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 - 01762 County Marshall District Franklin
Quad Powhatan Point Pad Name MND 06 Field/Pool Name N/A
Farm name Consolidated Coal Company Well Number MND 06 FHS
Operator (as registered with the OOG) Noble Energy, Inc.
Address 1000 Noble Energy Drive 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 39.817676 Easting 80.791779
Landing Point of Curve Northing 39.816473 Easting 80.798056
Bottom Hole Northing 39.834082 Easting 80.814544

Elevation (ft) 722' 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 X 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

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Date permit issued 06/10/2014 Date drilling commenced 08/28/2014 Date drilling ceased 12/11/2014
Date completion activities began 03/06/2017 Date completion activities ceased 04/11/2017
Verbal plugging (Y/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 128' and 265' Open mine(s) (Y/N) depths N
Salt water depth(s) ft none noted for offsets Void(s) encountered (Y/N) depths N-drilled in pillar
Coal depth(s) ft 284' - 294' Cavern(s) encountered (Y/N) depths N
Is coal being mined in area (Y/N) No

Reviewed
2/7/18

Reviewed by:

WR-35
Rev. 8/23/13

Page ___ of ___

API 47- 051 - 01762 Farm name Consolidated Coal Company Well number MND 06 FHS

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	26"	20"	40'	New	DH-36		Y
Surface	18"	16"	135'	New	H-40		Y
Coal	17.5"	13 3/8"	726'	New	J-55		N
Intermediate 1	12.38"	9 5/8"	2033'	New	HCK-55		Y
Intermediate 2							
Intermediate 3							
Production	8-3/4" & 8-1/2"	5 1/2"	14,634.9'	New	P-110		Y
Tubing							
Packer type and depth set							

Comment Details was unable to displace cement out of the hole do to pressure exceeding 1000 psi and pumping casing up hole 3".

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	CaCl 1.15					0	8
Surface	CaCl 1.15					0	8
Coal	Type 1 / Class A	490	15.6	1.39	681.1	0	8
Intermediate 1	Type 1 / Class A	745	15.6	1.18	879.1	0	8
Intermediate 2							
Intermediate 3							
Production	Type 1 / Class A	lead 718 tail 2250	14.8	Lead 1.54 tail 1.37	total 4,490.99	1815.0	8
Tubing							

Drillers TD (ft) 14650.00 Loggers TD (ft) 14,627.00

Deepest formation penetrated Marcellus Plug back to (ft) ___

Plug back procedure ___

Kick off depth (ft) 5500

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

Well cored ☐ Yes ☐ No Conventional Sidewall Were cuttings collected ☐ Yes ☐ No

DESCRIBE THE CENTRALIZER PLACEMENT USED FOR EACH CASING STRING No centralizers used on conductor.
18 Centralizers on Intermediate String (Bow string centralizers on first two joints then every third joint to 100' from surface).
248 Centralizers on Production String (rigid bow string every joint to KOP, rigid bow spring every third joint from KOP to top of cement).

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 ___

WR-35
Rev. 8/23/13

API 47- 051 - 01762 Farm name Consolidated Coal Company Well number MND 06 FHS

PERFORATION RECORD

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

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)
								See attached

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Please insert additional pages as applicable.

Frac Wellbore Schematic Report

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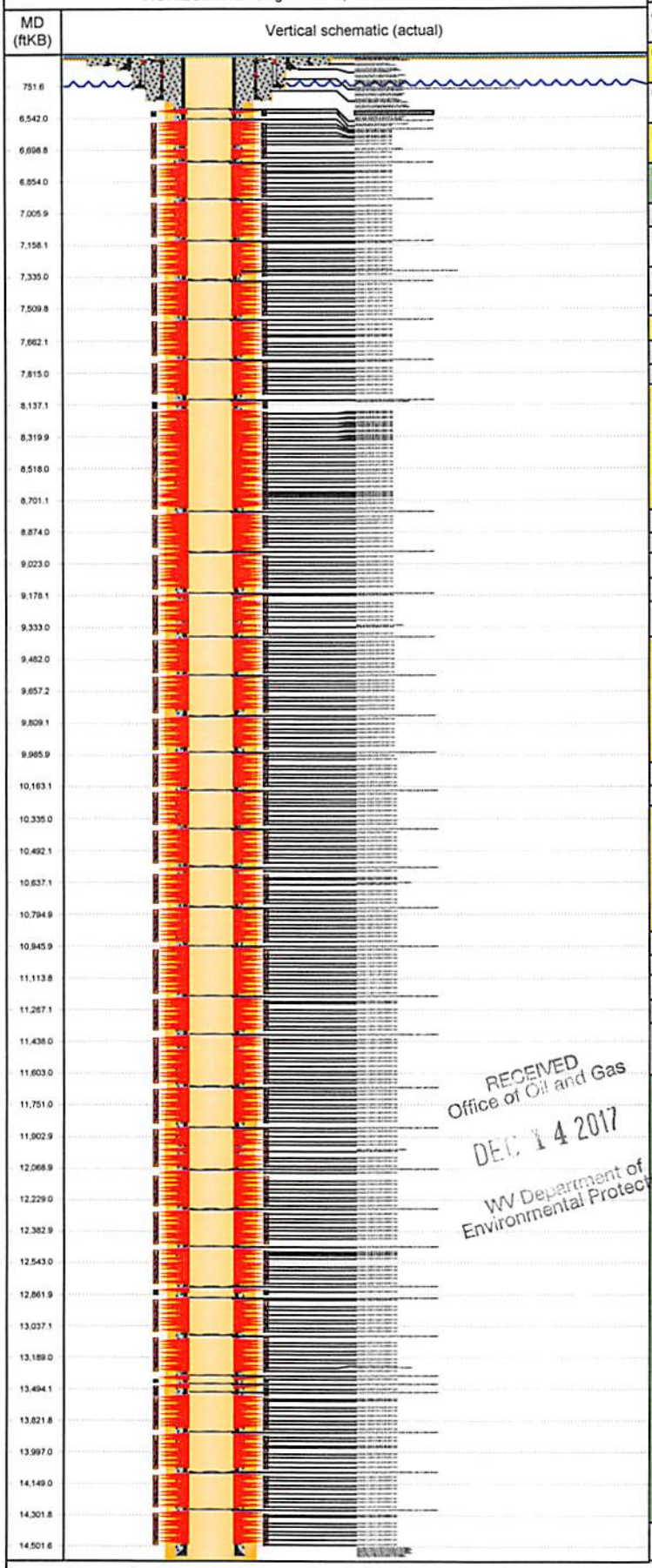
Well Name: MND-6F-HS

HORIZONTAL - Original Hole, 12/11/2017 3:05:48 PM



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Well Header

API	Business Unit	District	Well Config
47-051-01762	MARCELLUS	30	HORIZONTAL
Original KB Elevation (ft)	**KB - GL / MSL (ftKB)**	**Spud Date**	**P & A Date**
748	25.90	8/28/2014	

Comment

Directions To Well

Current PBTD (mKB)

Bottom Hole Location

North-South Distance (ft)	From N or S Line	East-West Distance (ft)	From E or W Line

Plug Back Total Depths

Date	Depth (ftKB)	Method	Com

Wellbore Sections

Section Des	Size (in)	Act Top, MD (ftKB)	Act Btm, MD (ftKB)
CONDUCTOR 1	24	26	40
CONDUCTOR 2	18	40	140
SURFACE	14 3/4	140	764
INTERMEDIATE	12 1/4	764	2,070
PRODUCTION	8 3/4	2070	14,650

Zone Statuses

Zone Name	Status Date	Status	Fluid Type	Job	Prod Method

Casing Strings

Csg Des	Run Date	OD (in)	Wt/Len (lb/ft)	Grade	Top, MD (ftKB)	MD (ftKB)
Conductor	8/24/2014	20	726.00	X-70	25.9	40.0
Conductor	8/26/2014	16	65.00	H-40	25.9	135.0
Surface	8/28/2014	13 3/8	54.50	K-55	25.9	753.2
Intermediate	12/2/2014	9 5/8	36.00	HCK-55	25.9	2,060.4
Production	12/9/2014	5 1/2	23.00	P-110	25.9	14,634.9

Cement

Des	Top (ftKB)	Btm (ftKB)
Conductor Cement	25.9	40.0
Conductor Cement	25.9	135.0
Surface Casing Cement	25.9	753.2
Intermediate Casing Cement	25.9	2,060.4
Production Casing Cement	0.0	14,634.9

Tubing Components

Item Des	OD (in)	Wt (lb/ft)	Grade	Jts	Len (ft)

