.71	W 80 32 41.36	5.66

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Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	TVDSS (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	BR (°/100ft)	TR (°/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ' ")	Longitude (E/W ° ' ")	Directional Difficulty Index
	7550.00	87.04	325.26	6679.85	5348.24	828.24	1367.45	993.13	8.88	8.40	-2.90	539657.03	1707164.68	N 39 58 37.09	W 80 32 41.71	5.68
	7597.00	89.79	325.79	6681.15	5349.54	874.53	1406.18	966.54	5.96	5.85	1.13	539695.76	1707138.29	N 39 58 37.47	W 80 32 42.05	5.70
	7715.00	89.89	326.34	6681.48	5349.87	990.99	1504.08	900.67	0.47	0.08	0.47	539793.65	1707072.42	N 39 58 38.43	W 80 32 42.92	5.73
	7810.00	89.60	327.55	6681.90	5350.29	1084.97	1583.70	848.85	1.31	-0.31	1.27	539873.27	1707020.61	N 39 58 39.21	W 80 32 43.59	5.76
	7904.00	89.54	327.45	6682.61	5351.00	1178.09	1662.98	798.35	0.12	-0.06	-0.11	539952.54	1706970.11	N 39 58 39.99	W 80 32 44.25	5.78
	7999.00	89.51	326.21	6683.39	5351.78	1272.04	1742.49	746.37	1.31	-0.03	-1.31	540032.05	1706918.14	N 39 58 40.77	W 80 32 44.93	5.81
	8094.00	89.48	324.65	6684.23	5352.62	1365.62	1820.71	692.47	1.64	-0.03	-1.64	540110.27	1706884.24	N 39 58 41.54	W 80 32 45.64	5.83
	8189.00	89.94	322.94	6684.71	5353.10	1458.69	1897.38	636.38	1.86	0.48	-1.80	540186.92	1706808.13	N 39 58 42.29	W 80 32 46.37	5.86
	8283.00	89.94	322.14	6684.81	5353.20	1550.38	1971.98	579.19	0.85	0.00	-0.85	540261.53	1706750.96	N 39 58 43.02	W 80 32 47.11	5.88
	8378.00	89.97	321.49	6684.89	5353.28	1642.73	2046.65	520.46	0.68	0.03	-0.68	540336.20	1706692.23	N 39 58 43.75	W 80 32 47.88	5.90
	8472.00	90.06	322.04	6684.86	5353.25	1734.10	2120.48	462.28	0.59	0.10	0.59	540410.03	1706634.06	N 39 58 44.47	W 80 32 48.64	5.92
	8567.00	90.06	324.10	6684.76	5353.15	1826.93	2196.42	405.21	2.17	0.00	2.17	540485.96	1706576.99	N 39 58 45.22	W 80 32 49.38	5.94
	8662.00	89.54	326.14	6685.00	5353.48	1920.42	2274.35	350.88	2.22	-0.55	2.15	540563.89	1706522.67	N 39 58 45.98	W 80 32 50.09	5.96
	8756.00	89.48	325.84	6685.90	5354.29	2013.17	2352.27	298.31	0.33	-0.06	-0.32	540641.80	1706470.09	N 39 58 46.75	W 80 32 50.78	5.98
	8851.00	89.46	325.80	6686.78	5355.17	2106.85	2430.85	244.94	0.05	-0.02	-0.04	540720.39	1706416.73	N 39 58 47.52	W 80 32 51.48	6.00
	8945.00	89.43	326.06	6687.69	5356.08	2199.59	2508.72	192.28	0.28	-0.03	0.28	540798.25	1706364.07	N 39 58 48.28	W 80 32 52.16	6.02
	9040.00	89.60	325.89	6688.33	5356.72	2293.32	2587.45	139.13	0.43	0.39	-0.18	540876.98	1706310.92	N 39 58 49.05	W 80 32 52.86	6.03
	9134.00	90.54	326.33	6688.05	5356.44	2386.10	2665.48	86.71	0.92	0.79	0.47	540955.00	1706258.51	N 39 58 49.82	W 80 32 53.54	6.05
	9229.00	90.46	326.09	6687.22	5355.61	2479.90	2744.43	33.88	0.27	-0.08	-0.25	541033.95	1706205.68	N 39 58 50.59	W 80 32 54.23	6.07
	9324.00	90.49	326.35	6686.43	5354.82	2573.69	2823.39	-18.94	0.28	0.03	0.27	541112.90	1706152.86	N 39 58 51.36	W 80 32 54.92	6.08
	9419.00	90.40	326.24	6685.69	5354.08	2667.51	2902.42	-71.65	0.15	-0.09	-0.12	541191.93	1706100.15	N 39 58 52.14	W 80 32 55.61	6.10
	9513.00	90.46	325.70	6684.99	5353.38	2760.25	2980.32	-124.26	0.58	0.06	-0.57	541269.83	1706047.55	N 39 58 52.90	W 80 32 56.30	6.11
	9608.00	90.49	325.83	6684.20	5352.59	2853.93	3058.85	-177.70	0.14	0.03	0.14	541348.36	1705994.10	N 39 58 53.67	W 80 32 57.00	6.13
	9702.00	90.49	326.64	6683.39	5351.78	2946.74	3136.99	-229.94	0.86	0.00	0.86	541426.50	1705941.87	N 39 58 54.44	W 80 32 57.68	6.14
	9797.00	90.46	326.15	6682.61	5351.00	3040.58	3216.11	-282.52	0.52	-0.03	-0.52	541505.61	1705889.29	N 39 58 55.22	W 80 32 58.37	6.16
	9891.00	90.49	325.09	6681.83	5350.22	3133.23	3293.69	-335.60	1.13	0.03	-1.13	541583.19	1705836.22	N 39 58 55.98	W 80 32 59.00	6.17
	9986.00	90.49	324.79	6681.02	5349.41	3226.67	3371.45	-390.18	0.32	0.00	-0.32	541660.94	1705781.65	N 39 58 56.74	W 80 32 59.78	6.19
	10081.00	90.40	323.17	6680.28	5348.67	3319.80	3448.28	-446.03	1.71	-0.09	-1.71	541737.77	1705725.79	N 39 58 57.49	W 80 33 0.50	6.20
	10175.00	90.54	323.06	6679.51	5347.90	3411.67	3523.46	-502.45	0.19	0.15	-0.12	541812.95	1705669.37	N 39 58 58.23	W 80 33 1.24	6.22
	10270.00	90.49	322.84	6678.65	5347.04	3504.46	3599.28	-559.68	0.24	-0.05	-0.23	541888.77	1705612.14	N 39 58 58.97	W 80 33 1.99	6.23
	10365.00	90.49	322.65	6677.84	5346.23	3597.17	3674.80	-617.19	0.20	0.00	-0.20	541964.37	1705554.63	N 39 58 59.71	W 80 33 2.74	6.24
	10460.00	90.54	322.41	6676.99	5345.38	3689.80	3750.29	-674.98	0.26	0.05	-0.25	542039.77	1705496.85	N 39 59 0.45	W 80 33 3.48	6.26
	10554.00	90.46	322.39	6676.17	5344.56	3781.41	3824.76	-732.33	0.09	-0.09	-0.02	542114.24	1705439.50	N 39 59 1.18	W 80 33 4.24	6.27
	10649.00	90.46	321.98	6675.40	5343.79	3873.92	3899.81	-790.58	0.43	0.00	-0.43	542189.28	1705381.26	N 39 59 1.91	W 80 33 5.00	6.28
	10743.00	90.09	324.30	6674.95	5343.34	3965.79	3975.01	-846.96	2.50	-0.39	2.47	542264.48	1705324.88	N 39 59 2.65	W 80 33 5.73	6.30
	10838.00	90.00	324.00	6674.88	5343.27	4058.99	4052.01	-902.60	0.33	-0.09	-0.32	542341.48	1705269.24	N 39 59 3.40	W 80 33 6.40	6.31
	10933.00	89.46	324.33	6675.33	5343.72	4152.18	4129.03	-958.21	0.67	-0.57	0.35	542418.49	1705213.63	N 39 59 4.16	W 80 33 7.19	6.32
	11027.00	89.51	324.93	6676.17	5344.56	4244.54	4205.68	-1012.62	0.64	0.05	0.64	542495.14	1705159.22	N 39 59 4.91	W 80 33 7.90	6.33
	11122.00	90.06	326.64	6676.53	5344.92	4338.22	4284.23	-1066.04	1.89	0.58	1.80	542573.69	1705105.80	N 39 59 5.68	W 80 33 8.59	6.35
	11217.00	89.97	326.42	6676.50	5344.89	4432.10	4363.48	-1118.43	0.25	-0.09	-0.23	542652.93	1705053.41	N 39 59 6.46	W 80 33 9.28	6.36
	11311.00	90.11	327.22	6676.44	5344.83	4525.07	4442.15	-1169.87	0.88	0.15	0.85	542731.60	1705001.97	N 39 59 7.23	W 80 33 9.95	6.37
	11406.00	89.91	327.12	6676.42	5344.81	4619.10	4521.98	-1221.38	0.24	-0.21	-0.11	542811.42	1704950.47	N 39 59 8.01	W 80 33 10.63	6.38
	11501.00	89.97	327.08	6676.52	5344.91	4713.12	4601.74	-1272.93	0.09	0.06	-0.04	542891.18	1704898.87	N 39 59 8.79	W 80 33 11.30	6.39
	11595.00	90.54	326.59	6676.10	5344.49	4806.09	4680.43	-1324.40	0.60	0.61	-0.52	542969.87	1704847.45	N 39 59 9.56	W 80 33 11.97	6.41
	11690.00	90.37	325.19	6675.35	5343.74	4899.60	4759.08	-1377.67	1.48	-0.18	-1.47	543048.51	1704794.18	N 39 59 10.34	W 80 33 12.67	6.42
	11785.00	90.43	324.98	6674.68	5343.07	4993.28	4836.98	-1432.05	0.23	0.06	-0.22	543126.41	1704739.81	N 39 59 11.10	W 80 33 13.38	6.43
	11879.00	90.51	324.76	6673.91	5342.30	5085.71	4913.65	-1486.13	0.25	0.09	-0.23	543203.28	1704685.73	N 39 59 11.85	W 80 33 14.09	6.44
	11973.00	90.52	324.89	6673.07	5341.46	5178.13	4990.69	-1540.28	0.14	0.01	0.14	543280.11	1704631.58	N 39 59 12.61	W 80 33 14.79	6.45
	12068.00	90.49	324.65	6672.23	5340.62	5271.52	5068.28	-1595.08	0.25	-0.03	-0.25	543357.70	1704576.78	N 39 59 13.37	W 80 33 15.51	6.46
	12163.00	90.52	325.14	6671.39	5339.78	5364.94	5146.00	-1649.71	0.52	0.03	0.52	543435.42	1704522.15	N 39 59 14.13	W 80 33 16.22	6.47
	12257.00	90.46	325.19	6670.59	5338.98	5457.46	5223.15	-1703.41	0.08	-0.06	0.05	543512.57	1704468.46	N 39 59 14.88	W 80 33 16.92	6.48
	12351.00	90.49	324.64	6669.81	5338.20	5549.91	5300.07	-1757.43	0.59	0.03	-0.59	543589.48	1704414.44	N 39 59 15.64	W 80 33 17.63	6.49
	12446.00	90.46	325.10	6669.02	5337.41	5643.32	5377.76	-1812.10	0.49	-0.03	0.48	543667.17	1704359.78	N 39 59 16.40	W 80 33 18.34	6.50
	12541.00	90.49	325.27	6668.23	5336.62	5736.83	5455.75	-1866.33	0.18	0.03	0.18	543745.16	1704305.54	N 39 59 17.16	W 80 33 19.05	6.51
	12635.00	89.37	324.99	6668.35	5336.74	5829.34	5532.87	-1920.07	1.23	-1.19	-0.30	543822.28	1704251.80	N 39 59 17.92	W 80 33 19.75	6.52
	12730.00	89.43	324.62	6669.34	5337.73	5922.74	5610.50	-1974.83	0.39	0.06	-0.39	543899.90	1704197.06	N 39 59 18.68	W 80 33 20.47	6.53
	12824.00	89.34	324.46	6670.35	5338.74	6015.07	5687.06	-2029.36	0.20	-0.10	-0.17	543976.46	1704142.53	N 39 59 19.43	W 80 33 21.18	6.54
	12919.00	89.34	324.87	6671.45	5339.84	6108.44	5764.61	-2084.23	0.54	0.00	0.54	544054.00	1704087.68	N 39 59 20.19	W 80 33 21.90	6.55
	13013.00	90.51	324.66	6671.57	5339.96	6200.85	5841.43	-2138.39	1.29	1.24	-0.33	544130.82	1704033.50	N 39 59 20.94	W 80 33 22.60	6.56
	13108.00	90.49	324.79	6670.74	5339.13	6294.23	5918.98	-2193.25	0.14	-0.02	0.14	544208.37	1703978.64	N 39 59 21.70	W 80 33 23.32	6.57
	13203.00	90.49	324.90	6669.93	5338.32	6387.63	5996.65	-2247.95	0.12	0.00	0.12	544286.04	1703923.94	N 39 59 22.46	W 80 33 24.04	6.58
	13297.00	90.40	325.05	6669.20	5337.59	6480.10	6073.63	-2301.90	0.19	-0.10	0.16	544363.01	1703870.00	N 39 59 23.22	W 80 33 24.74	6.59
	13392.00	90.46	325.15	6668.49	5336.88	6573.59	6151.54	-2356.25	0.12	0.08	0.11	544440.91	1703815.65	N 39 59 23.98	W 80 33 25.45	6.59

