WR-35
Rev. 8/23/13

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

API 47- 051 - 01744 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 BHS
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	39.817722	Easting	80.791573
Landing Point of Curve	Northing	39.820199	Easting	80.790978
Bottom Hole	Northing	39.846889	Easting	80.815953

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 □ 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 05/21/2014 Date drilling commenced 09/11/2014 Date drilling ceased 10/19/2014
Date completion activities began 05/14/2017 Date completion activities ceased 06/03/2017
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' & 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) N

Reviewed 2/7/18

Reviewed by:

WR-35
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API 47- 051 - 01744 Farm name Consolidated Coal Company Well number MND 06 BHS

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"	110'	New	H-40		Y
Coal	17.5"	13 3/8"	711'	New	J-55		Y
Intermediate 1	12.38"	9 5/8"	2034'	New	HCK-55		Y
Intermediate 2							
Intermediate 3							
Production	8-3/4" & 8-1/2"	5 1/2"	18,368'	New	P-110		Y
Tubing							
Packer type and depth set							

Comment Details

CEMENT DATA	Class/Type of Cement	Number of Sacks	Slurry wt (ppg)	Yield (ft^3/sks)	Volume (ft^3)	Cement Top (MD)	WOC (hrs)
Conductor	CaCl 1.15					0	8
Surface	CaCl 1.15					0	8
Coal	Type 1/ Class A	482	15.6	1.39	669.98	0	8
Intermediate 1	Type 1 / Class A	684	15.6	1.19	819.96	0	8
Intermediate 2							
Intermediate 3							
Production	Type 1 / Class A	Lead 627 Tail 2536	14.8	Lead 1.54 Tail 1.37	total 4,439.9	2465.0	8
Tubing							

Drillers TD (ft) 18,369' Loggers TD (ft) 18,343'

Deepest formation penetrated Marcellus Plug back to (ft)

Plug back procedure

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Kick off depth (ft) 4,955'

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.
17 Centralizers on Intermediate String (Bow string centralizers on first two joints then every third joint to 100' from surface).
332 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

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PERFORATION RECORD

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

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Please insert additional pages as applicable.

STIMULATION INFORMATION PER STAGE

Complete a separate record for each stimulation stage.

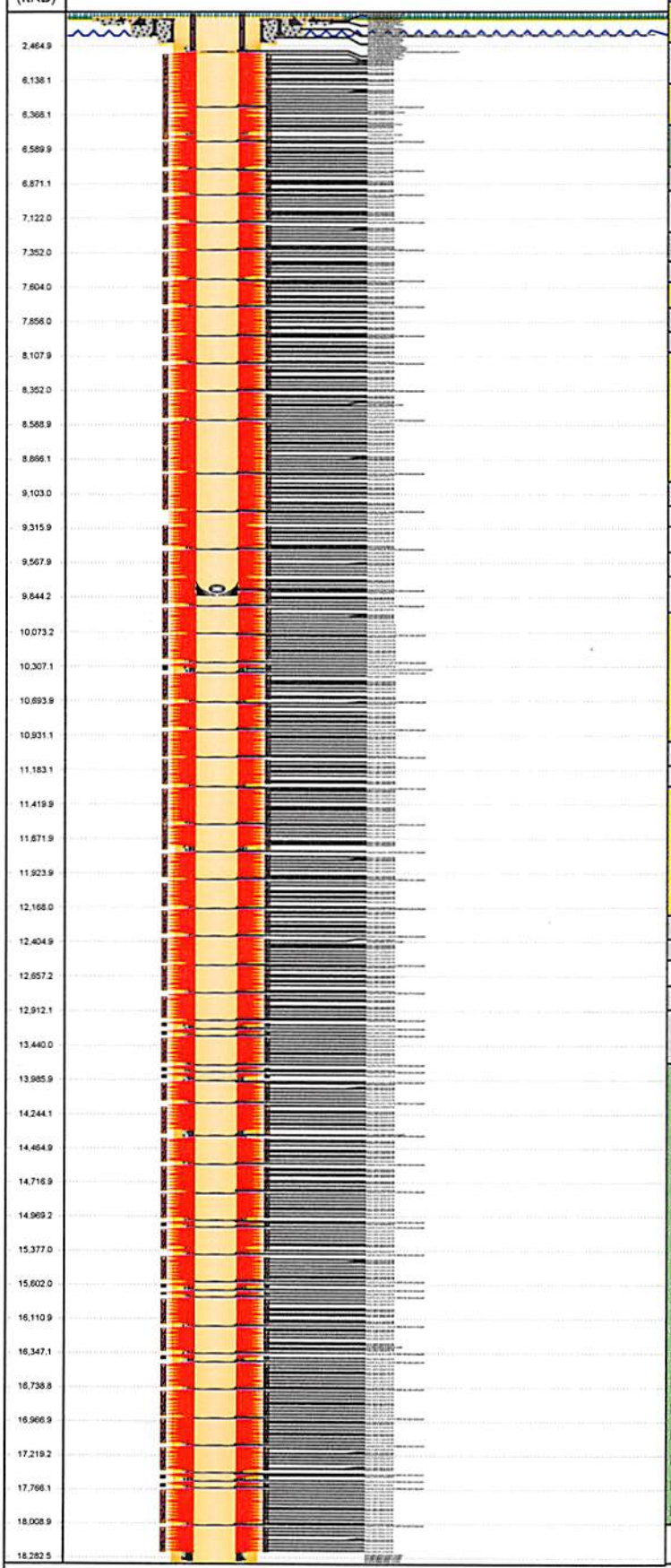
Stage No.	Stimulations Date	Ave Pump Rate (BPM)	Ave Treatment Pressure (PSI)	Max Breakdown Pressure (PSI)	ISIP (PSI)	Amount of Proppant (lbs)	Amount of Water (bbls)	Amount of Nitrogen/other (units)
								See Attached