Perforation Data

Linked Zone	Bnch/Stg	Sum of Entered Shot Total	Top (ftKB)	Btm (ftKB)	Date
MARCELLUS, Original Hole	40	58	6,350.00	6,527.00	4/9/2017
	39	58	6,552.00	6,729.00	4/9/2017
	38	58	6,754.00	6,931.00	4/8/2017
	37	58	6,960.00	7,133.00	4/8/2017
	36	58	7,157.00	7,331.00	4/8/2017
	35	58	7,360.00	7,537.00	4/7/2017
	34	58	7,564.00	7,739.00	4/6/2017
	33	58	7,763.00	7,942.00	4/6/2017
	32	58	7,966.00	8,139.00	4/2/2017
	31	58	8,168.00	8,345.00	4/2/2017
	30	58	8,370.00	8,547.00	4/2/2017
	29	58	8,572.00	8,749.00	4/2/2017
	28	58	8,774.00	8,952.00	4/1/2017
	27	58	8,976.00	9,152.00	4/1/2017
	26	58	9,178.00	9,355.00	4/1/2017
	25	58	9,380.00	9,557.00	3/31/2017
	24	58	9,582.00	9,754.00	3/31/2017
	23	58	9,784.00	9,959.00	3/31/2017

Report Printed: 12/11/2017

Frac Wellbore Schematic Report

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Well Name: MND-6F-HS

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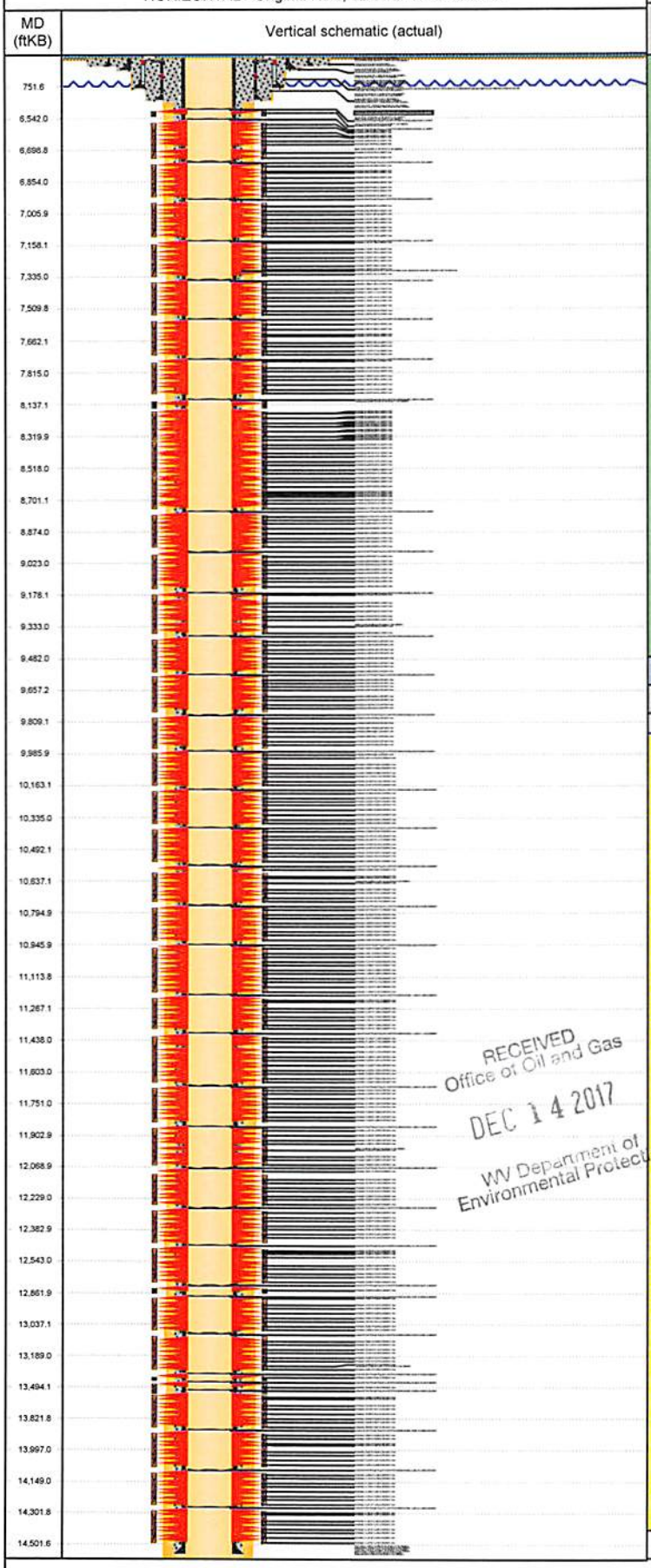

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Perforation Data

Linked Zone	Bnch/Stg	Sum of Entered Shot Total	Top (ftKB)	Btm (ftKB)	Date
	22	58	9,986.00	10,163.00	3/30/2017
	21	58	10,188.00	10,365.00	3/30/2017
	20	58	10,390.00	10,567.00	3/30/2017
	19	58	10,590.00	10,748.00	3/29/2017
	18	58	10,773.00	10,929.00	3/29/2017
	17B	28	10,996.00	10,954.00	3/29/2017
	17A	58	11,014.00	11,191.00	3/28/2017
	16	58	11,216.00	11,393.00	3/28/2017
	15B	28	11,418.00	11,460.00	3/28/2017
	15A	58	11,478.00	11,650.00	3/27/2017
	14	58	11,675.00	11,850.00	3/27/2017
	13	58	11,877.00	12,054.00	3/27/2017
	12	58	12,074.00	12,256.00	3/26/2017
	11	58	12,281.00	12,453.00	3/26/2017
	10	58	12,483.00	12,660.00	3/26/2017
	9	58	12,685.00	12,862.00	3/26/2017
	8	58	12,887.00	13,064.00	3/25/2017
	7	58	13,091.00	13,266.00	3/25/2017
	6	58	13,290.00	13,470.00	3/25/2017
	5	58	13,493.00	13,665.00	3/24/2017
	4	58	13,695.00	13,872.00	3/24/2017
	3	58	14,069.00	13,897.00	3/24/2017
	2	58	14,099.00	14,276.00	3/23/2017
	1	58	14,301.00	14,478.00	3/23/2017
Total (Sum)		**2,376**			

Other In Hole

Run Date	Des	OD (in)	Top (ftKB)	Btm (ftKB)
3/23/2017	Composite Flow Through Plug (HALLIBURTON OBSIDIA...	4.37	14,291.0	14,293.0
3/24/2017	Composite Flow Through Plug (HALLIBURTON OBSIDIA...	4.37	14,084.0	14,086.0
3/24/2017	Composite Flow Through Plug (HALLIBURTON OBSIDIA...	4.37	13,887.0	13,889.0
3/24/2017	Composite Flow Through Plug (HALLIBURTON OBSIDIA...	4.37	13,663.0	13,665.0
3/25/2017	Composite Flow Through Plug (HALLIBURTON OBSIDIA...	4.37	13,468.0	13,470.0
3/25/2017	Composite Flow Through Plug (HALLIBURTON OBSIDIA...	4.37	13,281.0	13,283.0
3/25/2017	Composite Flow Through Plug (HALLIBURTON OBSIDIA...	4.37	13,079.0	13,081.0
3/26/2017	Composite Flow Through Plug (HALLIBURTON OBSIDIA...	4.37	12,877.0	12,879.0
3/26/2017	Composite Flow Through Plug (HALLIBURTON OBSIDIA...	4.37	12,675.0	12,677.0
3/26/2017	Composite Flow Through Plug (HALLIBURTON OBSIDIA...	4.37	12,473.0	12,475.0
3/26/2017	Composite Flow Through Plug (HALLIBURTON OBSIDIA...	4.37	12,271.0	12,273.0
3/27/2017	Composite Flow Through Plug (HALLIBURTON OBSIDIA...	4.37	12,069.0	12,071.0
3/27/2017	Composite Flow Through Plug (HALLIBURTON OBSIDIA...	4.37	11,867.0	11,869.0
3/27/2017	Composite Flow Through Plug (HALLIBURTON OBSIDIA...	4.37	11,665.0	11,667.0
3/28/2017	Composite Flow Through Plug (HALLIBURTON OBSIDIA...	4.37	11,408.0	11,410.0
3/28/2017	Composite Flow Through Plug (HALLIBURTON OBSIDIA...	4.37	11,206.0	11,208.0
3/29/2017	Composite Flow Through Plug (HALLIBURTON OBSIDIA...	4.37	10,944.0	10,946.0
3/29/2017	Composite Flow Through Plug (HALLIBURTON OBSIDIA...	4.37	10,766.0	10,768.0
3/30/2017	Composite Flow Through Plug (HALLIBURTON OBSIDIA...	4.37	10,582.0	10,584.0
3/30/2017	Composite Flow Through Plug (HALLIBURTON OBSIDIA...	4.37	10,380.0	10,382.0
3/30/2017	Composite Flow Through Plug (HALLIBURTON OBSIDIA...	4.37	10,180.0	10,182.0
3/31/2017	Composite Flow Through Plug (HALLIBURTON OBSIDIA...	4.37	9,976.0	9,978.0
3/31/2017	Composite Flow Through Plug (HALLIBURTON OBSIDIA...	4.37	9,774.0	9,776.0
3/31/2017	Composite Flow Through Plug (HALLIBURTON OBSIDIA...	4.37	9,572.0	9,574.0
4/1/2017	Composite Flow Through Plug (HALLIBURTON OBSIDIA...	4.37	9,370.0	9,372.0
4/1/2017	Composite Flow Through Plug (HALLIBURTON OBSIDIA...	4.37	9,168.0	9,170.0
4/1/2017	Composite Flow Through Plug (HALLIBURTON OBSIDIA...	4.37	8,966.0	8,968.0
4/2/2017	Composite Flow Through Plug (HALLIBURTON OBSIDIA...	4.37	8,764.0	8,766.0
4/6/2017	Composite Flow Through Plug (HALLIBURTON OBSIDIA...	4.37	7,956.0	7,958.0
4/6/2017	Composite Flow Through Plug (HALLIBURTON OBSIDIA...	4.37	7,754.0	7,756.0
4/7/2017	Composite Flow Through Plug (HALLIBURTON OBSIDIA...	4.37	7,552.0	7,554.0
4/8/2017	Composite Flow Through Plug (HALLIBURTON OBSIDIA...	4.37	7,346.0	7,348.0