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Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	TVDSS (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	BR (°/100ft)	TR (°/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ' ")	Longitude (E/W ° ' ")	Directional Difficulty Index
	13487.00	90.43	324.73	6667.75	5336.14	6667.02	6220.30	-2410.82	0.44	-0.03	-0.44	544518.67	1703761.08	N 39 59 24.74	W 80 33 26.16	6.60
	13581.00	90.37	324.86	6667.09	5335.48	6759.43	6306.10	-2405.01	0.15	-0.06	0.14	544595.47	1703708.89	N 39 59 25.50	W 80 33 26.87	6.61
	13676.00	90.60	325.22	6666.29	5334.68	6852.90	6383.96	-2519.44	0.45	0.24	0.38	544673.32	1703652.40	N 39 59 26.26	W 80 33 27.58	6.62
	13771.00	90.54	326.10	6665.34	5333.73	6946.64	6462.40	-2573.03	0.93	-0.06	0.93	544751.76	1703598.68	N 39 59 27.03	W 80 33 28.28	6.63
	13865.00	90.49	325.48	6664.50	5332.89	7039.24	6540.12	-2625.89	0.68	-0.05	-0.68	544829.48	1703546.02	N 39 59 27.79	W 80 33 28.97	6.64
	13960.00	90.40	325.03	6663.76	5332.15	7132.77	6618.10	-2680.01	0.41	-0.09	-0.40	544907.55	1703491.90	N 39 59 28.56	W 80 33 29.68	6.65
	14055.00	90.37	325.09	6663.12	5331.51	7226.25	6696.09	-2734.38	0.03	-0.03	0.01	544985.44	1703437.53	N 39 59 29.32	W 80 33 30.39	6.66
	14149.00	90.46	324.84	6662.44	5330.83	7318.72	6773.06	-2788.35	0.28	0.10	-0.27	545062.41	1703383.57	N 39 59 30.07	W 80 33 31.10	6.66
	14244.00	90.43	325.23	6661.70	5330.09	7412.18	6850.91	-2842.79	0.41	-0.03	0.41	545140.25	1703329.13	N 39 59 30.84	W 80 33 31.81	6.67
	14339.00	90.51	325.13	6660.92	5329.31	7505.69	6928.89	-2897.03	0.13	0.08	-0.11	545218.24	1703274.89	N 39 59 31.60	W 80 33 32.52	6.68
	14433.00	90.00	325.16	6660.40	5328.85	7598.21	7006.03	-2950.75	0.48	-0.48	0.03	545295.37	1703221.17	N 39 59 32.36	W 80 33 33.22	6.69
	14528.00	89.88	324.94	6660.52	5328.91	7691.69	7083.00	-3005.17	0.31	-0.21	-0.23	545373.23	1703166.75	N 39 59 33.12	W 80 33 33.93	6.70
	14623.00	89.97	324.78	6660.66	5329.05	7785.10	7161.58	-3059.85	0.20	0.12	-0.17	545450.91	1703112.08	N 39 59 33.88	W 80 33 34.64	6.70
	14717.00	89.86	324.91	6660.80	5329.19	7877.52	7238.44	-3113.98	0.18	-0.12	0.14	545527.77	1703057.96	N 39 59 34.63	W 80 33 35.35	6.71
	14812.00	89.77	324.67	6661.11	5329.50	7970.02	7316.06	-3168.75	0.27	-0.09	-0.25	545605.38	1703003.18	N 39 59 35.40	W 80 33 36.06	6.72
	14907.00	89.91	325.31	6661.37	5329.76	8064.37	7393.86	-3223.25	0.69	0.15	0.67	545683.19	1702948.68	N 39 59 36.16	W 80 33 36.78	6.73
	15001.00	90.26	325.03	6661.23	5329.62	8156.90	7471.02	-3276.94	0.48	0.37	-0.30	545760.34	1702895.00	N 39 59 36.91	W 80 33 37.48	6.74
	15096.00	90.37	325.03	6660.71	5329.10	8250.37	7548.87	-3331.39	0.12	0.12	0.00	545838.19	1702840.55	N 39 59 37.68	W 80 33 38.19	6.74
	15190.00	90.34	325.04	6660.13	5328.52	8342.85	7625.90	-3385.26	0.03	-0.03	0.01	545915.21	1702786.69	N 39 59 38.43	W 80 33 38.89	6.75
	15285.00	90.43	324.93	6659.49	5327.88	8436.30	7703.71	-3439.76	0.15	0.09	-0.12	545993.01	1702732.18	N 39 59 39.19	W 80 33 39.61	6.76
	15380.00	90.49	325.54	6658.73	5327.12	8529.82	7781.75	-3493.93	0.65	0.06	0.64	546071.05	1702678.01	N 39 59 39.96	W 80 33 40.31	6.76
	15475.00	90.29	325.39	6658.08	5326.47	8623.42	7860.00	-3547.79	0.26	-0.21	-0.16	546149.30	1702624.16	N 39 59 40.73	W 80 33 41.02	6.77
	15569.00	90.20	325.23	6657.68	5326.07	8716.93	7937.29	-3601.29	0.20	-0.10	-0.17	546226.59	1702570.67	N 39 59 41.48	W 80 33 41.72	6.78
	15663.00	90.29	325.13	6657.28	5325.67	8808.51	8014.46	-3654.96	0.14	0.10	-0.11	546303.76	1702518.99	N 39 59 42.24	W 80 33 42.42	6.79
Final Survey	15713.00	90.40	325.55	6656.98	5325.37	8857.75	8055.59	-3683.39	0.87	0.22	0.84	546344.88	1702488.56	N 39 59 42.64	W 80 33 42.79	6.79
Projection to TD	15748.00	90.40	325.55	6656.73	5325.12	8892.24	8084.45	-3703.19	0.00	0.00	0.00	546373.74	1702468.76	N 39 59 42.93	W 80 33 43.05	6.79

51-01660

Survey Type: Def Survey

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

Survey Program:

Description	Part	MD From (ft)	MD To (ft)	EOU Freq (ft)	Hole Size (in)	Casing Diameter (in)	Survey Tool Type	Borehole / Survey
	1	0.000	22.430	Act Stns	30.000	30.000	SLB_NSG+MSHOT-Depth Only	Original Borehole / Noble Energy SHL-26C-HS Surveys 0ft to 15748ft MD
	1	22.430	1178.000	Act Stns	30.000	30.000	SLB_NSG+MSHOT	Original Borehole / Noble Energy SHL-26C-HS Surveys 0ft to
	1	1178.000	15713.000	Act Stns	30.000	30.000	SLB_MWD-STD	Original Borehole / Noble Energy SHL-26C-HS Surveys 0ft to
	1	15713.000	15748.000	Act Stns	30.000	30.000	SLB_BLIND+TREND	Original Borehole / Noble Energy SHL-26C-HS Surveys 0ft to

51-01660

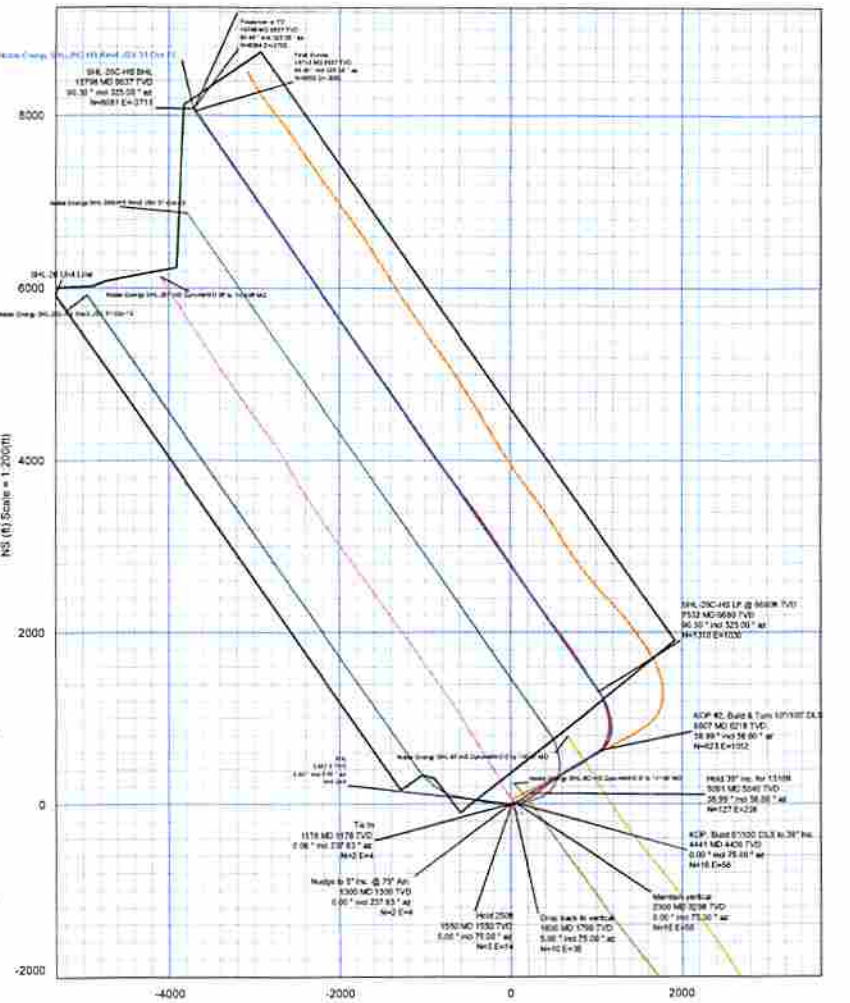
noble energy

Noble Energy

PATHFINDER
A Schlumberger Company

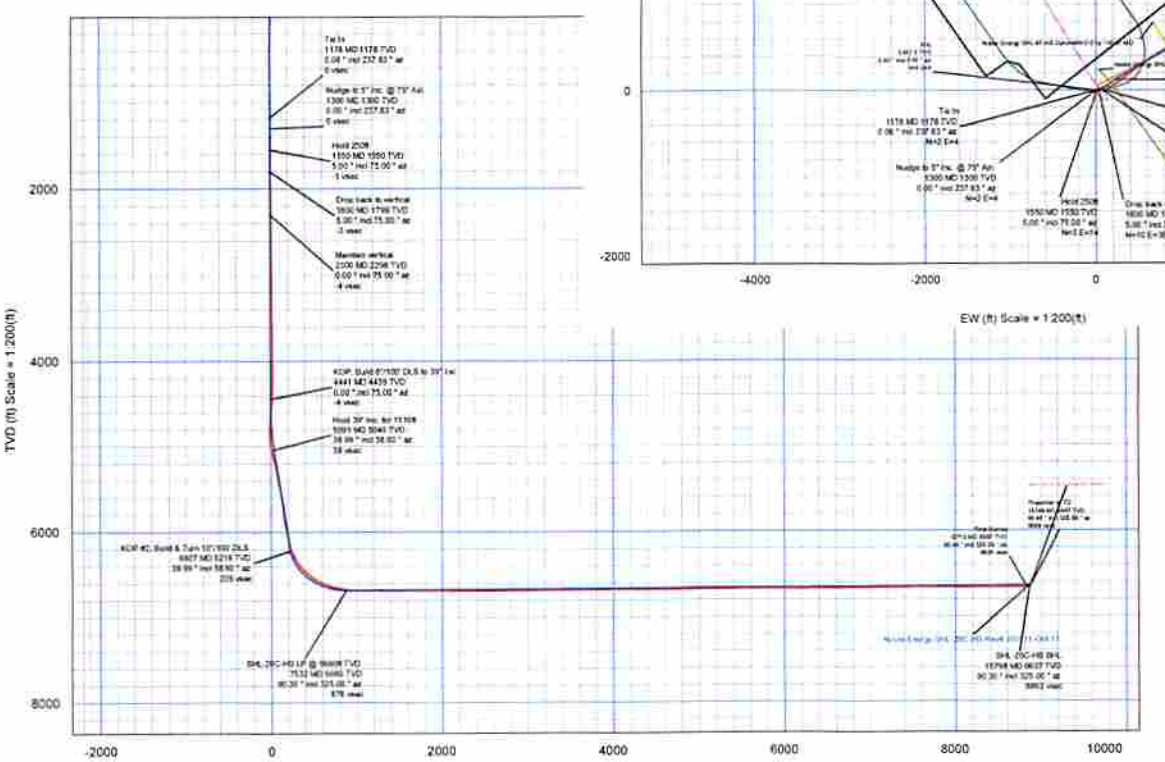
Borehole:	Well:	Field:	Structure:
Original Borehole	SHL-26C-HS	WV Marshall County (NAD 27)	Nabors M59

Gravity & Magnetic Parameters															
Model:	HDGM 2013	Dip:	67.511°	Date:	12/19/2013	Surface Location	NAD27 West Virginia State Plane, Northern Zone, US Feet					Miscellaneous			
MagDec:	-8.414°	FS:	51128.106nT	Gravity FS:	999.345mgn (9.80665 Based)	Lat:	N 39 58 23.47	Northing:	538289.639ftUS	Grid Conv:	-0.669°	Slot:	SHL-26C-HS	TVD Ref:	KB(1331.61ft above MSL)
						Lon:	W 80 32 54.26	Easting:	1704171.797ftUS	Scale Fact:	1	Plan:	MWD Surveys		

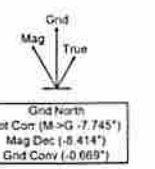


Surface Location															
Northing:	538289.639	Easting:	1704171.797	Latitude:	N 39 58 23.47	Longitude:	W 80 32 54.26	Allow Azimuth:	339.997						
Target Description				Grid Coords								Local Coord			
Target Name	Shape	Dimension		Latitude	Longitude	Northing	Easting	TVD	Vsec			N+/-S	E+/-W		
SHL-26C-HS BHL	Point	N/A		N 39 58 23.47	W 80 32 54.26	538289.639	1704171.797	6637.61	6637.61			0.00	0.00		
SHL-26C-HS LP	Point	N/A		N 39 58 35.53	W 80 32 41.32	538689.46	1705000.05	6701.61	7531.14			399.82	1000.00		
SHL-26C-HS BHL	Point	N/A		N 39 58 43.84	W 80 32 42.79	538879.33	1705047.58	6707.61	8681.33			589.33	1047.58		

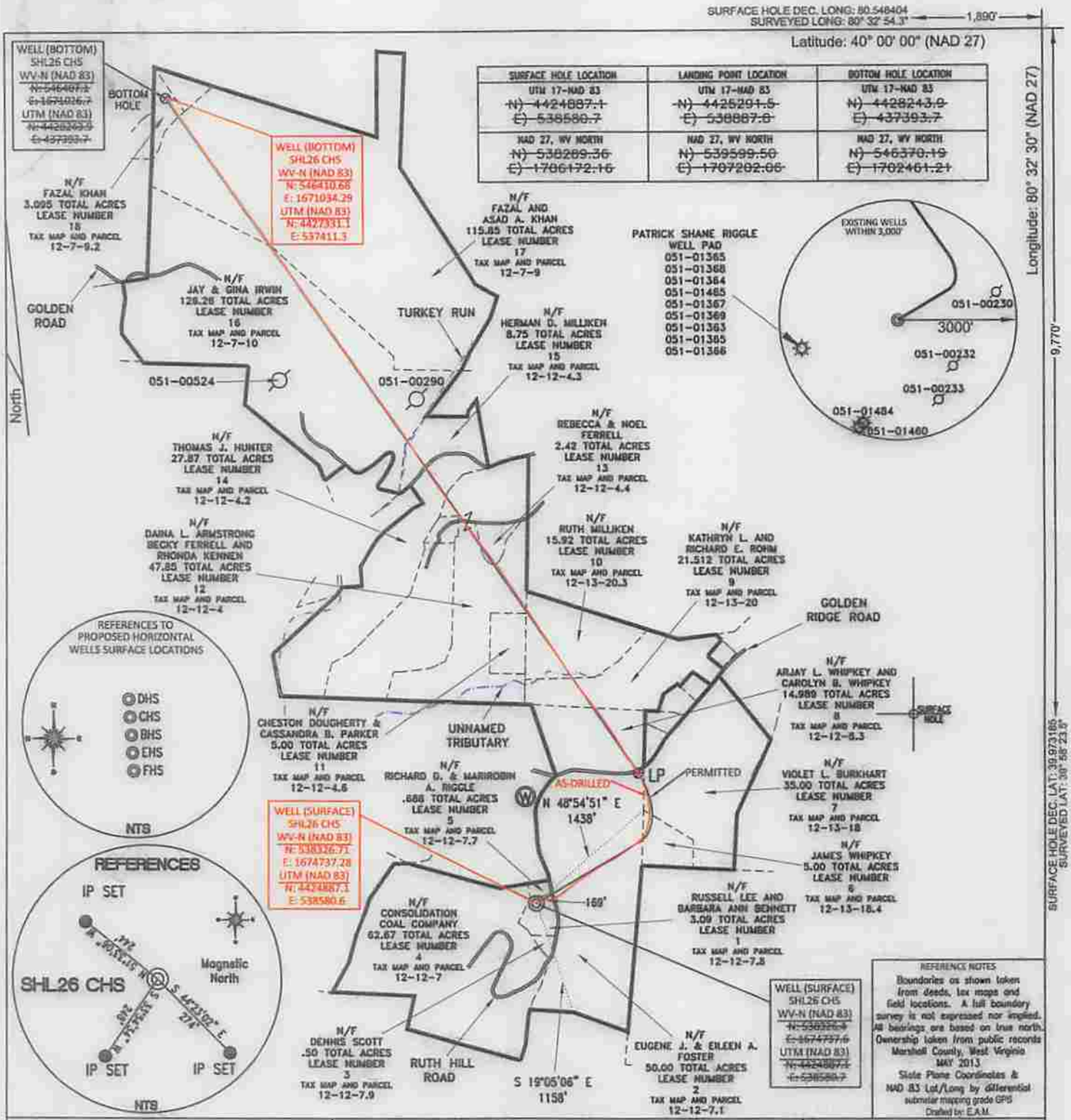
Critical Points								
	MD	INCL	AZIM	TVD	VSEC	N+/-S	E+/-W	DLS
SHL	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Tie Survey	1177.00	0.06	232.63	1176.99	0.00	0.00	0.00	0.01
Projection to TD	8700.00	90.00	325.00	6637.61	6637.61	3882.00	-2713.00	0.00