Report Printed: 12/11/2017

Frac Wellbore Schematic Report

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Well Name: MND-6F-HS

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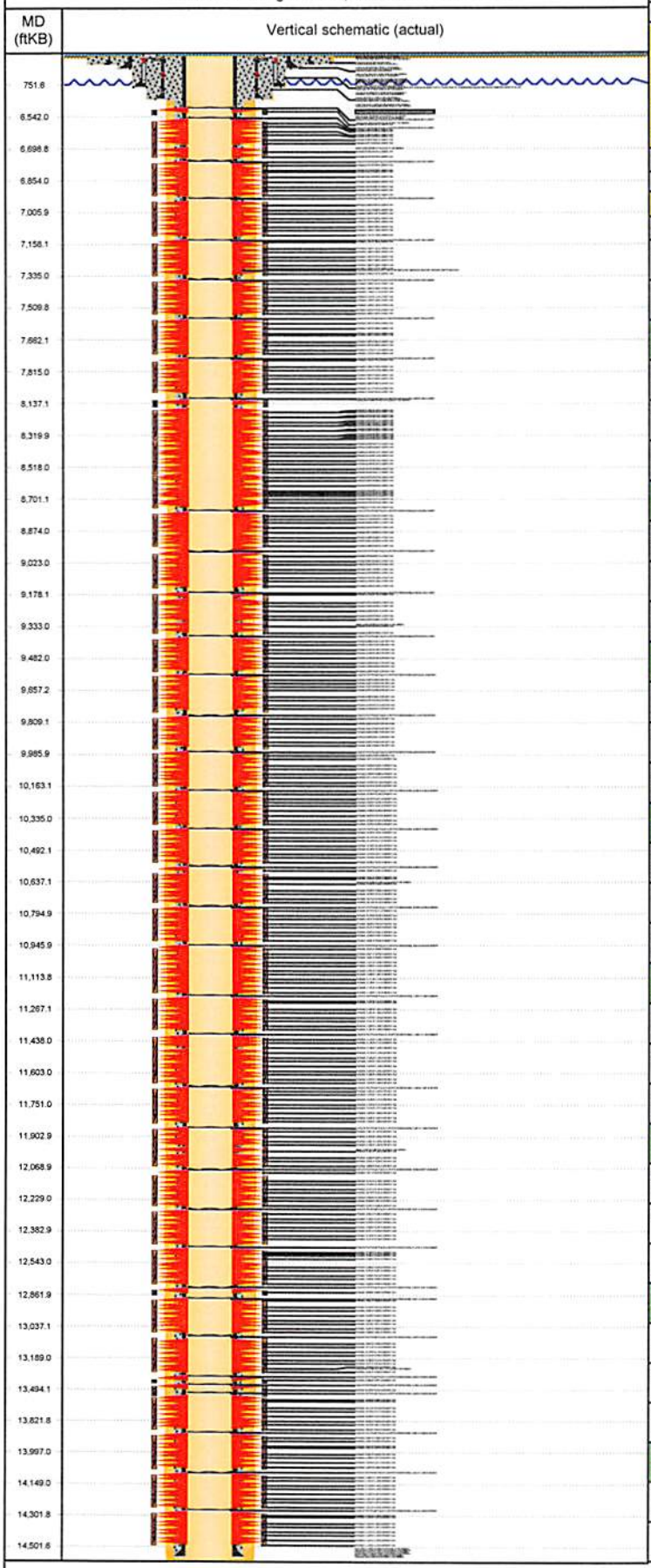


Other In Hole

Run Date	Des	OD (in)	Top (ftKB)	Btm (ftKB)
4/8/2017	Composite Flow Through Plug (HALLIBURTON OBSIDIA...	4.37	7,148.0	7,150.0
4/8/2017	Composite Flow Through Plug (HALLIBURTON OBSIDIA...	4.37	6,946.0	6,948.0
4/9/2017	Composite Flow Through Plug (HALLIBURTON OBSIDIA...	4.37	6,744.0	6,746.0
4/9/2017	Composite Flow Through Plug (HALLIBURTON OBSIDIA...	4.37	6,542.0	6,544.0
4/9/2017	Composite Flow Through Plug (HALLIBURTON OBSIDIA...	4.37	5,985.0	5,987.0

Logs

Date	Type	Top, MD (ftKB)	Btm, MD (ftKB)

Stimulation Intervals

Bnch/Stg	Start Date	Primary Job Type
	3/6/2017	COMPLETION - ORIGINAL

Comment: # of Clusters = 8, # of Shots = 58

Volume Slurry Total (gal): 39,211.20

Treat Pressure Avg (psi)	Treat Pressure Max (psi)	Slurry Rate Avg (bbl/min)	Slurry Rate Max (bbl/min)
7,892.0	9,889.0	19.7	33.8

Bnch/Stg	Start Date	Primary Job Type
	3/23/2017	COMPLETION - ORIGINAL

Comment: # of Clusters = 8, # of Shots = 58

Volume Slurry Total (gal): 12,028.80

Treat Pressure Avg (psi)	Treat Pressure Max (psi)	Slurry Rate Avg (bbl/min)	Slurry Rate Max (bbl/min)
6,227.0	7,509.0	12.6	20.1

Bnch/Stg	Start Date	Primary Job Type
	3/23/2017	COMPLETION - ORIGINAL

Comment: # of Clusters = 8, # of Shots = 58

Volume Slurry Total (gal): 850,311.00

Treat Pressure Avg (psi)	Treat Pressure Max (psi)	Slurry Rate Avg (bbl/min)	Slurry Rate Max (bbl/min)
8,088.0	9,012.0	84.6	85.8

Bnch/Stg	Start Date	Primary Job Type
	3/23/2017	COMPLETION - ORIGINAL

Comment: # of Clusters = 8, # of Shots = 58

Volume Slurry Total (gal): 763,198.80

Treat Pressure Avg (psi)	Treat Pressure Max (psi)	Slurry Rate Avg (bbl/min)	Slurry Rate Max (bbl/min)
8,516.0	10,356.0	85.7	93.6

Bnch/Stg	Start Date	Primary Job Type
	3/24/2017	COMPLETION - ORIGINAL

Comment: # of Clusters = 8, # of Shots = 58

Volume Slurry Total (gal): 758,402.40

Treat Pressure Avg (psi)	Treat Pressure Max (psi)	Slurry Rate Avg (bbl/min)	Slurry Rate Max (bbl/min)
8,390.0	9,662.0	84.9	85.6

Bnch/Stg	Start Date	Primary Job Type
	3/24/2017	COMPLETION - ORIGINAL

Comment: # of Clusters = 8, # of Shots = 58

Volume Slurry Total (gal): 742,723.80

Treat Pressure Avg (psi)	Treat Pressure Max (psi)	Slurry Rate Avg (bbl/min)	Slurry Rate Max (bbl/min)
7,975.0	9,440.0	85.0	85.5