Vertical Section (ft) Azim = 339.997° Scale = 1:200(ft) Origin = 0N/-S, 0E/-W



Grid North
Tot Corr (M->G -7.745°)
Mag Dec (-8.414°)
Grid Conv (-0.669°)



SURFACE HOLE LOCATION	LANDING POINT LOCATION	BOTTOM HOLE LOCATION
UTM 17-NAD 83	UTM 17-NAD 83	UTM 17-NAD 83
~~N) 4424887.1~~	~~N) 4425291.5~~	~~N) 4428243.9~~
~~E) 538580.7~~	~~E) 538887.8~~	~~E) 437393.7~~
NAD 27, WV NORTH	NAD 27, WV NORTH	NAD 27, WV NORTH
~~N) 538289.36~~	~~N) 539599.50~~	~~N) 546370.19~~
~~E) 1706172.16~~	~~E) 1707292.06~~	~~E) 1702461.21~~

FILE #: NOB 002

DRAWING #: 2218

SCALE: PLAT - 1" = 1400' TICK MARK - 1" = 2000'

MINIMUM DEGREE OF ACCURACY: 1/200

PROVEN SOURCE OF ELEVATION: SUBMETER MAPPING GRADE GPS

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 DEPARTMENT OF ENVIRONMENTAL PROTECTION.

Signed:

L.L.S. #2124 : Ernest J. Benchek III

ERNEST J. BENCHEK III
LICENSED
No. 2124
STATE OF WEST VIRGINIA
PROFESSIONAL SURVEYOR

(+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS

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

DATE: AUGUST 8, 2014

OPERATOR'S WELL #: SHL26 CHS AS-DRILLED

API WELL #: 47 (STATE) 51 (COUNTY) 01660 (PERMIT)

Well Type: ☐ Oil ☐ Waste Diposal ☒ Production ☐ Deep
☒ Gas ☐ Liquid Injection ☐ Storage ☒ Shallow

WATERSHED: WHEELING CREEK

ELEVATION: 1,320'

COUNTY/DISTRICT: MARSHALL / SANDHILL

QUADRANGLE: MAJORSVILLE WV-PA

SURFACE OWNER: RUSSELL LEE AND BARBARA ANN BENNETT

ACREAGE: 3.09 +/-

OIL & GAS ROYALTY OWNER: JAMES O. WHIPKEY ET AL

ACREAGE: 477.606 +/-

LEASE NUMBERS:

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

TARGET FORMATION: MARCELLUS

ESTIMATED DEPTH: TVD: 6,698' TMD: 15,844'

WELL OPERATOR: NOBLE ENERGY, INC.

DESIGNATED AGENT: STEVEN M. GREEN

ADDRESS: 333 TECHNOLOGY DRIVE SUITE 116

ADDRESS: 500 VIRGINIA STREET EAST

CITY: CANONSBURG STATE: PA ZIP CODE: 15317

CITY: CHARLESTON STATE: WV ZIP CODE: 25301

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pm

Page ___ of ___

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

API 47- 051 - 01661 County Marshall District Sandhill
Quad Majorsville Pad Name SHL-26 Field/Pool Name
Farm name Russell Lee and Barbara Ann Bennett Well Number SHL26DHS
Operator (as registered with the OOG) Noble Energy Inc.
Address 333 Technology Drive, Suite 116 City Canonsburg State PA Zip 15317

As Drilled location NAD 83/UTM Attach an as-drilled plat, profile view, and deviation survey

Top hole	Northing	4424891.684611	Easting	538580.197224
Landing Point of Curve	Northing	538580.197224	Easting	539048.424375
Bottom Hole	Northing	4427463.655124	Easting	537598.009712

Elevation (ft) 1310.00 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)
Synthetic Oil Based

Date permit issued 08/19/2013 Date drilling commenced 10/8/2013 Date drilling ceased 12/9/2013
Date completion activities began 03/16/2014 Date completion activities ceased 5/27/2014
Verbal plugging (Y/N) N Date permission granted _____ Granted by _____

RECEIVED
Office of Oil and Gas
SEP 11 2014
WV Department of
Environmental Protection

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

Freshwater depth(s) ft 198', 300' Open mine(s) (Y/N) depths N
Salt water depth(s) ft N/A Void(s) encountered (Y/N) depths N
Coal depth(s) ft 761' to 771' Pittsburgh Cavern(s) encountered (Y/N) depths N
Is coal being mined in area (Y/N) Y

Reviewed by:

WR-35
Rev. 8/23/13

API 47- 051 - 01661 Farm name Russell Lee and Barbara Ann Bennett Well number SHL26DHS

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	36	30	40	N	K-55 94#		
Surface	24	20	414.9	N	J-55 94#		Y
Coal	17 1/2	13 3/8	1217.9	N	J-55 54.5#		Y
Intermediate 1	12 3/8	9 5/8	3234.8	N	J-55 36#		Y
Intermediate 2							
Intermediate 3							
Production	8 3/4	5 1/2	16108	N	P-110 20#		Y
Tubing							
Packer type and depth set							

Comment Details 2 Baskets on Surface Casing

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	Type 1	487	15.6	1.18	103	0	8
Coal	Type 1	1027	15.6	1.2	220	0	8
Intermediate 1	Type 1	1265	15.6	1.2	301	0	12+
Intermediate 2							
Intermediate 3							
Production	Class A	2820	14.8	1.25	628	916	8
Tubing							

Drillers TD (ft) 16,108 Loggers TD (ft) 16073
Deepest formation penetrated Marcellus Plug back to (ft) not a pilot Hole
Plug back procedure not a pilot Hole

Kick off depth (ft) 7976

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
4 Centralizers on Surface casing, 10 Centralizers on Coal casing. 40 Centralizers on Intermediate casing. 253 Centralizers on Production casing.
On the Surface, Coal, and Intermediate Strings, the centralizers are on every 3 joint of casing.
On the Production String, they are on every 3rd from Surface to Top of Curve, then every joint until TD.

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

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Rev. 8/23/13

API 47- 051 - 01661 Farm name Russell Lee and Barbara Ann Bennett Well number SHL26DHS

PERFORATION RECORD

Stage No.	Perforation date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formation(s)

PLEASE SEE ATTACHED PERFORATION RECORD

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 (bbls)	Amount of Nitrogen/other (units)

PLEASE SEE ATTACHED STIMULATION INFORMATION PER STAGE SHEET

Please insert additional pages as applicable.

PERFORATION RECORD

API: 47-051-01661 Farm name: Russell Lee and Barbara Ann Bennett Well Name: SHL-26D-HS

Stage No.	Stim Date	Top Perf	Bottom Perf	# of Perfs	Formation
TOE SLEEVE	3/7/2014	15976	15978		Marcellus
1	3/17/2014	15724	15948	48	Marcellus
2	3/17/2014	15423	15677	40	Marcellus
3	3/18/2014	15123	15377	40	Marcellus
4	3/19/2014	14823	15077	40	Marcellus
5	3/20/2014	14523	14777	40	Marcellus
6	3/20/2014	14223	14477	40	Marcellus
7	3/21/2014	13923	14177	40	Marcellus
8	3/22/2014	13623	13877	40	Marcellus
9	3/23/2014	13323	13577	40	Marcellus
10	3/23/2014	13023	13277	40	Marcellus
11	3/24/2014	12723	12977	40	Marcellus
12	3/24/2014	12423	12677	40	Marcellus
12 REPERF	3/25/2014	12413	12467	24	Marcellus
13	3/26/2014	12123	12377	40	Marcellus
13 REPERF	3/27/2014	12111	12202	32	Marcellus
14	3/27/2014	11823	12077	40	Marcellus
15	3/28/2014	11523	11777	40	Marcellus
16	3/29/2014	11223	11477	40	Marcellus
17	3/29/2014	10975	11177	40	Marcellus
18	3/30/2014	10673	10927	40	Marcellus
19	3/30/2014	10373	10627	40	Marcellus
19 REPERF	3/31/2014	10355	10416	24	Marcellus
20	3/31/2014	10073	10327	40	Marcellus
21	4/1/2014	9773	10027	40	Marcellus
22	4/1/2014	9711	9729	16	Marcellus
22 2ND RUN	4/2/2014	9473	9664	32	Marcellus
23	4/2/2014	9170.5	9427	40	Marcellus
24	4/3/2014	8925	9127	40	Marcellus
25	4/3/2014	8623	8877	40	Marcellus
26	4/4/2014	8323	8577	40	Marcellus
27	4/5/2014	8023	8277	40	Marcellus
28	4/5/2014	7723	7977	40	Marcellus

STIMULATION INFORMATIOIN PER STAGE

API: 47-051-01661 Farm name: Russell Lee and Barbara Ann Bennett Well Name: SHL-26D-HS

Stage No.	Stim Date	Avg Rate (bpm)	ATP (psi)	Max BD Pressure	ISIP (psi)	Proppant (lbs)	Water (BBLS)	Amount of N^2/ other
1 Inj Test	3/17/2014		7427		6070	0	514.00	
1.1	3/17/2014	86.0	8548	5467		169,058	6600.60	
1.2	3/17/2014	86.4	8538	5467		165,687	5990.05	
1.3	3/18/2014	88.4	8491	5400	3665	164,798	4912.12	
2.1	3/18/2014	82.7	8254	6024		167,673	6766.53	
2.2	3/18/2014	86.1	8385	5319		168,349	5889.24	
2.3	3/19/2014	88.1	8590	5233	4164	167,441	5638.43	
3.1	3/19/2014	87.6	8267	5609		202,095	7071.14	
3.2	3/19/2014	88.2	8065	5315		198,908	5954.45	
3.3	3/19/2014	88.1	8869	5217	3942	197,386	5251.31	
4.1	3/20/2014	87.4	8275	5870		198,965	6998.61	
4.2	3/20/2014	87.9	8266	5714		199,935	5621.69	
4.3	3/20/2014	90.7	8316	5727	3997	201,591	5300.26	
5.1	3/20/2014	88.7	8253	6036		201,402	6366.37	
5.2	3/20/2014	86.8	7918	5172		204,360	6888.81	
5.3	3/20/2014	86.4	8002	5310	3999	204,595	6416.95	
6.1	3/21/2014	81.5	9068	5994		167,198	7134.94	
6.2	3/21/2014	83.6	8270	6338		168,225	5201.40	
6.3	3/21/2014	87.9	8339	6002	4063	164,059	6097.57	
7.1	3/22/2014	87.5	8157	5808		199,733	6414.47	
7.2	3/22/2014	86.0	8125	5957		199,058	5365.12	
7.3	3/22/2014	87.9	8145	6156	3876	202,823	5379.88	
8.1	3/23/2014	85.1	7952	5324		168,379	6074.98	
8.2	3/23/2014	88.1	8097	4499		168,958	5344.17	
8.3	3/23/2014	88.4	7978	5788	4305	164,464	5131.31	
9.1	3/23/2014	88.7	9007	5498		205,479	6011.02	
9.2	3/23/2014	89.0	7772	5073		195,681	6372.12	
9.3	3/23/2014	88.4	7784	4927	4150	198,666	5240.83	
10.1	3/24/2014	87.8	8820	5288		200,070	5792.81	
10.2	3/24/2014	88.8	7685	5346		200,012	5095.45	
10.3	3/24/2014	88.7	7809	5645	4158	188,666	4903.81	
11.1	3/25/2014	86.1	7965	5681		208,477	6029.54	
11.2	3/25/2014	74.6	8451	6152		202,117	5534.17	
11.3	3/25/2014	82.9	8438	6205	4094	202,744	5271.90	
12.1	3/25/2014	86.7	7605	5679		208,193	5853.95	
12.2	3/26/2014	86.7	8643	5767		195,411	5858.52	
12.3	3/26/2014	86.9	7574	5584	3999	193,796	3852.07	
13.1	3/26/2014	85.8	7829	5833		201,320	6381.59	
13.2	3/26/2014	87.4	8064	5944		204,668	5662.64	
13.3	3/26/2014	87.0	7456	5351	4570	194,216	6252.46	
14.1	4/22/2014	87.0	7230	5802		201,760	5929.62	

STIMULATION INFORMATIOIN PER STAGE

API: 47-051-01661 Farm name: Russell Lee and Barbara Ann Bennett Well Name: SHL-26D-HS