Bnch/Stg	Start Date	Primary Job Type
	3/24/2017	COMPLETION - ORIGINAL

Comment: # of Clusters = 8, # of Shots = 58

Volume Slurry Total (gal): 748,889.40

Treat Pressure Avg (psi)	Treat Pressure Max (psi)	Slurry Rate Avg (bbl/min)	Slurry Rate Max (bbl/min)
7,978.0	9,908.0	90.0	90.5

Bnch/Stg	Start Date	Primary Job Type
	3/25/2017	COMPLETION - ORIGINAL

Comment: # of Clusters = 8, # of Shots = 58

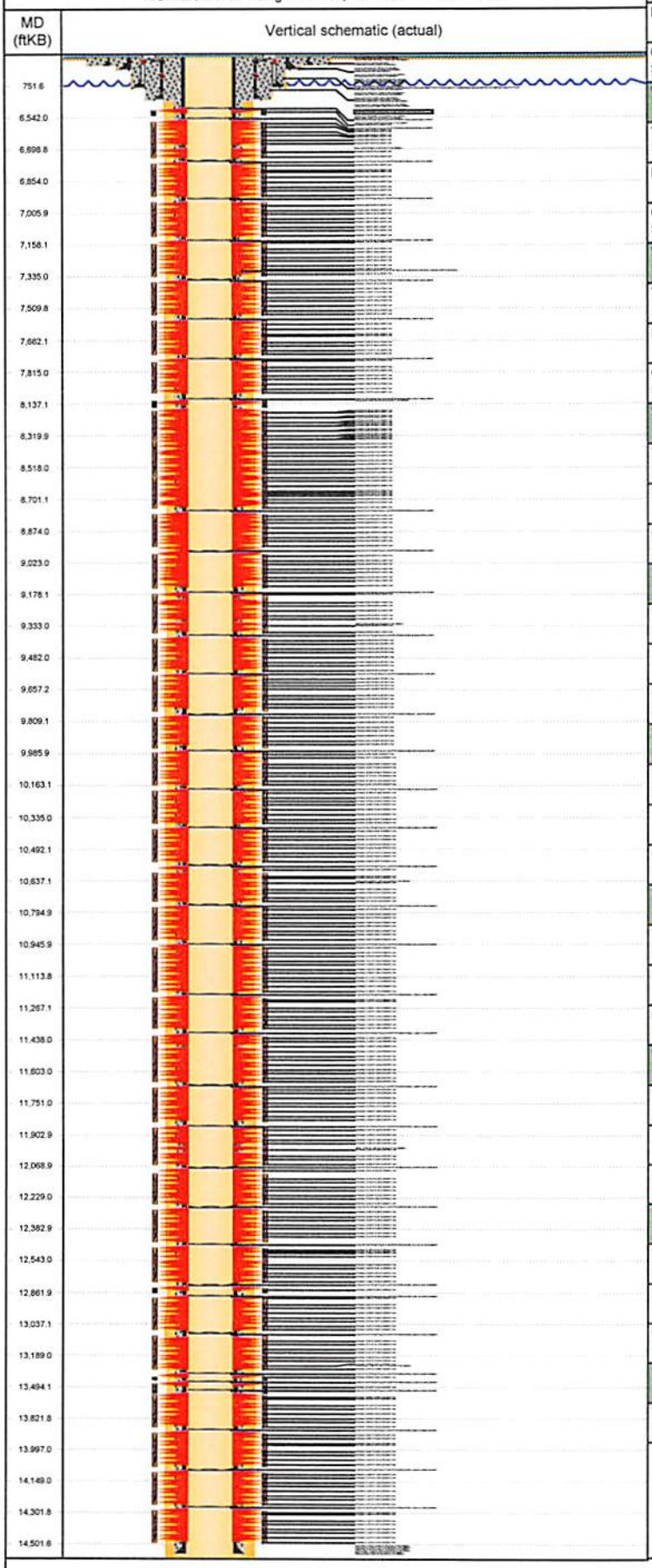
Volume Slurry Total (gal): 744,445.80

Treat Pressure Avg (psi)	Treat Pressure Max (psi)	Slurry Rate Avg (bbl/min)	Slurry Rate Max (bbl/min)
7,855.0	8,239.0	90.6	92.6

Frac Wellbore Schematic Report

Well Name: MND-6F-HS

HORIZONTAL - Original Hole, 12/11/2017 3:05:53 PM



Stimulation Intervals

Bnch/Stg	Start Date	Primary Job Type
	3/25/2017	COMPLETION - ORIGINAL

Comment: # of Clusters = 8, # of Shots = 58

Volume Slurry Total (gal)			
793,086.00			
Treat Pressure Avg (psi)	Treat Pressure Max (psi)	Slurry Rate Avg (bbl/min)	Slurry Rate Max (bbl/min)
7,887.0	9,716.0	85.7	86.7

Bnch/Stg	Start Date	Primary Job Type
	3/25/2017	COMPLETION - ORIGINAL

Comment: # of Clusters = 8, # of Shots = 58

Volume Slurry Total (gal)			
736,083.60			
Treat Pressure Avg (psi)	Treat Pressure Max (psi)	Slurry Rate Avg (bbl/min)	Slurry Rate Max (bbl/min)
8,081.0	9,711.0	86.8	90.7

Bnch/Stg	Start Date	Primary Job Type
	3/26/2017	COMPLETION - ORIGINAL

Comment: # of Clusters = 8, # of Shots = 58

Volume Slurry Total (gal)			
738,658.20			
Treat Pressure Avg (psi)	Treat Pressure Max (psi)	Slurry Rate Avg (bbl/min)	Slurry Rate Max (bbl/min)
8,542.0	9,560.0	90.1	91.0

Bnch/Stg	Start Date	Primary Job Type
	3/26/2017	COMPLETION - ORIGINAL

Comment: # of Clusters = 8, # of Shots = 58

Volume Slurry Total (gal)			
771,800.40			
Treat Pressure Avg (psi)	Treat Pressure Max (psi)	Slurry Rate Avg (bbl/min)	Slurry Rate Max (bbl/min)
8,315.0	10,265.0	85.1	90.0

Bnch/Stg	Start Date	Primary Job Type
	3/26/2017	COMPLETION - ORIGINAL

Comment: # of Clusters = 8, # of Shots = 58

Volume Slurry Total (gal)			
744,655.80			
Treat Pressure Avg (psi)	Treat Pressure Max (psi)	Slurry Rate Avg (bbl/min)	Slurry Rate Max (bbl/min)
7,773.0	9,982.0	88.3	90.7

Bnch/Stg	Start Date	Primary Job Type
	3/26/2017	COMPLETION - ORIGINAL

Comment: # of Clusters = 8, # of Shots = 58

Volume Slurry Total (gal)			
748,074.60			
Treat Pressure Avg (psi)	Treat Pressure Max (psi)	Slurry Rate Avg (bbl/min)	Slurry Rate Max (bbl/min)
7,725.0	9,283.0	90.0	93.4

Bnch/Stg	Start Date	Primary Job Type
	3/27/2017	COMPLETION - ORIGINAL

Comment: # of Clusters = 8, # of Shots = 58

Volume Slurry Total (gal)			
748,074.60			
Treat Pressure Avg (psi)	Treat Pressure Max (psi)	Slurry Rate Avg (bbl/min)	Slurry Rate Max (bbl/min)
7,728.0	8,466.0	86.5	90.7

Bnch/Stg	Start Date	Primary Job Type
	3/27/2017	COMPLETION - ORIGINAL

Comment: # of Clusters = 8, # of Shots = 58

Volume Slurry Total (gal)			
735,504.00			
Treat Pressure Avg (psi)	Treat Pressure Max (psi)	Slurry Rate Avg (bbl/min)	Slurry Rate Max (bbl/min)
7,986.0	9,216.0	88.7	92.0

Bnch/Stg	Start Date	Primary Job Type
	3/27/2017	COMPLETION - ORIGINAL

Comment: # of Clusters = 8, # of Shots = 58

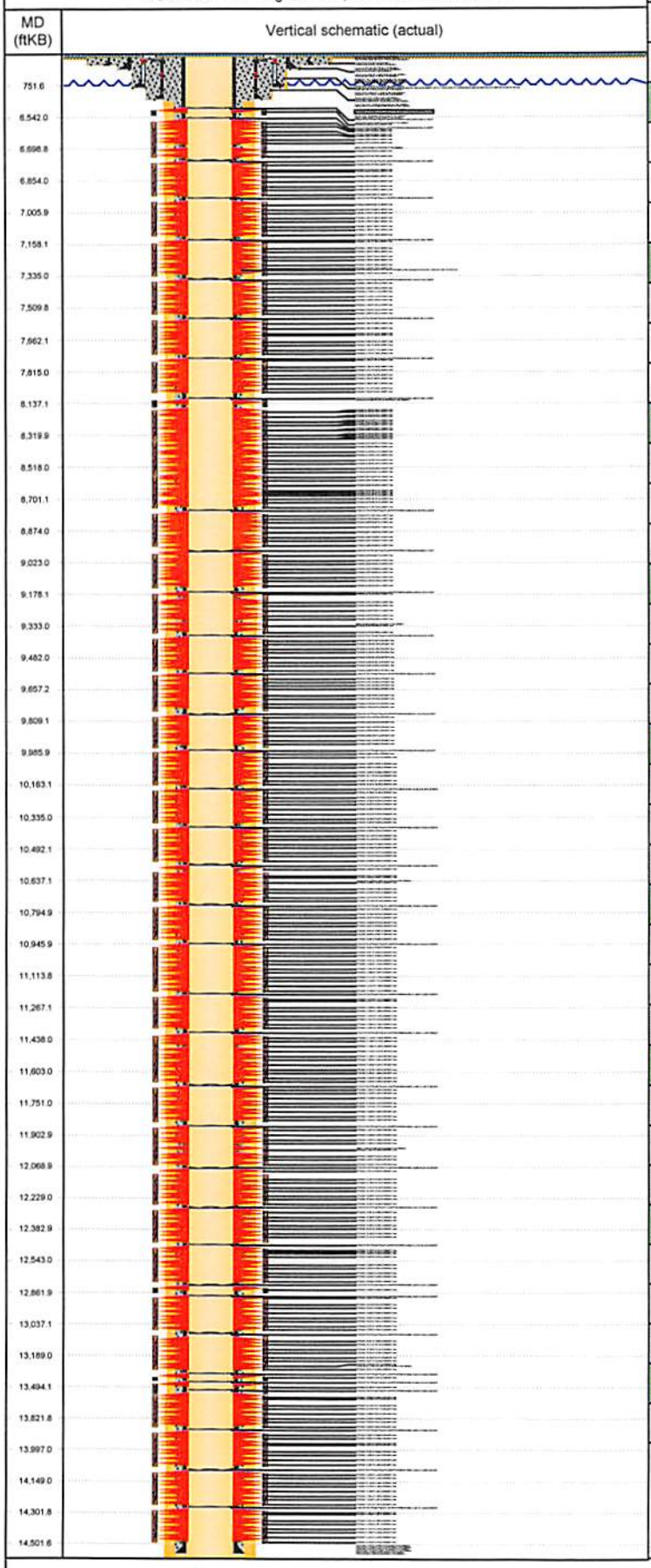
Volume Slurry Total (gal)			
116,739.00			
Treat Pressure Avg (psi)	Treat Pressure Max (psi)	Slurry Rate Avg (bbl/min)	Slurry Rate Max (bbl/min)
8,919.0	11,433.0	89.2	90.2

Frac Wellbore Schematic Report

noble energy

Well Name: MND-6F-HS

HORIZONTAL - Original Hole, 12/11/2017 3:05:55 PM



Stimulation Intervals

Bnch/Stg	Start Date	Primary Job Type
	3/28/2017	COMPLETION - ORIGINAL

Comment: # of Clusters = 8, # of Shots = 58

Volume Slurry Total (gal)			
959,964.60			
Treat Pressure Avg (psi)	Treat Pressure Max (psi)	Slurry Rate Avg (bbl/min)	Slurry Rate Max (bbl/min)
7,898.0	10,560.0	65.6	84.0

Bnch/Stg	Start Date	Primary Job Type
	3/28/2017	COMPLETION - ORIGINAL

Comment: # of Clusters = 8, # of Shots = 58

Volume Slurry Total (gal)			
1,055,796.00			
Treat Pressure Avg (psi)	Treat Pressure Max (psi)	Slurry Rate Avg (bbl/min)	Slurry Rate Max (bbl/min)
9,421.0	12,141.0	76.9	90.4

Bnch/Stg	Start Date	Primary Job Type
	3/29/2017	COMPLETION - ORIGINAL

Comment: # of Clusters = 8, # of Shots = 58

Volume Slurry Total (gal)			
139,003.20			
Treat Pressure Avg (psi)	Treat Pressure Max (psi)	Slurry Rate Avg (bbl/min)	Slurry Rate Max (bbl/min)
9,700.0	12,599.0	47.0	90.5

Bnch/Stg	Start Date	Primary Job Type
	3/29/2017	COMPLETION - ORIGINAL

Comment: # of Clusters = 11, # of Shots = 86

Volume Slurry Total (gal)			
979,540.80			
Treat Pressure Avg (psi)	Treat Pressure Max (psi)	Slurry Rate Avg (bbl/min)	Slurry Rate Max (bbl/min)
8,866.0	10,742.0	69.0	90.0

Bnch/Stg	Start Date	Primary Job Type
	3/29/2017	COMPLETION - ORIGINAL

Comment: # of Clusters = 8, # of Shots = 58

Volume Slurry Total (gal)			
744,420.60			
Treat Pressure Avg (psi)	Treat Pressure Max (psi)	Slurry Rate Avg (bbl/min)	Slurry Rate Max (bbl/min)
7,396.0	9,237.0	84.9	91.5

Bnch/Stg	Start Date	Primary Job Type
	3/29/2017	COMPLETION - ORIGINAL

Comment: # of Clusters = 8, # of Shots = 58

Volume Slurry Total (gal)			
749,061.60			
Treat Pressure Avg (psi)	Treat Pressure Max (psi)	Slurry Rate Avg (bbl/min)	Slurry Rate Max (bbl/min)
7,511.0	8,669.0	89.0	91.7

Bnch/Stg	Start Date	Primary Job Type
	3/30/2017	COMPLETION - ORIGINAL

Comment: # of Clusters = 8, # of Shots = 58

Volume Slurry Total (gal)			
748,893.60			
Treat Pressure Avg (psi)	Treat Pressure Max (psi)	Slurry Rate Avg (bbl/min)	Slurry Rate Max (bbl/min)
7,572.0	10,034.0	88.6	91.6

Bnch/Stg	Start Date	Primary Job Type
	3/30/2017	COMPLETION - ORIGINAL

Comment: # of Clusters = 8, # of Shots = 58

Volume Slurry Total (gal)			
745,164.00			
Treat Pressure Avg (psi)	Treat Pressure Max (psi)	Slurry Rate Avg (bbl/min)	Slurry Rate Max (bbl/min)
7,607.0	9,476.0	88.1	90.4

Bnch/Stg	Start Date	Primary Job Type
	3/30/2017	COMPLETION - ORIGINAL

Comment: # of Clusters = 8, # of Shots = 58

Volume Slurry Total (gal)			
731,077.20			
Treat Pressure Avg (psi)	Treat Pressure Max (psi)	Slurry Rate Avg (bbl/min)	Slurry Rate Max (bbl/min)
7,662.0	9,514.0	88.9	90.8