Stage No.	Stim Date	Avg Rate (bpm)	ATP (psi)	Max BD Pressure	ISIP (psi)	Proppant (lbs)	Water (BBLS)	Amount of N^2/ other
14.2	4/22/2014	86.6	7665	6182		202,421	5787.61	
14.3	4/22/2014	87.1	7461	5917	4065	198,448	5303.98	
15.1	4/22/2014	87.4	7797	5686		202,150	5106.85	
15.2	4/22/2014	84.9	8295	5854		199,069	5443.69	
15.3	4/22/2014	31.1	9245	6706	5911	204,500	5472.79	
15B	4/23/2014	83.8	7973		4040		5509.10	
16.1	4/23/2014	90.3	7607	5438		201,298	5703.43	
16.2	4/23/2014	90.1	7779	5670		199,838	5549.00	
16.3	4/24/2014	90.6	7835	5187	4446	200,188	4906.33	
17.1	4/24/2014	90.1	7577	5031		198,040	5070.68	
17.2	4/24/2014	47.1	8835	8478		918	4725.17	
17B.2	4/24/2014	87.1	7494	6265		200,933	4582.57	
17B.3	4/24/2014	87.5	7355	5607	4507	203,544	5318.50	
18.1	4/24/2014	90.0	7088	5466		200,774	4864.67	
18.2	4/24/2014	90.4	7400	4891		200,384	4820.55	
18.3	4/24/2014	90.2	7253	4505	4503	201,030	6595.93	
19.1	4/25/2014	90.7	7178	5456		200,117	1289.02	
19.2	4/25/2014	90.4	7460	5011		200,344	342.79	
19.3	4/25/2014	88.3	7677	6080	4469	199,821	9447.83	
20.1	4/25/2014	85.8	7080	5465		200,400	5203.93	
20.2	4/25/2014	86.9	7219	5398		201,219	5254.14	
20.3	4/25/2014	87.2	7162	5812	4613	201,501	5231.33	
21.1	4/25/2014	86.5	7187	5295		201,346	5176.19	
21.2	4/25/2014	83.2	7448	5143		199,870	5041.95	
21.3	4/25/2014	88.3	6751	5272	4506	199,496	5006.00	
22.1	4/25/2014	89.2	6986	5511		200,665	5890.45	
22.2	4/25/2014	88.9	7363	5716		200,346	5203.59	
22.3	4/25/2014	72.5	8501	5646	4353	199,798	5189.14	
23.1	4/26/2014	80.1	7842	4864		200,198	6793.74	
23.2	4/26/2014	77.9	7892	6685		199,714	5536.26	
23.3	4/26/2014	83.5	7643	6113	4390	201,316	5006.88	
24.1	4/26/2014	87.7	6834	5586		200,764	4814.97	
24.2	4/26/2014	87.7	7309	5544		199,628	4888.64	
24.3	4/26/2014	88.8	7357	5233	3976	198,957	4508.02	
25.1	4/27/2014	86.2	6943	6183		189,743	5111.00	
25.2	4/27/2014	87.9	7255	8062		207,843	5011.26	
25.3	4/27/2014	88.2	7483	5767	4198	206,836	5015.74	
26.1	4/27/2014	83.5	6914	5039		195,253	5174.22	
26.2	4/27/2014	79.5	7545	5955		206,245	5348.79	
26.3	4/27/2014	87.4	7523	6044	4195	197,509	5277.50	
27.1	4/27/2014	88.3	6847	6406		200,459	7203.81	

STIMULATION INFORMATIOIN PER STAGE

API: 47-051-01661 Farm name: Russell Lee and Barbara Ann Bennett Well Name: SHL-26D-HS

Stage No.	Stim Date	Avg Rate (bpm)	ATP (psi)	Max BD Pressure	ISIP (psi)	Proppant (lbs)	Water (BBLS)	Amount of N^2/ other
27.2	4/27/2014	88.1	7399	5939		200,411	5307.86	
27.3	4/27/2014	88.1	7831	5862	4300	199,996	5301.88	
28.1	4/28/2014	88.7	6559	5680		200,646	5231.93	
28.2	4/28/2014	89.2	6645	5154		199,820	5138.60	
28.3	4/28/2014	88.9	6650	5011	4467	200,898	5102.88	

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API 47- 051 - 01661 Farm name Russell Lee and Barbara Ann Bennett Well number SHL26DHS

PRODUCING FORMATION(S)	DEPTHS	
Marcellus	6665.1 TVD	16108 MD

Please insert additional pages as applicable.

GAS TEST ☐ Build up ☐ Drawdown ■ Open Flow OIL TEST ■ Flow ☐ Pump

SHUT-IN PRESSURE Surface _____ psi Bottom Hole _____ psi DURATION OF TEST _____ hrs

OPEN FLOW	Gas	Oil	NGL	Water	GAS MEASURED BY
	2815 mcfpd	60 bpd	127 bpd	1088 bpd	☐ Estimated ■ Orifice ☐ Pilot

LITHOLOGY/ FORMATION NAME	TOP DEPTH IN FT TVD	BOTTOM DEPTH IN FT TVD	TOP DEPTH IN FT MD	BOTTOM DEPTH IN FT MD	DESCRIBE ROCK TYPE AND RECORD QUANTITY AND TYPE OF FLUID (FRESHWATER, BRINE, OIL, GAS, H_2S, ETC)
	0		0		

PLEASE SEE FORMATION SHEET

Please insert additional pages as applicable.

Drilling Contractor Nabors Drilling USA, LP
Address 515 West Greens Rd, Suite 1000 City Houston State TX Zip 77067-4525

Logging Company Horizon Well Logging, LLC
Address 7136 S. Yale Ave. Suite 414 City Tulsa State OK Zip 74136

Cementing Company CalFrac
Address 717 17th St., Suite 1445 City Denver State CO Zip 80202

Stimulating Company Halliburton Energy Services
Address 121 Champion Way, Suite 210 City Canonsburg State PA Zip 15317

Please insert additional pages as applicable.

Completed by Des Singer Telephone 724-820-3061
Signature [signature] Title Eng. Analyst Date 8-6-14

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

FORMATIONS

API 47-051-5101661 Farm Name Russell Lee and Barbara Ann Bennett Well Name SHL26D

Lithology/Formation	Top Depth in FT TVD	Bottom Depth in FT TVD	Top Depth in Ft MD	Bottom Depth in FT MD	Describe Rock Type and Record Quantity and Type of Fluid (Freshwater, Brine, Oil, Gas, H2S, ETC)
Shale	0	808	0	808	
Pittsburgh Coal	808	817	808	817	
Shale and Sandstone	817	1264	817	1264	
Dunkard Sand	1264	1275	1264	1275	
Shale	1275	1446	1275	1446	
Gas Sand	1446	1485	1446	1485	
Shale	1485	1577	1485	1577	
1st Salt Sand	1577	1601	1577	1601	
Shale	1601	1610	1601	1610	
2nd Salt Sand	1610	1655	1610	1655	
Shale	1655	1738	1655	1738	
Maxton Sand	1738	1750	1738	1750	
Shale	1750	1793	1750	1793	
Big Lime	1793	1873	1793	1873	
Big Injun	1873	2067	1873	2067	
Price	2067	2425	2067	2425	
Murrysville	2425	2439	2425	2439	
Shale	2439	2636	2439	2636	
50' Sand	2636	2638	2636	2638	
Shale	2638	2691	2638	2691	
30' Sand	2691	2700	2691	2700	
Shale	2700	2742	2700	2742	
Gordon Stray	2742	2757	2742	2757	
Shale	2757	2793	2757	2793	
Gordon	2793	2806	2793	2806	
Shale	2806	2902	2806	2902	
Fifth Sand	2902	2936	2902	2936	
Shale	2936	3342	2936	3342	
Speechley Sand	3342	3370	3342	3370	
Shale	3370	4378	3370	4484	
Warren Sand	4378	4387	4484	4497	
Shale	4387	5045	4497	5362	
Java Shale	5045	5216	5362	5584	
Pipe Creek Shale	5216	5273	5584	5657	
Angola Shale	5273	5898	5657	6461	
Rhinestreet	5898	6314	6461	7022	
Cashaqua	6314	6405	7022	7149	
Middlesex	6405	6440	7149	7201	
West River	6440	6492	7201	7281	
Burkett	6492	6515	7281	7319	
Tully Limestone	6515	6545	7319	7371	
Hamilton	6545	6656	7371	7629	
Marcellus	6656	6706	7629	not encountered	Gas

Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date:	3/16/2014
Job End Date:	4/5/2014
State:	West Virginia
County:	Marshall
API Number:	47-051-01661-00-00
Operator Name:	Noble Energy, Inc.
Well Name and Number:	SHL26 D
Longitude:	-80.54840800
Latitude:	39.97322500
Datum:	NAD27
Federal/Tribal Well:	NO
True Vertical Depth:	6,665
Total Base Water Volume (gal):	19,898,789
Total Base Non Water Volume:	0

FracFocus Chemical Disclosure Registry

GROUNDWATER PROTECTION COUNCIL

Oil & Gas

51-01661

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
Fresh Water	Operator	Base Fluid					
			Fresh Water	7732-18-5	100.00000	90.18708	Density = 8.330
SAND - PREMIUM WHITE	Halliburton	Proppant					
			Crystalline silica, quartz	14808-60-7	100.00000	7.07275	
SAND - COMMON WHITE	Halliburton	Proppant					
			Crystalline silica, quartz	14808-60-7	100.00000	1.75641	
HYDROCHLORIC ACID 5-10%	Halliburton	Solvent					
			Hydrochloric acid	7647-01-0	10.00000	0.08430	
FDP-S1078-12	Halliburton	Friction Reducer					
			Hydrotreated light petroleum distillate	64742-47-8	30.00000	0.02049	
			Alcohols, C12-16, ethoxylated	68551-12-2	10.00000	0.00683	
			Ammonium chloride	12125-02-9	10.00000	0.00683	
			9-Octadecenamide, n,n-bis-2 (hydroxy-ethyl)-,(Z)	93-83-4	5.00000	0.00342	
FE-1A ACIDIZING COMPOSITION	Halliburton	Additive					
			Acetic anhydride	108-24-7	100.00000	0.00437	
			Acetic acid	64-19-7	60.00000	0.00262	

BE-9	Halliburton	Biocide					
			Tributyl tetradecyl phosphonium chloride	81741-28-8	10.00000	0.00377	
Biovert NWB	Halliburton	Viscosifier					
			Polylactide resin	Confidential	100.00000	0.00307	
LP-65MC Scale Inhibitor	Halliburton	Scale Inhibitor					
			Ammonium chloride	12125-02-9	10.00000	0.00234	
LoSurf-300D	Halliburton	Non-Ionic Surfactant					
			Ethanol	64-17-5	60.00000	0.00088	
			Heavy aromatic petroleum naphtha	64742-94-5	30.00000	0.00044	
			Naphthalene	91-20-3	5.00000	0.00007	
			Poly(oxy-1,2-ethanediyl), alpha-(4-nonylphenyl)-omega-hydroxy-, branched	127087-87-0	5.00000	0.00007	
			1,2,4 Trimethylbenzene	95-63-6	1.00000	0.00001	
FR-66	Halliburton	Friction Reducer					
			Hydrotreated light petroleum distillate	64742-47-8	30.00000	0.00088	
HAI-OS ACID INHIBITOR	Halliburton	Corrosion Inhibitor					
			Methanol	67-56-1	60.00000	0.00043	
			Propargyl alcohol	107-19-7	10.00000	0.00007	
CALCIUM CHLORIDE - FLAKE	Halliburton	Additive					
			Calcium chloride	10043-52-4	100.00000	0.00031	
			Potassium chloride	7447-40-7	5.00000	0.00002	
			Sodium chloride	7647-14-5	2.00000	0.00001	
FDP-S1125-14	Halliburton	Diverter					
			Contains no hazardous substances	NA	100.00000	0.00005	
D-AIR 3000L	Halliburton	Defoamer					
			Alkenes	Confidential	100.00000	0.00001	Denise Tuck, Halliburton 3000 N. Sam Houston Pkwy E., Houston, TX 77032 281-871-6226
			Silica, amorphous precipitated	67762-90-7	30.00000	0.00000	
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 Ingredient(s)					
			Water	7732-18-5		0.91710	
		Other Ingredient(s)					
			Inorganic salt	Confidential		0.02049	
		Other Ingredient(s)					
			Organic phosphonate	Confidential		0.01406	
		Other Ingredient(s)					
			Fatty acid ester	Confidential		0.00342	
		Other Ingredient(s)					

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			Polyacrylamide copolymer	Confidential		0.00088	
		Other Ingredient(s)					
			Oxyalkylated phenolic resin	Confidential		0.00044	
		Other Ingredient(s)					
			Formaldehyde	50-00-0		0.00023	
		Other Ingredient(s)					
			Fatty acids, tall oil	Confidential		0.00022	
		Other Ingredient(s)					
			Reaction product of acetophenone, formaldehyde, thiourea and oleic acid in dimethyl formamide	68527-49-1		0.00022	
		Other Ingredient(s)					
			Alcohols, C14-C15, ethoxylated	68951-67-7		0.00022	
		Other Ingredient(s)					
			Alcohols, C12-16, ethoxylated	68551-12-2		0.00015	
		Other Ingredient(s)					
			Fatty acid tall oil amide	Confidential		0.00015	
		Other Ingredient(s)					
			Sodium chloride	7647-14-5		0.00015	
		Other Ingredient(s)					
			Ammonium chloride	12125-02-9		0.00015	
		Other Ingredient(s)					
			Oxyalkylated phenolic resin	Confidential		0.00015	
		Other Ingredient(s)					
			Olefins	Confidential		0.00004	
		Other Ingredient(s)					
			Olefins	Confidential		0.00004	
		Other Ingredient(s)					
			Sorbitan monooleate polyoxyethylene derivative	9005-65-6		0.00003	
		Other Ingredient(s)					
			Sorbitan, mono-9-octadecenoate, (Z)	1338-43-8		0.00003	
		Other Ingredient(s)					
			Strontium chloride	10476-85-4		0.00002	
		Other Ingredient(s)					
			Olefins	Confidential		0.00001	
		Other Ingredient(s)					
			Olefins	Confidential		0.00001	
		Other Ingredient(s)					
			Polypropylene glycol	25322-69-4		0.00000	

* 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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PATHFINDER

noble energy

Noble Energy SHL-26D-HS Gyro+MWD 0ft to 16108ft MD Survey Report

(Def Survey)

Report Date:	December 10, 2013 - 10:26 AM
Client:	Noble Energy
Field:	WV Marshall County (NAD 27)
Structure / Slot:	Noble Energy SHL-26 Pad / SHL-26D-HS
Well:	SHL-26D-HS
Borehole:	Original Borehole
UWI / API#:	Unknown / Unknown
Survey Name:	Noble Energy SHL-26D-HS Gyro+MWD 0ft to 16108ft MD
Survey Date:	November 22, 2013
Tort / AHD / DDI / ERD Ratio:	297.079 ° / 11020.897 ft / 6.896 / 1.645
Coordinate Reference System:	NAD27 West Virginia State Plane, Northern Zone, US Feet
Location Lat / Long:	N 39° 58' 23.61422", W 80° 32' 54.27486"
Location Grid N/E Y/X:	N 538304.570 ftUS, E 1706170.683 ftUS
CRS Grid Convergence Angle:	-0.6686 °
Grid Scale Factor:	0.99995997
Version / Patch:	2.7.998.0

Survey / DLS Computation:	Minimum Curvature / Lubinski
Vertical Section Azimuth:	339.997 ° (Grid North)
Vertical Section Origin:	0.000 ft, 0.000 ft
TVD Reference Datum:	KB
TVD Reference Elevation:	1331.890 ft above MSL
Seabed / Ground Elevation:	1309.180 ft above MSL
Magnetic Declination:	-8.413 °
Total Gravity Field Strength:	999.3453mgn (9.80665 Based)
Gravity Model:	GARM
Total Magnetic Field Strength:	53134.650 nT
Magnetic Dip Angle:	67.516 °
Declination Date:	November 22, 2013
Magnetic Declination Model:	HDGM 2013
North Reference:	Grid North
Grid Convergence Used:	-0.6686 °
Total Corr Mag North->Grid North:	-7.7443 °
Local Coord Referenced To:	Well Head