Report Printed: 12/11/2017

Frac Wellbore Schematic Report

noble energy

Well Name: MND-6F-HS

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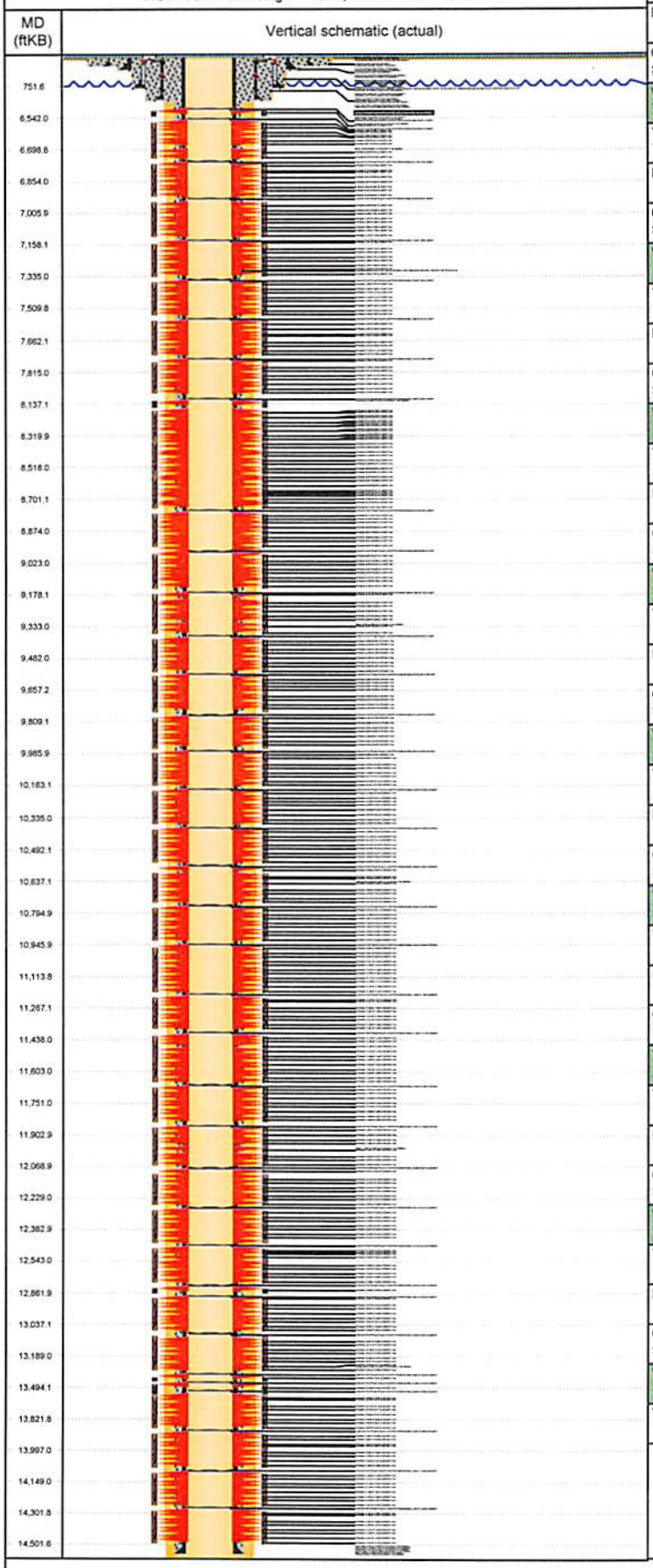


Stimulation Intervals

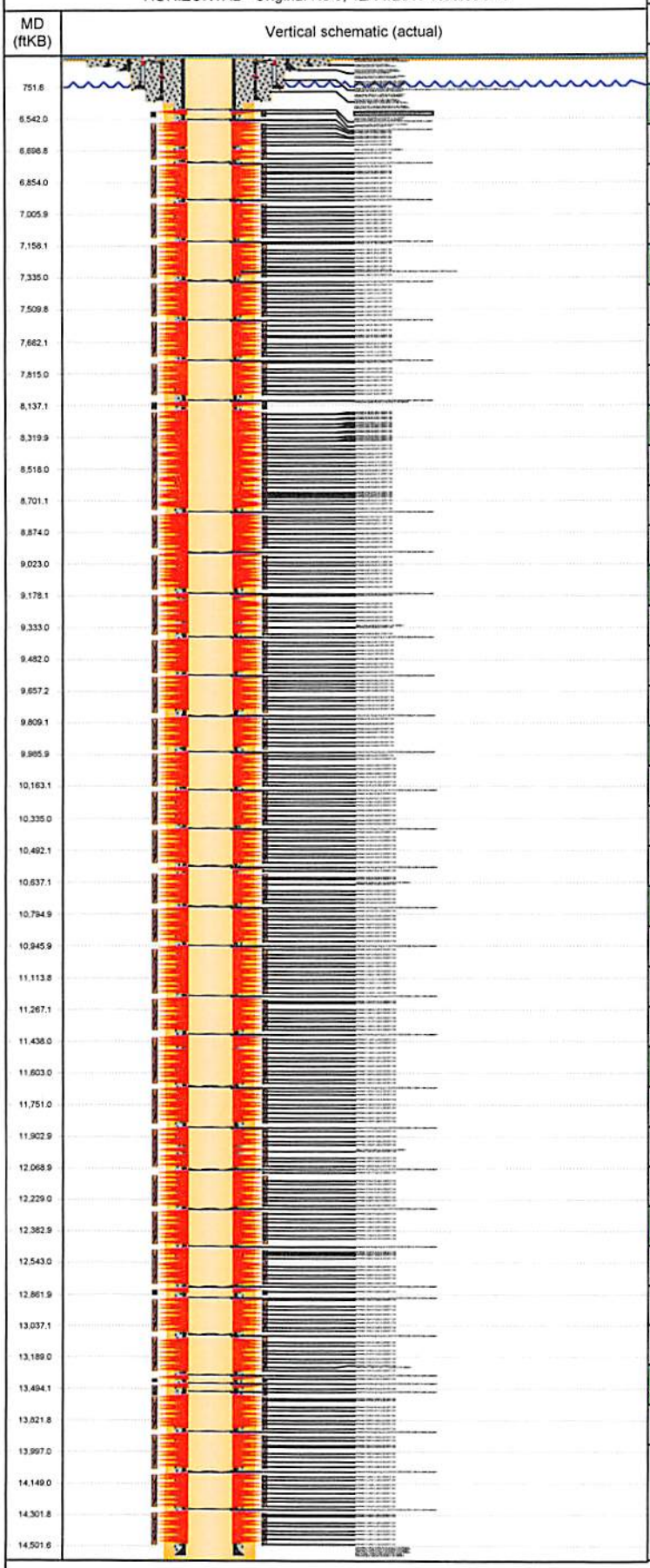
Bnch/Stg	Start Date	Primary Job Type		
	3/31/2017	COMPLETION - ORIGINAL		
Comment	# of Clusters = 8, # of Shots = 58			
Volume Slurry Total (gal)	740,090.40			
Treat Pressure Avg (psi)	Treat Pressure Max (psi)	Slurry Rate Avg (bbl/min)	Slurry Rate Max (bbl/min)	
7,407.0	9,118.0	88.7	91.4	
Bnch/Stg	Start Date	Primary Job Type		
	3/31/2017	COMPLETION - ORIGINAL		
Comment	# of Clusters = 8, # of Shots = 58			
Volume Slurry Total (gal)	693,949.20			
Treat Pressure Avg (psi)	Treat Pressure Max (psi)	Slurry Rate Avg (bbl/min)	Slurry Rate Max (bbl/min)	
7,621.0	8,554.0	88.4	91.1	
Bnch/Stg	Start Date	Primary Job Type		
	4/1/2017	COMPLETION - ORIGINAL		
Comment	# of Clusters = 8, # of Shots = 58			
Volume Slurry Total (gal)	709,014.60			
Treat Pressure Avg (psi)	Treat Pressure Max (psi)	Slurry Rate Avg (bbl/min)	Slurry Rate Max (bbl/min)	
7,683.0	9,217.0	88.1	90.4	
Bnch/Stg	Start Date	Primary Job Type		
	4/1/2017	COMPLETION - ORIGINAL		
Comment	# of Clusters = 8, # of Shots = 58			
Volume Slurry Total (gal)	735,840.00			
Treat Pressure Avg (psi)	Treat Pressure Max (psi)	Slurry Rate Avg (bbl/min)	Slurry Rate Max (bbl/min)	
7,987.0	9,159.0	89.9	90.9	
Bnch/Stg	Start Date	Primary Job Type		
	4/1/2017	COMPLETION - ORIGINAL		
Comment	# of Clusters = 8, # of Shots = 58			
Volume Slurry Total (gal)	730,871.40			
Treat Pressure Avg (psi)	Treat Pressure Max (psi)	Slurry Rate Avg (bbl/min)	Slurry Rate Max (bbl/min)	
7,912.0	8,854.0	87.8	93.3	
Bnch/Stg	Start Date	Primary Job Type		
	4/1/2017	COMPLETION - ORIGINAL		
Comment	# of Clusters = 8, # of Shots = 58			
Volume Slurry Total (gal)	738,910.20			
Treat Pressure Avg (psi)	Treat Pressure Max (psi)	Slurry Rate Avg (bbl/min)	Slurry Rate Max (bbl/min)	
7,864.0	9,224.0	89.0	90.8	
Bnch/Stg	Start Date	Primary Job Type		
	4/2/2017	COMPLETION - ORIGINAL		
Comment	# of Clusters = 8, # of Shots = 58			
Volume Slurry Total (gal)	740,094.60			
Treat Pressure Avg (psi)	Treat Pressure Max (psi)	Slurry Rate Avg (bbl/min)	Slurry Rate Max (bbl/min)	
7,696.0	8,880.0	89.1	90.9	
Bnch/Stg	Start Date	Primary Job Type		
	4/2/2017	COMPLETION - ORIGINAL		
Comment	# of Clusters = 8, # of Shots = 58			
Volume Slurry Total (gal)	729,153.60			
Treat Pressure Avg (psi)	Treat Pressure Max (psi)	Slurry Rate Avg (bbl/min)	Slurry Rate Max (bbl/min)	
7,544.0	8,375.0	89.3	91.3	
Bnch/Stg	Start Date	Primary Job Type		
	4/2/2017	COMPLETION - ORIGINAL		
Comment	# of Clusters = 8, # of Shots = 58			
Volume Slurry Total (gal)	709,254.00			
Treat Pressure Avg (psi)	Treat Pressure Max (psi)	Slurry Rate Avg (bbl/min)	Slurry Rate Max (bbl/min)	
7,320.0	8,450.0	88.6	90.4	

Frac Wellbore Schematic Report

noble energy

Well Name: MND-6F-HS

HORIZONTAL - Original Hole, 12/11/2017 3:05:58 PM



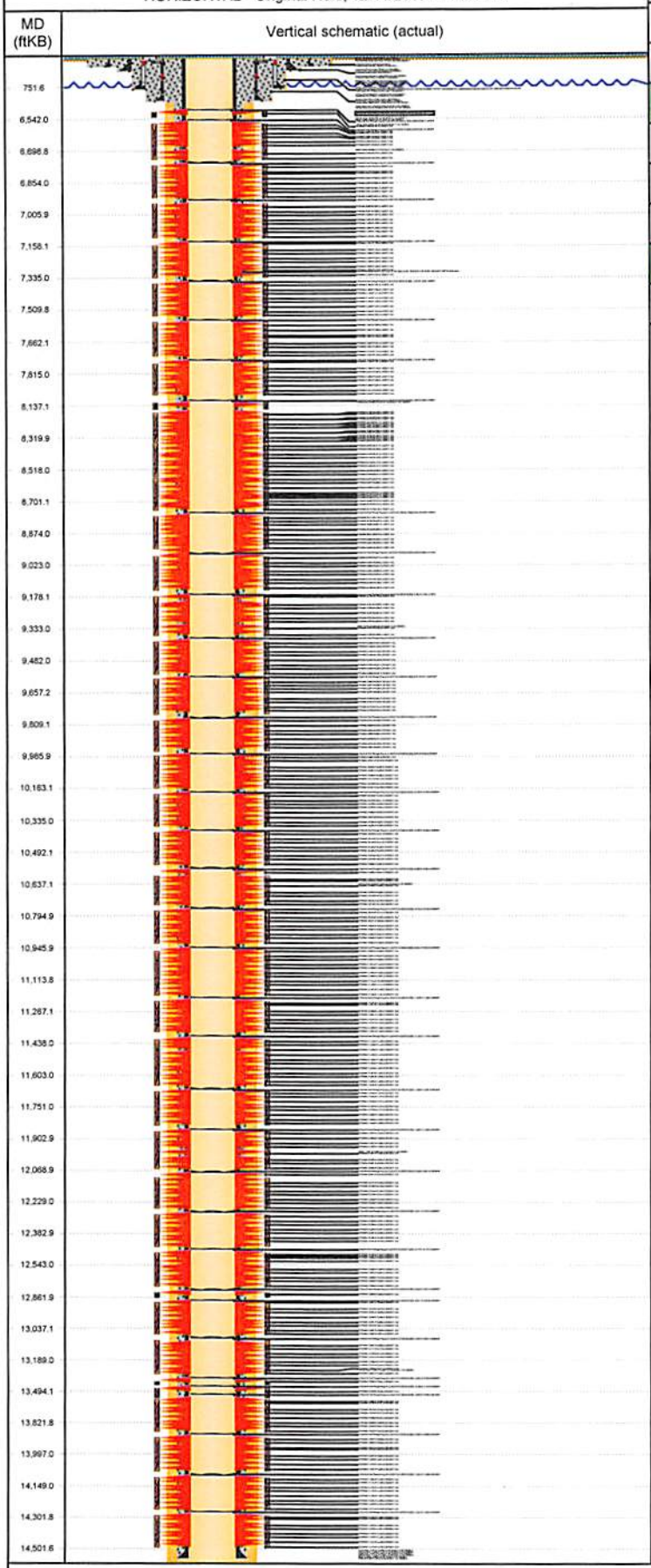
Stimulation Intervals

Bnch/Stg	Start Date	Primary Job Type		
	4/3/2017	COMPLETION - ORIGINAL		
Comment: # of Clusters = 8, # of Shots = 58				
Volume Slurry Total (gal): 714,445.20				
Treat Pressure Avg (psi): 7,331.0	Treat Pressure Max (psi): 13,908.0	Slurry Rate Avg (bbl/min): 88.6	Slurry Rate Max (bbl/min): 91.0	
Bnch/Stg	Start Date	Primary Job Type		
	4/3/2017	COMPLETION - ORIGINAL		
Comment: # of Clusters = 8, # of Shots = 58				
Volume Slurry Total (gal): 2,809.80				
Treat Pressure Avg (psi): 6,172.0	Treat Pressure Max (psi): 10,265.0	Slurry Rate Avg (bbl/min): 2.1	Slurry Rate Max (bbl/min): 2.9	
Bnch/Stg	Start Date	Primary Job Type		
	4/6/2017	COMPLETION - ORIGINAL		
Comment: # of Clusters = 8, # of Shots = 58				
Volume Slurry Total (gal): 13,020.00				
Treat Pressure Avg (psi): 3,401.0	Treat Pressure Max (psi): 4,686.0	Slurry Rate Avg (bbl/min): 12.2	Slurry Rate Max (bbl/min): 25.8	
Bnch/Stg	Start Date	Primary Job Type		
	4/6/2017	COMPLETION - ORIGINAL		
Comment: # of Clusters = 8, # of Shots = 58				
Volume Slurry Total (gal): 717,402.00				
Treat Pressure Avg (psi): 6,659.0	Treat Pressure Max (psi): 7,807.0	Slurry Rate Avg (bbl/min): 84.6	Slurry Rate Max (bbl/min): 91.1	
Bnch/Stg	Start Date	Primary Job Type		
	4/7/2017	COMPLETION - ORIGINAL		
Comment: # of Clusters = 8, # of Shots = 58				
Volume Slurry Total (gal): 749,057.40				
Treat Pressure Avg (psi): 6,991.0	Treat Pressure Max (psi): 8,183.0	Slurry Rate Avg (bbl/min): 92.1	Slurry Rate Max (bbl/min): 98.3	
Bnch/Stg	Start Date	Primary Job Type		
	4/7/2017	COMPLETION - ORIGINAL		
Comment: # of Clusters = 8, # of Shots = 58				
Volume Slurry Total (gal): 728,666.40				
Treat Pressure Avg (psi): 7,198.0	Treat Pressure Max (psi): 8,225.0	Slurry Rate Avg (bbl/min): 89.4	Slurry Rate Max (bbl/min): 90.9	
Bnch/Stg	Start Date	Primary Job Type		
	4/8/2017	COMPLETION - ORIGINAL		
Comment: # of Clusters = 8, # of Shots = 58				
Volume Slurry Total (gal): 743,320.20				
Treat Pressure Avg (psi): 7,109.0	Treat Pressure Max (psi): 8,307.0	Slurry Rate Avg (bbl/min): 95.9	Slurry Rate Max (bbl/min): 96.9	
Bnch/Stg	Start Date	Primary Job Type		
	4/8/2017	COMPLETION - ORIGINAL		
Comment: # of Clusters = 8, # of Shots = 58				
Volume Slurry Total (gal): 676,825.80				
Treat Pressure Avg (psi): 7,098.0	Treat Pressure Max (psi): 8,065.0	Slurry Rate Avg (bbl/min): 97.6	Slurry Rate Max (bbl/min): 100.2	
Bnch/Stg	Start Date	Primary Job Type		
	4/8/2017	COMPLETION - ORIGINAL		
Comment: # of Clusters = 8, # of Shots = 58				
Volume Slurry Total (gal): 687,829.80				
Treat Pressure Avg (psi): 7,352.0	Treat Pressure Max (psi): 8,665.0	Slurry Rate Avg (bbl/min): 100.1	Slurry Rate Max (bbl/min): 101.8	

Frac Wellbore Schematic Report

Well Name: MND-6F-HS

HORIZONTAL - Original Hole, 12/11/2017 3:06:00 PM



Stimulation Intervals

Bnch/Stg	Start Date	Primary Job Type
	4/9/2017	COMPLETION - ORIGINAL

Comment
# of Clusters = 8, # of Shots = 58

Volume Slurry Total (gal)			
655,632.60			
Treat Pressure Avg (psi)	Treat Pressure Max (psi)	Slurry Rate Avg (bbl/min)	Slurry Rate Max (bbl/min)
7,060.0	8,458.0	100.2	101.6

Bnch/Stg	Start Date	Primary Job Type
	4/9/2017	COMPLETION - ORIGINAL

Comment
# of Clusters = 8, # of Shots = 58

Volume Slurry Total (gal)			
656,838.00			
Treat Pressure Avg (psi)	Treat Pressure Max (psi)	Slurry Rate Avg (bbl/min)	Slurry Rate Max (bbl/min)
7,168.0	8,895.0	99.1	103.4

WR-35
Rev. 8/23/13

API 47- 051 - 01762 Farm name Consolidated Coal Company Well number MND 06 FHS

PRODUCING FORMATION(S)	DEPTHS			
Marcellus	5940	TVD	14,650	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
	5058 mcfpd	168.90 bpd	316.14 bpd	335 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		
					See attached

Please insert additional pages as applicable.