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Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	TVDSS (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	BR (°/100ft)	TR (°/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ' ")	Longitude (E/W ° ' ")	Directional Difficulty Index
SHL	0.00	0.00	0.00	0.00	-1331.89	0.00	0.00	0.00	N/A	N/A	N/A	538304.57	1706170.68	N 39 58 23.61	W 80 32 54.27	0.00
	123.00	0.25	104.06	123.00	-1208.89	-0.15	-0.07	0.26	0.20	0.20	0.00	538304.50	1706170.94	N 39 58 23.61	W 80 32 54.27	0.00
	223.00	0.31	140.41	223.00	-1108.89	-0.53	-0.33	0.64	0.18	0.06	36.35	538304.24	1706171.33	N 39 58 23.61	W 80 32 54.27	0.00
	323.00	0.41	149.48	323.00	-1008.89	-1.13	-0.84	1.00	0.11	0.10	9.07	538303.73	1706171.68	N 39 58 23.61	W 80 32 54.26	0.00
	423.00	0.35	164.95	422.99	-908.90	-1.79	-1.45	1.26	0.12	-0.06	15.47	538303.12	1706171.94	N 39 58 23.60	W 80 32 54.26	0.13
	523.00	0.51	170.47	522.99	-808.90	-2.53	-2.18	1.41	0.17	0.16	5.52	538302.39	1706172.10	N 39 58 23.59	W 80 32 54.26	0.36
	623.00	0.29	173.26	622.99	-708.90	-3.22	-2.87	1.52	0.22	-0.22	2.79	538301.70	1706172.20	N 39 58 23.59	W 80 32 54.25	0.56
	723.00	0.34	190.91	722.99	-608.90	-3.72	-3.41	1.49	0.11	0.05	17.65	538301.16	1706172.17	N 39 58 23.58	W 80 32 54.26	0.67
	823.00	0.10	254.46	822.99	-508.90	-3.96	-3.73	1.35	0.31	-0.24	63.55	538300.84	1706172.03	N 39 58 23.58	W 80 32 54.26	0.81
	923.00	0.05	307.84	922.99	-408.90	-3.92	-3.72	1.23	0.08	-0.05	53.38	538300.85	1706171.91	N 39 58 23.58	W 80 32 54.26	0.84
	1023.00	0.13	330.46	1022.99	-308.90	-3.77	-3.60	1.14	0.09	0.08	22.62	538300.97	1706171.82	N 39 58 23.58	W 80 32 54.26	0.88
	1123.00	0.17	334.55	1122.99	-208.90	-3.51	-3.37	1.02	0.04	0.04	4.09	538301.20	1706171.70	N 39 58 23.58	W 80 32 54.26	0.92
	1223.00	0.27	337.49	1222.99	-108.90	-3.13	-3.01	0.87	0.10	0.10	2.94	538301.56	1706171.55	N 39 58 23.58	W 80 32 54.26	0.97
	1323.00	0.52	334.20	1322.98	-8.91	-2.44	-2.39	0.58	0.25	0.25	-3.29	538302.18	1706171.26	N 39 58 23.59	W 80 32 54.27	1.08
	1423.00	0.42	341.01	1422.98	91.09	-1.62	-1.63	0.26	0.11	-0.10	6.81	538302.94	1706170.95	N 39 58 23.60	W 80 32 54.27	1.16
	1523.00	0.36	353.91	1522.98	191.09	-0.95	-0.97	0.11	0.11	-0.06	12.90	538303.60	1706170.79	N 39 58 23.60	W 80 32 54.27	1.23
	1623.00	0.49	10.80	1622.97	291.08	-0.28	-0.24	0.16	0.18	0.13	16.89	538304.33	1706170.84	N 39 58 23.61	W 80 32 54.27	1.30
	1723.00	0.71	33.75	1722.97	391.08	0.45	0.69	0.58	0.32	0.22	22.95	538305.26	1706171.26	N 39 58 23.62	W 80 32 54.27	1.41
	1823.00	0.48	54.25	1822.96	491.07	0.93	1.45	1.26	0.31	-0.23	20.50	538306.02	1706171.95	N 39 58 23.63	W 80 32 54.26	1.50
	1923.00	0.88	40.46	1922.96	591.07	1.42	2.28	2.10	0.43	0.40	-13.79	538306.85	1706172.79	N 39 58 23.64	W 80 32 54.25	1.60
	2023.00	0.67	22.43	2022.95	691.06	2.23	3.41	2.82	0.32	-0.21	-18.03	538307.98	1706173.51	N 39 58 23.65	W 80 32 54.24	1.69
	2123.00	0.71	359.77	2122.94	791.05	3.25	4.57	3.05	0.27	0.04	-22.66	538309.14	1706173.73	N 39 58 23.66	W 80 32 54.24	1.76
	2223.00	0.58	359.91	2222.93	891.04	4.31	5.69	3.04	0.13	-0.13	0.14	538310.26	1706173.72	N 39 58 23.67	W 80 32 54.24	1.80
	2323.00	0.47	358.50	2322.93	991.04	5.17	6.61	3.03	0.11	-0.11	-1.41	538311.18	1706173.71	N 39 58 23.68	W 80 32 54.24	1.84
	2423.00	0.34	331.94	2422.93	1091.04	5.86	7.28	2.88	0.23	-0.13	-26.56	538311.85	1706173.56	N 39 58 23.69	W 80 32 54.24	1.88
	2523.00	0.36	346.92	2522.93	1191.04	6.46	7.65	2.67	0.09	0.02	14.98	538312.42	1706173.35	N 39 58 23.69	W 80 32 54.24	1.91
	2623.00	0.30	344.61	2622.92	1291.03	7.03	8.41	2.53	0.06	-0.06	-2.31	538312.98	1706173.21	N 39 58 23.70	W 80 32 54.24	1.93
	2723.00	0.22	326.75	2722.92	1391.03	7.48	8.82	2.35	0.11	-0.08	-17.86	538313.39	1706173.04	N 39 58 23.70	W 80 32 54.25	1.95
	2823.00	0.14	302.60	2822.92	1491.03	7.77	9.05	2.15	0.11	-0.08	-24.15	538313.62	1706172.83	N 39 58 23.70	W 80 32 54.25	1.96
	2923.00	0.13	306.92	2922.92	1591.03	7.96	9.18	1.95	0.01	-0.01	4.32	538313.75	1706172.64	N 39 58 23.71	W 80 32 54.25	1.97
	3023.00	0.26	308.32	3022.92	1691.03	8.25	9.39	1.68	0.13	0.13	1.40	538313.96	1706172.37	N 39 58 23.71	W 80 32 54.25	1.99
	3123.00	0.17	282.70	3122.92	1791.03	8.52	9.56	1.36	0.13	-0.09	-25.62	538314.13	1706172.04	N 39 58 23.71	W 80 32 54.26	2.01
	3188.00	0.19	267.72	3187.92	1856.03	8.60	9.58	1.16	0.08	0.03	-23.05	538314.15	1706171.84	N 39 58 23.71	W 80 32 54.26	2.02
	3297.00	0.29	286.52	3296.92	1965.03	8.82	9.65	0.71	0.12	0.09	17.25	538314.22	1706171.40	N 39 58 23.71	W 80 32 54.27	2.04
	3392.00	1.56	38.04	3391.91	2060.02	9.65	10.74	1.28	1.78	1.34	117.39	538315.31	1706171.96	N 39 58 23.72	W 80 32 54.26	2.18
	3487.00	1.43	29.41	3486.88	2154.99	11.11	12.79	2.68	0.27	-0.14	-9.08	538317.36	1706173.34	N 39 58 23.74	W 80 32 54.24	2.25
	3581.00	4.14	43.56	3580.76	2248.87	13.38	16.27	5.57	2.95	2.88	15.05	538320.84	1706176.26	N 39 58 23.78	W 80 32 54.21	2.46
	3675.00	11.10	49.68	3673.87	2341.98	19.33	25.60	13.82	7.41	7.40	-3.06	538330.17	1706184.50	N 39 58 23.87	W 80 32 54.10	2.85
	3770.00	15.94	45.88	3766.21	2434.32	29.14	41.63	29.16	5.25	5.09	5.47	538346.20	1706199.84	N 39 58 24.03	W 80 32 53.91	3.14

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	TVDSS (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	BR (°/100ft)	TR (°/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ' ")	Longitude (E/W ° ' ")	Directional Difficulty Index
	3864.00	19.03	58.85	3855.66	2523.77	37.52	59.92	52.15	5.98	4.24	13.80	538363.48	1706222.83	N 39 58 24.20	W 80 32 53.61	3.41
	3958.00	22.28	64.68	3943.36	2611.47	42.27	74.83	81.98	3.35	2.50	6.20	538379.39	1706252.66	N 39 58 24.36	W 80 32 53.23	3.59
	4053.00	25.66	61.49	4030.19	2699.27	46.98	92.35	116.34	3.81	3.56	-3.36	538396.92	1706287.02	N 39 58 24.54	W 80 32 52.79	3.76
	4148.00	30.03	64.21	4113.78	2781.89	52.49	112.81	156.43	5.71	5.55	2.88	538417.37	1706327.11	N 39 58 24.75	W 80 32 52.28	3.93
	4242.00	34.02	64.75	4192.71	2860.82	57.39	134.77	202.47	4.15	4.14	0.57	538439.34	1706373.15	N 39 58 24.97	W 80 32 51.69	4.06
	4337.00	39.66	62.79	4268.32	2936.43	63.67	160.22	254.00	5.24	5.09	-2.06	538464.79	1706424.67	N 39 58 25.23	W 80 32 51.04	4.20
	4432.00	42.71	61.27	4339.81	3007.92	72.37	189.58	309.22	3.38	3.21	-1.60	538494.14	1706479.89	N 39 58 25.52	W 80 32 50.33	4.31
	4526.00	43.56	60.11	4408.41	3076.52	82.77	221.04	365.26	1.24	0.90	-1.23	538525.61	1706535.93	N 39 58 25.84	W 80 32 49.62	4.38
	4621.00	42.91	60.39	4477.62	3145.73	93.78	253.34	421.76	0.71	-0.68	0.29	538557.90	1706592.42	N 39 58 26.17	W 80 32 48.90	4.45
	4715.00	41.22	64.60	4547.42	3215.53	102.04	282.44	477.57	3.50	-1.80	4.48	538587.00	1706648.23	N 39 58 26.46	W 80 32 48.18	4.53
	4810.00	41.79	62.37	4618.57	3288.68	109.18	310.55	533.89	1.67	0.60	-2.35	538615.10	1706704.55	N 39 58 26.74	W 80 32 47.46	4.59
	4904.00	41.30	60.68	4688.92	3357.03	116.36	340.26	588.69	1.30	-0.52	-1.80	538644.82	1706759.35	N 39 58 27.04	W 80 32 46.76	4.64
	4999.00	39.05	60.73	4761.50	3429.61	128.26	370.25	642.14	2.37	-2.37	0.05	538674.80	1706812.76	N 39 58 27.35	W 80 32 46.08	4.70
	5094.00	38.75	61.34	4835.44	3503.55	137.55	399.14	694.33	0.51	-0.32	0.64	538703.69	1706864.98	N 39 58 27.64	W 80 32 45.42	4.73
	5188.00	38.46	61.58	4908.90	3577.01	148.26	427.16	745.85	0.35	-0.31	0.26	538731.71	1706916.50	N 39 58 27.92	W 80 32 44.76	4.77
	5283.00	38.21	61.09	4983.41	3651.52	154.68	455.02	797.78	0.38	-0.26	0.43	538759.57	1706968.42	N 39 58 28.20	W 80 32 44.10	4.80
	5378.00	39.63	61.58	5057.32	3725.43	163.22	483.25	850.36	1.52	1.49	-0.45	538787.80	1707021.00	N 39 58 28.49	W 80 32 43.43	4.84
	5473.00	40.29	62.51	5130.14	3798.25	171.66	511.86	904.25	0.95	0.69	1.00	538816.41	1707074.89	N 39 58 28.78	W 80 32 42.74	4.87
	5567.00	38.73	61.01	5202.68	3870.77	180.22	540.14	956.93	1.95	-1.68	-1.60	538844.69	1707127.58	N 39 58 29.06	W 80 32 42.07	4.91
	5662.00	38.29	61.74	5277.00	3945.11	189.09	568.48	1008.88	0.67	-0.46	0.77	538873.03	1707179.49	N 39 58 29.35	W 80 32 41.40	4.93
	5757.00	39.17	61.87	5351.11	4019.22	197.56	596.56	1061.24	0.93	0.93	0.14	538901.11	1707231.88	N 39 58 29.63	W 80 32 40.73	4.96
	5851.00	40.24	60.59	5423.43	4091.54	206.72	625.47	1113.87	1.43	1.14	-1.38	538930.01	1707284.51	N 39 58 29.92	W 80 32 40.06	4.99
	5946.00	40.29	62.40	5495.92	4164.03	215.79	654.77	1167.82	1.23	0.05	1.91	538959.31	1707338.46	N 39 58 30.22	W 80 32 39.37	5.02
	6041.00	38.37	60.08	5569.41	4237.52	224.93	683.71	1220.61	2.55	-2.02	-2.44	538988.25	1707391.24	N 39 58 30.51	W 80 32 38.70	5.06
	6135.00	36.35	59.02	5644.12	4312.23	235.26	712.60	1269.78	2.26	-2.15	-1.13	539017.14	1707440.41	N 39 58 30.80	W 80 32 38.07	5.09
	6230.00	37.02	61.63	5720.01	4388.12	244.74	740.79	1319.49	2.23	1.34	2.96	539045.33	1707490.11	N 39 58 31.09	W 80 32 37.44	5.12
	6320.00	39.04	64.77	5791.10	4459.21	251.17	765.58	1368.79	2.06	0.47	3.27	539070.11	1707539.41	N 39 58 31.34	W 80 32 36.81	5.14
	6415.00	42.12	57.27	5863.81	4531.92	260.87	795.31	1422.12	6.65	4.29	-7.89	539099.84	1707592.74	N 39 58 31.64	W 80 32 36.13	5.19
	6509.00	42.52	58.27	5933.32	4601.43	274.27	829.06	1475.68	0.83	0.43	1.06	539133.59	1707646.28	N 39 58 31.98	W 80 32 35.45	5.21
	6604.00	42.00	58.03	6003.09	4671.20	287.51	863.08	1530.42	0.49	0.48	-0.25	539167.61	1707701.04	N 39 58 32.32	W 80 32 34.75	5.23
	6698.00	42.03	56.61	6072.40	4740.51	301.43	897.38	1583.67	1.42	-0.99	-1.51	539201.89	1707754.49	N 39 58 32.66	W 80 32 34.07	5.26
	6793.00	40.71	48.47	6143.74	4811.85	320.18	935.43	1633.68	5.83	-1.39	-8.57	539239.96	1707804.27	N 39 58 33.05	W 80 32 33.43	5.30
	6840.00	40.27	44.69	6179.40	4847.60	332.30	956.40	1655.81	5.32	-0.94	-8.06	539260.93	1707826.43	N 39 58 33.26	W 80 32 33.15	5.32
	6888.00	41.43	39.81	6215.81	4883.92	348.92	979.64	1676.90	7.06	2.42	-10.15	539284.16	1707847.51	N 39 58 33.49	W 80 32 32.88	5.34
	6935.00	42.85	35.47	6250.67	4918.78	363.81	1004.60	1696.13	6.89	3.02	-9.23	539309.13	1707866.74	N 39 58 33.74	W 80 32 32.64	5.36
	6982.00	43.33	31.25	6285.00	4953.11	382.96	1031.41	1713.77	6.22	1.02	-8.98	539335.94	1707884.38	N 39 58 34.00	W 80 32 32.42	5.38
	7029.00	43.12	26.11	6319.28	4987.37	404.20	1059.63	1729.21	7.50	-0.45	-10.94	539364.15	1707899.82	N 39 58 34.28	W 80 32 32.22	5.40
	7077.00	43.64	21.73	6354.09	5022.20	427.98	1089.81	1742.59	6.45	1.50	-9.13	539394.33	1707913.20	N 39 58 34.58	W 80 32 32.06	5.42
	7124.00	45.23	16.74	6387.61	5055.72	453.50	1120.92	1753.43	8.01	2.96	-10.62	539425.44	1707924.03	N 39 58 34.89	W 80 32 31.92	5.44
	7171.00	46.94	10.89	6420.22	5088.33	481.62	1153.77	1761.48	9.67	3.64	-12.45	539458.29	1707932.09	N 39 58 35.22	W 80 32 31.82	5.47
	7218.00	49.03	7.63	6451.08	5119.79	512.08	1188.23	1767.08	6.81	4.45	-6.04	539492.75	1707937.69	N 39 58 35.56	W 80 32 31.76	5.49
	7266.00	51.01	4.51	6482.52	5150.63	545.12	1224.80	1770.06	6.47	4.13	-6.50	539529.31	1707941.56	N 39 58 35.92	W 80 32 31.71	5.50
	7313.00	52.94	2.84	6511.48	5179.59	579.03	1261.74	1773.32	4.97	4.11	-3.55	539568.26	1707943.93	N 39 58 36.29	W 80 32 31.69	5.52
	7360.00	55.64	0.37	6538.91	5207.02	614.50	1299.88	1774.38	7.16	5.74	-5.26	539604.39	1707944.96	N 39 58 36.66	W 80 32 31.68	5.54
	7407.00	58.09	356.23	6564.61	5232.72	651.86	1339.20	1773.19	9.03	5.21	-8.81	539643.71	1707943.80	N 39 58 37.05	W 80 32 31.70	5.56
	7455.00	60.10	350.70	6589.27	5257.38	691.89	1380.09	1768.48	10.73	4.19	-11.52	539684.60	1707939.09	N 39 58 37.46	W 80 32 31.77	5.59
	7502.00	64.37	347.15	6611.17	5279.28	732.96	1420.68	1760.47	11.28	9.09	-7.55	539725.39	1707931.08	N 39 58 37.88	W 80 32 31.88	5.61
	7550.00	68.04	344.47	6630.53	5298.64	776.04	1463.44	1749.70	9.19	7.65	-5.58	539767.95	1707920.30	N 39 58 38.28	W 80 32 32.02	5.63
	7597.00	71.58	343.77	6646.75	5314.86	820.64	1505.87	1737.63	7.66	7.53	-1.49	539810.37	1707908.23	N 39 58 38.69	W 80 32 32.18	5.65
	7645.00	74.24	340.63	6660.86	5328.97	868.47	1549.54	1723.59	8.35	5.54	-6.54	539854.04	1707894.20	N 39 58 39.12	W 80 32 32.37	5.67
	7692.00	76.98	338.24	6672.54	5340.65	911.99	1592.15	1707.60	7.63	5.83	-5.09	539896.65	1707878.21	N 39 58 39.54	W 80 32 32.58	5.69
	7739.00	80.16	334.95	6681.86	5349.97	957.96	1634.41	1689.30	9.64	6.77	-7.00	539938.91	1707859.91	N 39 58 39.96	W 80 32 32.82	5.71
	7788.00	83.32	331.97	6688.61	5356.72	1004.18	1676.01	1668.52	9.20	6.72	-6.34	539980.51	1707839.13	N 39 58 40.37	W 80 32 33.10	5.73
	7834.00	85.46	329.45	6693.30	5361.41	1051.30	1717.67	1645.15	6.87	4.48	-5.25	540022.17	1707815.76	N 39 58 40.78	W 80 32 33.40	5.75
	7881.00	86.70	327.65	6696.52	5364.63	1097.25	1757.67	1620.68	4.64	2.64	-3.83	540062.16	1707791.30	N 39 58 41.17	W 80 32 33.72	5.77
	7929.00	88.45	325.70	6698.55	5366.66	1143.91	1797.74	1594.34	5.46	3.65	-4.06	540102.23	1707764.95	N 39 58 41.56	W 80 32 34.07	5.78
	7976.00	90.10	325.03	6699.14	5367.25	1189.38	1836.40	1567.63	3.79	3.51	-1.43	540140.89	1707738.25	N 39 58 41.94	W 80 32 34.41	5.80
	8094.00	90.03	324.44	6699.01	5367.12	1303.22	1932.75	1499.50	0.50	-0.06	-0.50	540237.23	1707670.12	N 39 58 42.89	W 80 32 35.30	5.82
	8189.00	90.09	322.73	6698.91	5367.02	1394.35	2009.19	1443.11	1.80	0.06	-1.80	540313.68	1707613.73	N 39 58 43.63	W 80 32 36.04	5.85
	8284.00	90.69	322.94	6698.26	5366.37	1485.11	2084.90	1385.72	0.67	0.63	0.22	540389.38	1707556.34	N 39 58 44.38	W 80 32 36.79	5.87
	8378.00	90.17	321.07	6697.58	5365.67	1574.51	2158.97	1327.86	2.06	-0.55	-1.99	540463.45	1707498.48	N 39 58 45.10	W 80 32 37.54	5.89
	8473.00	90.09	318.82	6697.34	5365.45	1663.75	2231.68	1266.73	2.37	-0.08	-2.37	540536.16	1707437.36	N 39 58 45.81	W 80 32 38.34	5.91