Drilling Contractor Nomac 79 Drilling
Address 171 Locust Ave. Ext. City Mt. Morris State PA Zip 15349

Logging Company Baker Hughes
Address 400 Technology Drive City Canonsburg State PA Zip 15317

Cementing Company Schlumberger
Address 4600 J. Barry Ct., Suite 200 City Canonsburg State PA Zip 15317

Stimulating Company Schlumberger
Address 4600 J. Barry Ct., Ste 200 City Canonsburg State PA Zip 15317

Please insert additional pages as applicable.

Completed by Logan Boughal Telephone 832-639-7447
Signature _____ Title Regulatory Analyst II Date 12/11/2017

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

MND 6

Formations	Top TVD	Base TVD	Top MD	Base MD	Fluid
Shale and Sandstone	0	284	0	284	
Pittsburgh Coal	284	294	284	294	
Shale and Sandstone	294	706	294	706	
Dunkard Sand	706	727	706	727	
Shale	727	876	727	876	
Gas Sand	876	947	876	5972	
Shale	947	1016	947	6191	
1st Salt Sand	1016	1032	1016	6313	
Shale	1032	1139	1032	6719	
2nd Salt Sand	1139	1168	1139	7118	
Shale and Sandstone	1168	1298	1168	7333	
Maxton Sand	1298	1345	1298	8194	
Shale	1345	1363	1345	8194	
Big Lime	1363	1435	1363	8541	
Big Injun	1435	1705	1435	8869	
Price	1705	1803	1705	8890	
Murrysville	1803	1910	1803	8983	
Shale and Sandstone	1910	2448	1910	8998	
Gordon	2448	2478	2448	9073	
Shale and Sandstone	2478	2999	2478	9179	
Fifth Sand	2999	3052	2999	9995	
Shale and Sandstone	3052	3854	3052	9179	
Warren Sand	3854	3863	3860	9995	
Shale	3863	4580	3869	10660	
Java Shale	4580	4664	4593	not encountered	
Pipe Creek Shale	4664	4739	4678	not encountered	
Angola Shale	4739	5323	4754	not encountered	
Rhinestreet	5323	5642	5344	not encountered	
Cashaqua	5642	5714	5666	not encountered	
Middlesex	5714	5737	5739	not encountered	
West River	5737	5798	5762	not encountered	
Burkett	5798	5822	5824	not encountered	
Tully Limestone	5822	5848	5848	not encountered	
Hamilton	5848	5883	5875	not encountered	
Marcellus	5883	5936	5910	not encountered	
Onondaga	5936	5944	5964	not encountered	
Huntersville	5944	6158	5972	6191	
Oriskany	6158	6270	6191	6313	
Helderburg	6270	6530	6313	6719	
Bass Island Dolomite	6530	6609	6719	7118	
Salina G Big Lime	6609	6809	7118	7333	
Salina F	6809	7608	7333	8194	
Lockport Dolomite	7608	7930	8194	8541	
Rochester Shale	7930	8235	8541	8869	
Dayton Fm/Packer Shell	8235	8254	8869	8890	

Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date:	4/9/2017
Job End Date:	4/10/2017
State:	West Virginia
County:	Marshall
API Number:	47-051-01762-00-00
Operator Name:	Noble Energy, Inc.
Well Name and Number:	MND 6 F
Latitude:	39.81760000
Longitude:	-80.79191389
Datum:	NAD27
Federal Well:	NO
Indian Well:	NO
True Vertical Depth:	14,501
Total Base Water Volume (gal):	27,970,798
Total Base Non Water Volume:	0

Hydraulic Fracturing Fluid Composition:

Trade Name	Supplier	Purpose	Ingredients	Chemical Abstract Service Number (CAS #)	Maximum Ingredient Concentration in Additive (% by mass)**	Maximum Ingredient Concentration in HF Fluid (% by mass)**	Comments
Fresh Water	Operator	Base Fluid					
			Water	7732-18-5	100.00000	87.29715	Density = 8.340
Ingredients	Listed Above	Listed Above					
			Water	7732-18-5	100.00000	0.13573	

HYDROCHLORIC ACID	Halliburton	Solvent					
				Listed Below			
FE-1A ACIDIZING COMPOSITION	Halliburton	Additive					
				Listed Below			
SAND-PREMIUM WHITE-40/70, BULK	Halliburton	Proppant					
				Listed Below			
WG-36 GELLING AGENT	Halliburton	Gelling Agent					
				Listed Below			
FR-76	Halliburton	Friction Reducer					
				Listed Below			
SAND-COMMON WHITE-100 MESH, SSA-2, BULK (100003676)	Halliburton	Proppant					
				Listed Below			
HAI-OS ACID INHIBITOR	Halliburton	Corrosion Inhibitor					
				Listed Below			
SP BREAKER	Halliburton	Breaker					

				Listed Below			
OILPERM A	Halliburton	Non-ionic Surfactant					
				Listed Below			
B-84	X-Chem	Biocide					
				Listed Below			
SC-30	X-Chem	Scale Inhibitor					
				Listed Below			
Items above are Trade Names with the exception of Base Water . Items below are the individual ingredients.							
			Crystalline silica, quartz	14808-60-7	100.00000	12.53921	
			Hydrotreated light petroleum distillate	64742-47-8	30.00000	0.01542	
			Acrylamide acrylate copolymer	Proprietary	30.00000	0.01542	Denise Tuck, Halliburton, 3000 N. Sam Houston Pkwy E., Houston, TX 77032, 281-871-6226
			Inorganic salt	Proprietary	30.00000	0.01542	
			Water	7732-18-5	100.00000	0.01026	
			Glutaraldehyde	111-30-8	30.00000	0.00916	
			Hydrochloric acid	7647-01-0	7.50000	0.00787	
			Guar gum	9000-30-0	100.00000	0.00370	
			n-Alkyl dimethyl benzyl ammonium chloride	68424-85-1	10.00000	0.00305	
			Didecyl dimethyl ammonium chloride	7173-51-5	10.00000	0.00305	
			Acetic anhydride	108-24-7	100.00000	0.00230	
			Ethanol	64-17-5	5.00000	0.00153	
			Acetic acid	64-19-7	60.00000	0.00138	
			Ethanol	64-17-5	60.00000	0.00046	

			Oxyalkylated phenolic resin	Proprietary	30.00000	0.00031	
			Heavy aromatic petroleum naphtha	64742-94-5	30.00000	0.00023	
			Methanol	67-56-1	60.00000	0.00023	
			Sodium persulfate	7775-27-1	100.00000	0.00019	
			Sodium Hydroxide	1310-73-2	1.50000	0.00015	
			Reaction product of acetophenone, formaldehyde, thiourea and oleic acid in dimethyl formamide	68527-49-1	30.00000	0.00011	
			Fatty acids, tall oil	Proprietary	30.00000	0.00011	
			Ethoxylated alcohols	Proprietary	30.00000	0.00011	
			Olefins	Proprietary	5.00000	0.00005	
			Naphthalene	91-20-3	5.00000	0.00004	
			Poly(oxy-1,2-ethanediyl), alpha-(4-nonylphenyl)-omega-hydroxy-, branched	127087-87-0	5.00000	0.00004	
			Propargyl alcohol	107-19-7	10.00000	0.00004	
			1,2,4 Trimethylbenzene	95-63-6	1.00000	0.00001	
			Sodium sulfate	7757-82-6	0.10000	0.00000	

* Total Water Volume sources may include various types of water including fresh water, produced water, and recycled water
** Information is based on the maximum potential for concentration and thus the total may be over 100%
*** If you are calculating a percentage of total ingredients do not add the water volume below the green line to the water volume above the green line

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)