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Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	TVDSS (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	BR (°/100ft)	TR (°/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ' ")	Longitude (E/W ° ' ")	Directional Difficulty Index
	8568.00	91.17	317.81	6696.30	5364.41	1752.02	2302.62	1203.56	1.56	1.14	-1.06	540607.09	1707374.19	N 39 58 46.51	W 80 32 39.16	5.93
	8662.00	91.69	315.98	6693.95	5362.06	1838.45	2371.23	1139.34	2.02	0.55	-1.95	540675.70	1707309.98	N 39 58 47.18	W 80 32 40.00	5.95
	8757.00	92.49	317.31	6690.49	5358.60	1925.60	2440.25	1074.17	1.63	0.84	1.40	540744.72	1707244.81	N 39 58 47.85	W 80 32 40.84	5.97
	8852.00	92.58	318.26	6686.28	5354.39	2013.47	2510.54	1010.40	1.00	0.09	1.00	540815.01	1707181.04	N 39 58 48.54	W 80 32 41.67	5.99
	8945.00	91.98	319.51	6682.58	5350.69	2100.15	2580.55	949.30	1.49	-0.65	1.34	540885.01	1707119.94	N 39 58 49.22	W 80 32 42.47	6.01
	9040.00	91.40	320.72	6679.78	5347.89	2189.45	2653.42	888.41	1.41	-0.61	1.27	540957.87	1707059.05	N 39 58 49.94	W 80 32 43.26	6.02
	9135.00	90.95	322.51	6677.83	5345.94	2279.58	2727.86	829.43	1.94	-0.47	1.88	541032.32	1707000.08	N 39 58 50.67	W 80 32 44.03	6.04
	9229.00	90.00	324.57	6677.05	5345.16	2369.72	2803.46	773.58	2.41	-1.01	2.19	541107.91	1706944.23	N 39 58 51.41	W 80 32 44.76	6.06
	9325.00	89.46	326.30	6677.51	5345.62	2462.63	2882.51	719.12	1.89	-0.56	1.80	541186.95	1706889.77	N 39 58 52.18	W 80 32 45.47	6.08
	9419.00	88.37	327.33	6679.29	5347.40	2554.14	2961.16	667.68	1.60	-1.16	1.10	541265.60	1706838.33	N 39 58 52.95	W 80 32 46.14	6.10
	9513.00	88.60	327.10	6681.77	5349.88	2645.77	3040.16	618.79	0.35	0.24	-0.24	541344.60	1706787.45	N 39 58 53.73	W 80 32 46.81	6.11
	9608.00	88.80	327.67	6683.93	5352.04	2738.46	3120.16	565.60	0.64	0.21	0.60	541424.59	1706738.26	N 39 58 54.51	W 80 32 47.46	6.13
	9702.00	89.31	328.15	6686.30	5354.41	2830.34	3199.77	515.08	0.73	-0.52	0.51	541504.20	1706688.34	N 39 58 55.29	W 80 32 48.13	6.14
	9797.00	90.03	328.69	6687.67	5355.78	2923.40	3280.69	465.94	1.90	1.81	0.57	541585.12	1706639.60	N 39 58 56.09	W 80 32 48.78	6.16
	9892.00	89.46	325.54	6688.10	5356.21	3015.99	3360.46	414.37	3.37	-0.60	-3.32	541664.88	1706585.03	N 39 58 56.87	W 80 32 49.46	6.18
	9986.00	91.06	325.38	6687.67	5355.78	3106.98	3437.88	361.07	1.71	1.70	-0.17	541742.31	1706531.74	N 39 58 57.63	W 80 32 50.15	6.19
	10081.00	90.17	322.91	6686.65	5354.76	3198.36	3514.87	305.43	2.76	-0.94	-2.60	541819.29	1706476.10	N 39 58 58.38	W 80 32 50.88	6.21
	10176.00	91.57	321.00	6685.21	5353.32	3288.90	3590.13	247.49	1.82	1.47	-1.06	541894.55	1706418.16	N 39 58 59.12	W 80 32 51.63	6.23
	10271.00	91.49	323.65	6682.67	5350.78	3379.60	3665.75	190.04	1.84	-0.08	1.84	541970.16	1706360.71	N 39 58 59.86	W 80 32 52.38	6.24
	10365.00	91.00	324.45	6680.83	5348.74	3469.96	3741.82	134.87	1.00	-0.52	0.85	542048.23	1706305.54	N 39 59 0.61	W 80 32 53.10	6.26
	10460.00	90.17	325.04	6679.66	5347.77	3561.61	3819.40	80.04	1.07	-0.87	0.62	542123.80	1706250.72	N 39 59 1.37	W 80 32 53.82	6.27
	10555.00	89.94	320.33	6679.57	5347.68	3653.66	3897.66	26.48	1.38	-0.24	1.38	542202.26	1706197.16	N 39 59 2.14	W 80 32 54.52	6.28
	10649.00	90.49	328.00	6679.21	5347.32	3745.31	3976.84	-24.49	1.87	0.59	1.78	542281.24	1706146.20	N 39 59 2.91	W 80 32 55.19	6.30
	10744.00	90.86	328.16	6678.10	5346.21	3838.25	4057.47	-74.71	0.42	0.39	0.17	542361.88	1706095.97	N 39 59 3.70	W 80 32 55.84	6.31
	10839.00	91.23	328.38	6676.36	5344.47	3931.26	4138.25	-124.67	0.45	0.39	0.23	542442.65	1706046.02	N 39 59 4.49	W 80 32 56.50	6.32
	10933.00	91.52	329.06	6674.11	5342.22	4023.41	4218.57	-173.46	0.79	0.31	0.72	542522.95	1705997.23	N 39 59 5.28	W 80 32 57.14	6.33
	11028.00	91.43	328.03	6671.66	5339.77	4116.59	4299.84	-222.59	0.46	-0.09	-0.45	542604.22	1705948.10	N 39 59 6.08	W 80 32 57.78	6.35
	11122.00	91.55	329.42	6669.22	5337.33	4208.84	4380.40	-270.95	0.85	0.13	0.84	542684.79	1705899.74	N 39 59 6.87	W 80 32 58.41	6.36
	11217.00	90.17	329.23	6667.79	5335.90	4302.18	4462.10	-319.41	1.47	-1.45	-0.20	542766.48	1705851.29	N 39 59 7.67	W 80 32 59.05	6.37
	11312.00	89.48	329.32	6668.09	5336.19	4395.62	4543.76	-367.95	0.73	-0.73	0.09	542848.14	1705802.75	N 39 59 8.47	W 80 32 59.68	6.38
	11407.00	89.63	328.15	6668.65	5336.76	4488.69	4624.96	-417.25	1.29	0.37	-1.23	542929.34	1705753.45	N 39 59 9.27	W 80 33 0.33	6.40
	11501.00	89.89	327.12	6668.88	5336.99	4580.51	4704.36	-467.57	1.10	0.06	-1.10	543008.73	1705703.13	N 39 59 10.05	W 80 33 0.99	6.41
	11596.00	89.34	326.47	6669.52	5337.63	4673.00	4783.85	-519.59	0.90	-0.58	-0.68	543088.21	1705651.11	N 39 59 10.83	W 80 33 1.67	6.42
	11690.00	89.51	326.75	6670.47	5338.58	4764.44	4862.33	-571.32	0.35	0.18	0.30	543166.69	1705599.39	N 39 59 11.60	W 80 33 2.34	6.43
	11785.00	89.49	326.68	6671.20	5339.40	4856.93	4941.83	-623.32	0.14	-0.02	0.14	543246.19	1705547.39	N 39 59 12.38	W 80 33 3.02	6.44
	11879.00	89.28	325.93	6672.30	5340.41	4948.29	5020.12	-675.33	1.03	-0.22	-1.01	543324.48	1705495.39	N 39 59 13.14	W 80 33 3.70	6.45
	11974.00	89.28	324.85	6673.50	5341.61	5040.21	5098.31	-729.28	1.14	0.00	-1.14	543402.66	1705441.44	N 39 59 13.91	W 80 33 4.41	6.46
	12068.00	89.57	324.71	6674.44	5342.55	5130.91	5175.09	-783.49	0.34	0.31	-0.15	543479.44	1705387.23	N 39 59 14.68	W 80 33 5.12	6.47
	12163.00	89.26	323.45	6675.41	5343.52	5222.26	5252.02	-839.22	1.37	-0.33	-1.33	543556.37	1705331.50	N 39 59 15.42	W 80 33 5.84	6.48
	12257.00	90.77	324.19	6675.39	5343.50	5312.54	5327.89	-894.70	1.79	1.61	0.79	543632.23	1705276.02	N 39 59 16.16	W 80 33 6.57	6.50
	12352.00	90.77	325.72	6674.11	5342.22	5404.27	5405.66	-949.25	1.61	0.00	1.61	543710.00	1705221.48	N 39 59 16.92	W 80 33 7.28	6.51
	12446.00	90.54	326.45	6673.03	5341.14	5495.51	5483.66	-1001.69	0.81	-0.24	0.78	543768.00	1705169.03	N 39 59 17.69	W 80 33 7.96	6.52
	12541.00	91.00	326.05	6671.76	5339.87	5587.78	5562.64	-1054.47	0.64	0.48	-0.42	543860.98	1705116.26	N 39 59 18.46	W 80 33 8.65	6.53
	12636.00	91.12	325.37	6670.00	5338.11	5679.82	5641.12	-1107.98	0.73	0.13	-0.72	543945.45	1705062.75	N 39 59 19.23	W 80 33 9.35	6.54
	12730.00	90.63	324.75	6668.57	5336.68	5770.64	5716.17	-1161.81	0.84	-0.52	-0.66	544022.49	1705008.92	N 39 59 19.99	W 80 33 10.06	6.55
	12824.00	89.46	325.69	6668.49	5336.60	5861.57	5795.46	-1215.29	1.74	-1.24	1.21	544099.79	1704955.44	N 39 59 20.74	W 80 33 10.78	6.56
	12919.00	89.94	327.40	6668.99	5337.10	5953.99	5874.61	-1267.52	1.67	0.51	1.59	544179.13	1704903.21	N 39 59 21.52	W 80 33 11.44	6.57
	13014.00	89.77	327.77	6669.23	5337.34	6046.77	5955.01	-1318.45	0.43	-0.18	0.39	544259.32	1704852.29	N 39 59 22.31	W 80 33 12.11	6.58
	13109.00	89.74	327.52	6669.63	5337.74	6138.60	6034.42	-1368.75	0.27	-0.03	-0.27	544338.73	1704801.99	N 39 59 23.09	W 80 33 12.76	6.59
	13203.00	89.66	327.22	6670.13	5338.24	6231.30	6114.42	-1419.98	0.33	-0.08	-0.32	544418.73	1704750.77	N 39 59 23.87	W 80 33 13.43	6.60
	13299.00	89.60	326.30	6670.74	5338.85	6323.77	6193.87	-1472.05	0.97	-0.06	-0.97	544493.18	1704698.70	N 39 59 24.65	W 80 33 14.11	6.61
	13392.00	89.57	325.27	6671.42	5339.53	6414.89	6271.60	-1524.90	1.10	-0.03	-1.10	544575.90	1704645.85	N 39 59 25.41	W 80 33 14.80	6.62
	13487.00	90.57	327.36	6671.31	5339.42	6507.19	6350.65	-1577.59	2.44	1.05	2.20	544654.94	1704593.16	N 39 59 26.19	W 80 33 15.49	6.63
	13582.00	89.91	328.42	6670.91	5339.02	6600.07	6431.11	-1628.09	1.31	-0.69	1.12	544735.41	1704542.67	N 39 59 26.98	W 80 33 16.15	6.64
	13676.00	89.63	327.71	6671.12	5339.23	6692.04	6510.88	-1677.81	0.76	-0.09	-0.76	544815.17	1704492.95	N 39 59 27.76	W 80 33 16.81	6.65
	13771.00	80.00	324.73	6672.09	5340.20	6784.29	6589.83	-1730.02	3.26	-0.87	-3.14	544894.12	1704440.14	N 39 59 28.53	W 80 33 17.50	6.66
	13866.00	90.06	324.79	6672.87	5340.98	6875.65	6667.42	-1785.43	1.12	1.12	0.06	544971.70	1704385.33	N 39 59 29.29	W 80 33 18.21	6.67
	13960.00	90.40	325.00	6672.49	5340.60	6968.70	6744.32	-1839.49	0.43	0.36	0.22	545048.60	1704331.28	N 39 59 30.05	W 80 33 18.92	6.68
	14055.00	90.29	321.06	6671.92	5340.03	7057.77	6820.66	-1896.01	3.20	-0.12	-3.20	545124.93	1704274.75	N 39 59 30.80	W 80 33 19.66	6.69
	14150.00	90.52	324.17	6671.25	5339.36	7148.64	6896.58	-1953.09	2.34	0.24	2.33	545200.88	1704217.67	N 39 59 31.54	W 80 33 20.40	6.70
	14244.00	91.00	325.56	6670.00	5338.11	7239.37	6973.45	-2007.19	1.56	0.51	1.48	545277.72	1704163.58	N 39 59 32.29	W 80 33 21.11	6.71
	14339.00	90.34	322.73	6668.69	5337.00	7330.74	7050.43	-2062.82	3.06	-0.69	-2.98	545354.70	1704107.95	N 39 59 33.05	W 80 33 21.83	6.72
	14434.00	91.43	322.81	6667.43	5335.54	7421.47	7126.06	-2120.29	1.15	1.15	0.08	545430.33	1704050.48	N 39 59 33.79	W 80 33 22.58	6.73

51-01661

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	TVDSS (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	BR (°/100ft)	TR (°/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ' ")	Longitude (E/W ° ' ")	Directional Difficulty Index
	14528.00	91.12	323.36	6665.33	5333.44	7511.38	7201.20	-2176.73	0.67	-0.33	0.59	545505.46	1703994.04	N 39 59 34.52	W 80 33 23.32	6.74
	14623.00	90.26	323.90	6664.19	5332.30	7602.52	7277.69	-2233.06	1.07	-0.91	0.57	545581.95	1703937.71	N 39 59 35.27	W 80 33 24.05	6.75
	14718.00	89.57	324.19	6664.33	5332.44	7693.88	7354.59	-2268.84	0.79	-0.73	0.31	545658.84	1703881.94	N 39 59 36.03	W 80 33 24.78	6.76
	14812.00	89.57	324.30	6665.04	5333.15	7784.33	7430.87	-2343.77	0.12	0.00	0.12	545735.12	1703827.02	N 39 59 36.77	W 80 33 25.50	6.77
	14907.00	89.66	324.04	6665.67	5333.78	7875.73	7507.89	-2399.38	0.29	0.09	-0.27	545812.14	1703771.41	N 39 59 37.53	W 80 33 26.23	6.77
	15002.00	90.09	325.99	6665.88	5333.99	7967.49	7585.72	-2453.84	2.10	0.45	2.05	545889.96	1703718.94	N 39 59 38.29	W 80 33 26.94	6.78
	15096.00	89.43	327.68	6666.28	5334.39	8059.02	7664.40	-2505.26	1.93	-0.70	1.80	545968.64	1703665.53	N 39 59 39.06	W 80 33 27.61	6.79
	15191.00	88.71	324.51	6667.82	5335.93	8151.21	7743.23	-2558.24	3.42	-0.76	-3.34	546047.46	1703612.55	N 39 59 39.84	W 80 33 28.30	6.81
	15286.00	90.74	323.20	6668.27	5336.38	8242.46	7819.04	-2614.27	2.54	2.14	-1.38	546124.17	1703556.52	N 39 59 40.59	W 80 33 29.03	6.82
	15380.00	90.49	322.05	6667.26	5335.37	8332.16	7894.63	-2671.33	1.25	-0.27	-1.22	546188.88	1703499.47	N 39 59 41.32	W 80 33 29.78	6.82
	15475.00	90.20	321.29	6666.69	5334.80	8422.34	7969.15	-2730.25	0.86	-0.31	-0.80	546273.38	1703440.56	N 39 59 42.05	W 80 33 30.55	6.83
	15569.00	90.09	322.35	6666.45	5334.56	8511.05	6043.04	-2788.35	1.13	-0.12	1.13	546347.27	1703382.45	N 39 59 42.77	W 80 33 31.30	6.84
	15664.00	92.49	324.32	6664.32	5332.43	8602.63	8119.21	-2845.06	3.27	2.53	2.07	546423.44	1703325.75	N 39 59 43.52	W 80 33 32.04	6.85
	15758.00	89.94	326.12	6662.32	5330.43	8693.49	8196.39	-2898.66	3.32	-2.71	1.91	546500.61	1703272.15	N 39 59 44.27	W 80 33 32.74	6.86
	15853.00	89.40	326.30	6662.87	5330.98	8785.75	8275.35	-2951.49	0.60	-0.57	0.19	546579.56	1703219.32	N 39 59 45.05	W 80 33 33.44	6.87
	15948.00	90.14	330.18	6663.25	5331.36	6878.74	8356.10	-3001.48	4.16	0.78	4.08	546660.32	1703169.33	N 39 59 45.84	W 80 33 34.09	6.88
	16042.00	89.14	330.09	6663.84	5331.95	8971.34	8437.62	-3048.29	1.07	-1.06	-0.10	546741.83	1703122.52	N 39 59 46.64	W 80 33 34.70	6.89
Final Survey 09-Dec-13	16073.00	88.88	329.03	6664.38	5332.49	9001.83	8464.34	-3063.99	3.52	-0.84	-3.42	546766.55	1703106.82	N 39 59 46.90	W 80 33 34.91	6.89
PTB	16108.00	88.88	329.03	6665.06	5333.17	9036.18	8494.35	-3082.00	0.00	0.00	0.00	546798.55	1703088.81	N 39 59 47.20	W 80 33 35.15	0.90

Survey Type: Def Survey

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

Survey Program:

Description	Part	MD From (ft)	MD To (ft)	EOU Freq (ft)	Hole Size (in)	Casing Diameter (in)	Survey Tool Type	Borehole / Survey
	1	0.000	22.710	Act Stns	30.000	30.000	SLB_NSG+MSHOT-Depth Only	Original Borehole / Noble Energy SHL-26D-HS Gyro+MWD 0ft to 16108ft MD
	1	22.710	3188.000	Act Stns	30.000	30.000	SLB_NSG+MSHOT	Original Borehole / Noble Energy SHL-26D-HS Gyro+MWD 0ft to
	1	3188.000	16073.000	Act Stns	30.000	30.000	SLB_MWD-STD	Original Borehole / Noble Energy SHL-26D-HS Gyro+MWD 0ft to
	1	16073.000	16108.000	Act Stns	30.000	30.000	SLB_BLIND+TREND	Original Borehole / Noble Energy SHL-26D-HS Gyro+MWD 0ft to

51-01661

51-01661

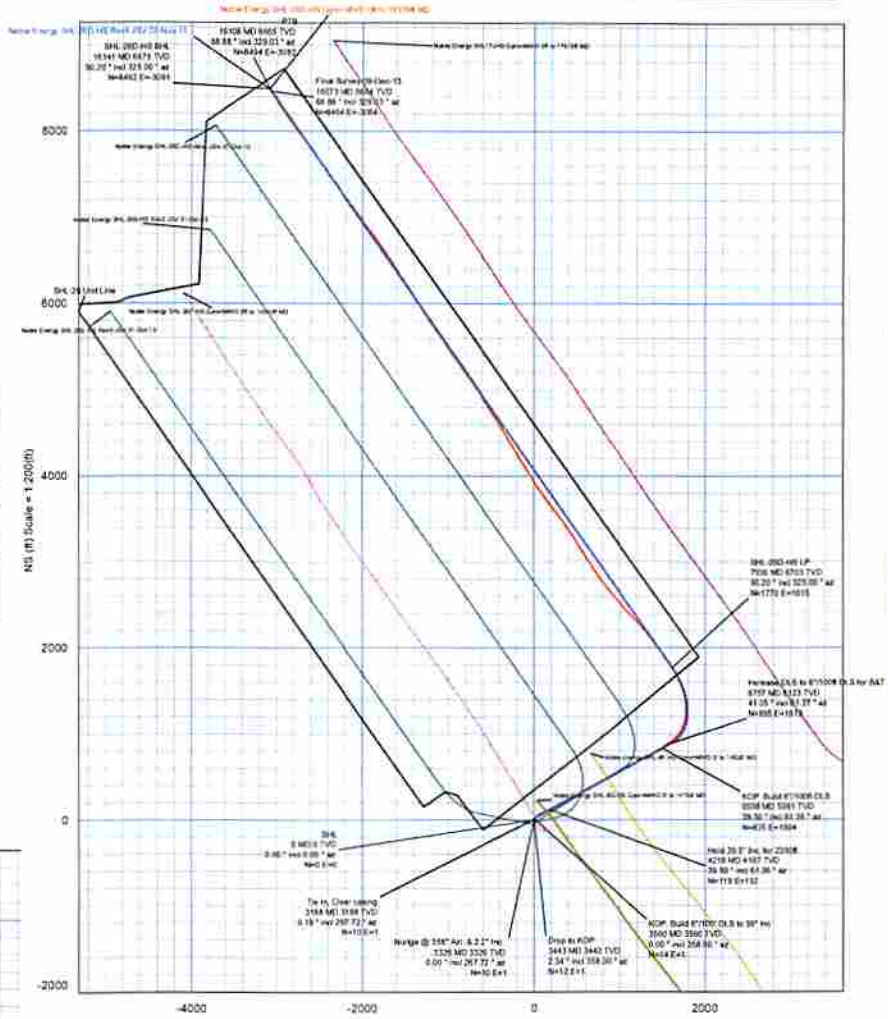
PATHFINDER
A Schlumberger Company

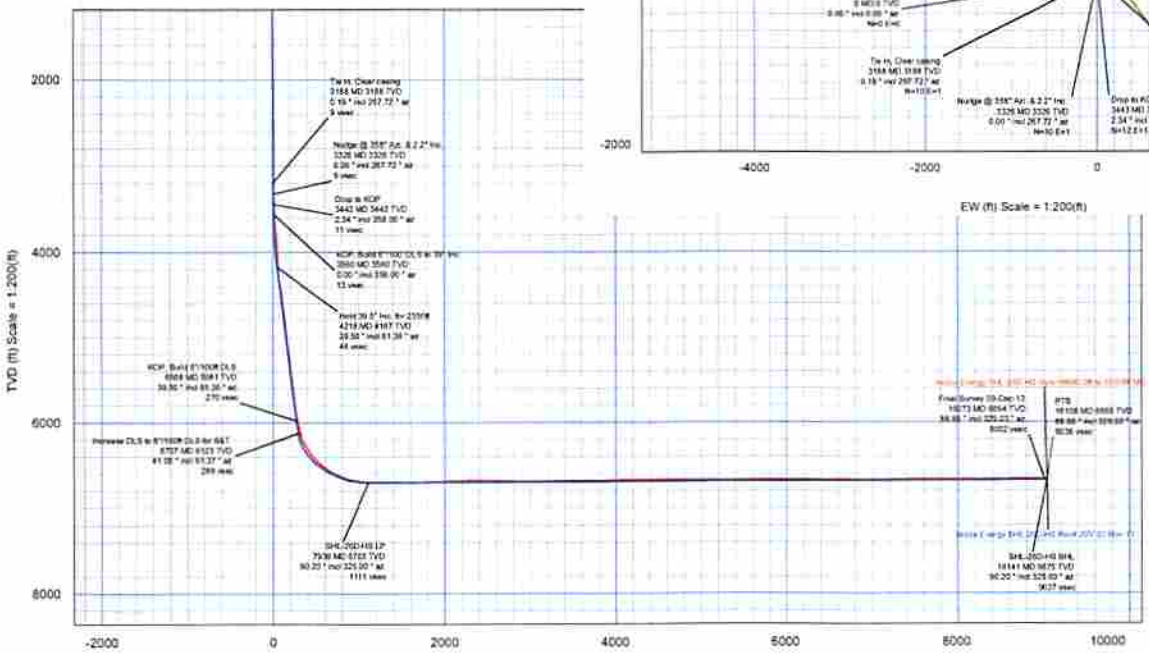
Noble Energy

noble energy

Borehole:	Well:	Field:	Structure:
Original Borehole	SHL-26D-HS	WV Marshall County (NAD 27)	Nabors M59

Gravity & Magnetic Parameters															
Model:	HDGM 2013	Dip:	67.516°	Date:	11/22/2013	Lat:	N 39 38 23.81	Northing:	538394.577ftUS	Grid Conv:	-0.669°	Slot:	SHL-26D-HS	TVD Ref:	KB(1331.8Mt above MSL)
MagDec:	-8.413°	FS:	53134.65nT	Gravity FS:	999.34mgn (9.80665 Based)	Lon:	W 80 32 54.27	Easting:	1794170.683ftUS	Scale Fact:	1	Plan:	Noble Energy SHL-26D-HS Gyro+MWD 0ft to 14108ft MD		





Vertical Section (ft) Azim = 339.997° Scale = 1:200(ft) Origin = 0N/-S, 0E/-W

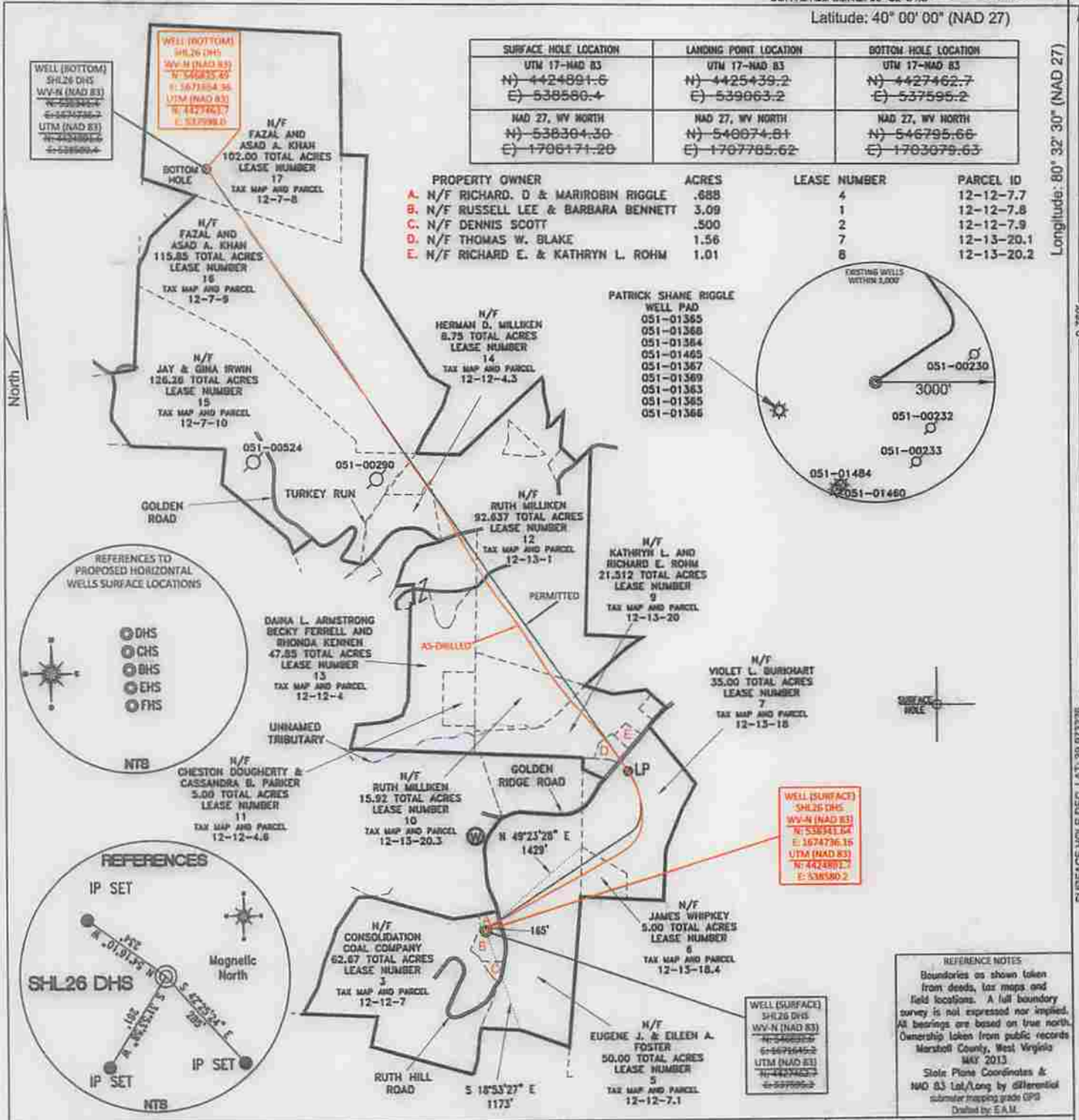
Grid North
Tot Corr (M->G -7.744°)
Mag Dec (-8.413°)
Grid Conv (-0.669°)

SURFACE HOLE DEC. LONG: 80.548408
SURVEYED LONG: 80° 32' 54.3" — 1,890'

Latitude: 40° 00' 00" (NAD 27)

SURFACE HOLE LOCATION	LANDING POINT LOCATION	BOTTOM HOLE LOCATION
UTM 17-NAD 83	UTM 17-NAD 83	UTM 17-NAD 83
~~N) 4424891.6~~	~~N) 4425439.2~~	~~N) 4427462.7~~
~~E) 538580.4~~	~~E) 539063.2~~	~~E) 537595.2~~
NAD 27, WV NORTH	NAD 27, WV NORTH	NAD 27, WV NORTH
~~N) 538304.30~~	~~N) 540074.81~~	~~N) 546795.66~~
~~E) 1706171.20~~	~~E) 1707785.62~~	~~E) 1703079.63~~

	PROPERTY OWNER	ACRES	LEASE NUMBER	PARCEL ID
A.	N/F RICHARD. D & MARIROBIN RIGGLE	.688	4	12-12-7.7
B.	N/F RUSSELL LEE & BARBARA BENNETT	3.09	1	12-12-7.8
C.	N/F DENNIS SCOTT	.500	2	12-12-7.9
D.	N/F THOMAS W. BLAKE	1.56	7	12-13-20.1
E.	N/F RICHARD E. & KATHRYN L. ROHM	1.01	8	12-13-20.2



REFERENCE NOTES
Boundaries as shown taken from deeds, tax maps and field locations. A full boundary survey is not expressed nor implied. All bearings are based on true north. Ownership taken from public records Marshall County, West Virginia MAY 2013
State Plane Coordinates & NAD 83 Lat/Long by differential submeter mapping grade GPS
Drafted by: E.A.M.

FILE #: NOB 002
DRAWING #: 2217
SCALE: PLAT - 1" = 1600' TICK MARK - 1" = 2000'
MINIMUM DEGREE OF ACCURACY: 1/200
PROVEN SOURCE OF ELEVATION: SUBMETER MAPPING GRADE GPS

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 DEPARTMENT OF ENVIRONMENTAL PROTECTION.

Signed:

L.L.S. #2124 : Ernest J. Benchek III

ERNEST J. BENCHEK III
LICENSED
No. 2124
STATE OF WEST VIRGINIA
PROFESSIONAL SURVEYOR

(+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS

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

DATE: AUGUST 8, 2014

OPERATOR'S WELL #: SHL26 DHS AS-DRILLED

API WELL #: 47 (STATE) 51 (COUNTY) 01661 (PERMIT)

Well Type: ☐ Oil ☐ Waste Diposal ☒ Production ☐ Deep
☒ Gas ☐ Liquid Injection ☐ Storage ☒ Shallow

WATERSHED: WHEELING CREEK
ELEVATION: 1,320'
COUNTY/DISTRICT: MARSHALL / SANDHILL
QUADRANGLE: MAJORSVILLE WV-PA
SURFACE OWNER: RUSSELL LEE AND BARBARA ANN BENNETT
ACREAGE: 3.09 +/-
OIL & GAS ROYALTY OWNER: JAMES O. WHIPKEY ET AL
ACREAGE: 695.298 +/-
LEASE NUMBERS:

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

TARGET FORMATION: MARCELLUS
ESTIMATED DEPTH: TVD: 6,698' TMD: 16,052'
WELL OPERATOR: NOBLE ENERGY, INC.
DESIGNATED AGENT: STEVEN M. GREEN
ADDRESS: 333 TECHNOLOGY DRIVE SUITE 116
ADDRESS: 500 VIRGINIA STREET EAST
CITY: CANONSBURG STATE: PA ZIP CODE: 15317
CITY: CHARLESTON STATE: WV ZIP CODE: 25301

SURFACE HOLE DEC. LONG: 80.548408
SURVEYED LONG: 80° 32' 54.3"

Latitude: 40° 00' 00" (NAD 27)

Longitude: 80° 32' 30" (NAD 27)

SURFACE HOLE LOCATION	LANDING POINT LOCATION	BOTTOM HOLE LOCATION
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~~E) 538580.4~~	~~E) 539063.2~~	~~E) 537595.2~~
NAD 27, WV NORTH	NAD 27, WV NORTH	NAD 27, WV NORTH
~~N) 538394.39~~	~~N) 548074.81~~	~~N) 546795.66~~
~~E) 1706171.20~~	~~E) 1707785.62~~	~~E) 1703079.63~~

PROPERTY OWNER	ACRES	LEASE NUMBER	PARCEL ID
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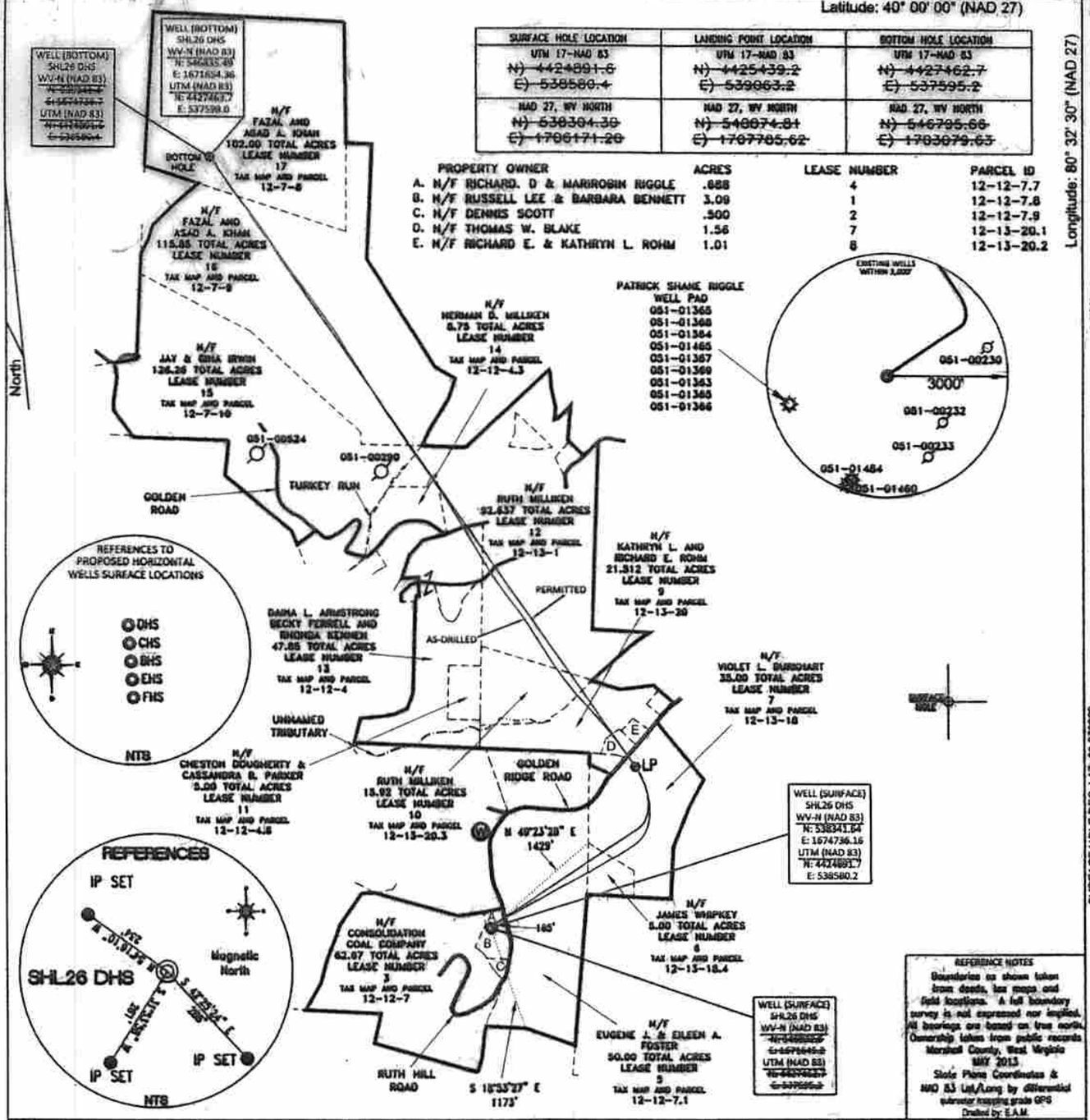
C. H/F DENNIS SCOTT	.500	2	12-12-7.9
D. H/F THOMAS W. BLAKE	1.56	7	12-13-20.1
E. H/F RICHARD E. & KATHRYN L. ROHM	1.01	8	12-13-20.2



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Drafted by: E.A.M.

FILE #: NOB 002
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SCALE: PLAT - 1" = 1600' TICK MARK - 1" = 2000'
MINIMUM DEGREE OF ACCURACY: 1/200
PROVEN SOURCE OF ELEVATION: SUBMETER MAPPING GRADE GPS

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 DEPARTMENT OF ENVIRONMENTAL PROTECTION.

Signed:

L.L.S. #2124 : Ernest J. Benchek III

ERNEST J. BENCHEK III LICENSED No. 2124 STATE OF WEST VIRGINIA PROFESSIONAL SURVEYOR

(+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS

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

DATE: AUGUST 8, 2014

OPERATOR'S WELL #: SHL26 DHS AS-DRILLED

API WELL #: 47 (STATE) 51 (COUNTY) 01661 (PERMIT)

Well Type: ☐ Oil ☐ Waste Diposal ☒ Production ☐ Deep
☒ Gas ☐ Liquid Injection ☐ Storage ☒ Shallow

WATERSHED: WHEELING CREEK
ELEVATION: 1,320'
COUNTY/DISTRICT: MARSHALL / SANDHILL
QUADRANGLE: MAJORSVILLE WV-PA
SURFACE OWNER: RUSSELL LEE AND BARBARA ANN BENNETT
ACREAGE: 3.09 +/-
OIL & GAS ROYALTY OWNER: JAMES O. WHIPKEY ET AL
ACREAGE: 695.298 +/-
LEASE NUMBERS:

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

TARGET FORMATION: MARCELLUS
ESTIMATED DEPTH: TVD: 6,698' TMD: 16,052'
WELL OPERATOR: NOBLE ENERGY, INC.
DESIGNATED AGENT: STEVEN M. GREEN
ADDRESS: 333 TECHNOLOGY DRIVE SUITE 116
ADDRESS: 500 VIRGINIA STREET EAST
CITY: CANONSBURG STATE: PA ZIP CODE: 15317
CITY: CHARLESTON STATE: WV ZIP CODE: 25301