Please insert additional pages as applicable.

Frac Wellbore Schematic Report

Well Name: MND-6B-HS

HORIZONTAL - Original Hole, 12/11/2017 3:05:15 PM



Well Header

API	Business Unit	District	Well Config
47-051-01744	MARCELLUS	30	HORIZONTAL
Original KB Elevation (ft)	**KB - GL / MSL (ftKB)**	**Spud Date**	**P & A Date**
748	25.90	9/11/2014	

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	26	0	40
CONDUCTOR 1	18	40	110
SURFACE	17 1/2	110	758
INTERMEDIATE	12 1/4	758	2,075
PRODUCTION	8 3/4	2075	18,369

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	8/10/2014	20	307.00	DH-36	25.9	40.0
Conductor	8/24/2014	16	97.00	HCQ-125	25.9	110.0
Surface	9/14/2014	13 3/8	54.50	J-55	25.9	738.0
Intermediate 1	10/5/2014	9 5/8	36.00	HCK-55	25.9	2,061.4
Production	10/16/2014	5 1/2	23.00	P-110	-6.9	18,368.0

Cement

Des	Top (ftKB)	Btm (ftKB)
Conductor Cement	25.9	110.0
Conductor Cement	25.9	40.0
Surface Casing Cement	25.9	738.0
Intermediate 1 Casing Cement	25.9	2,061.4
Production Casing Cement	2,465.0	18,368.0

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	60	60	5,938.00	6,113.00	6/2/2017
MARCELLUS, Original Hole	59	59	6,138.00	6,311.00	6/1/2017
MARCELLUS, Original Hole	58	58	6,342.00	6,519.00	6/1/2017
MARCELLUS, Original Hole	57	58	6,544.00	6,718.00	6/1/2017
MARCELLUS, Original Hole	56	58	6,746.00	6,920.00	6/1/2017
MARCELLUS, Original Hole	55	58	6,948.00	7,124.00	5/31/2017
MARCELLUS, Original Hole	54	58	7,149.00	7,323.00	5/31/2017
MARCELLUS, Original Hole	53	58	7,352.00	7,529.00	5/31/2017
MARCELLUS, Original Hole	52	58	7,558.00	7,729.00	5/31/2017
MARCELLUS, Original Hole	51	58	7,754.00	7,927.00	5/31/2017
MARCELLUS, Original Hole	50	58	7,958.00	8,135.00	5/30/2017
MARCELLUS, Original Hole	49	58	8,160.00	8,337.00	5/30/2017
MARCELLUS, Original Hole	48	58	8,362.00	8,539.00	5/30/2017
MARCELLUS, Original Hole	47	58	8,564.00	8,741.00	5/29/2017
MARCELLUS, Original Hole	46	58	8,766.00	8,940.00	5/29/2017
MARCELLUS, Original Hole	45B	28	8,968.00	9,010.00	5/28/2017
MARCELLUS, Original Hole	45A	58	9,028.00	9,205.00	5/28/2017
MARCELLUS, Original Hole	44B	28	9,230.00	9,272.00	5/28/2017

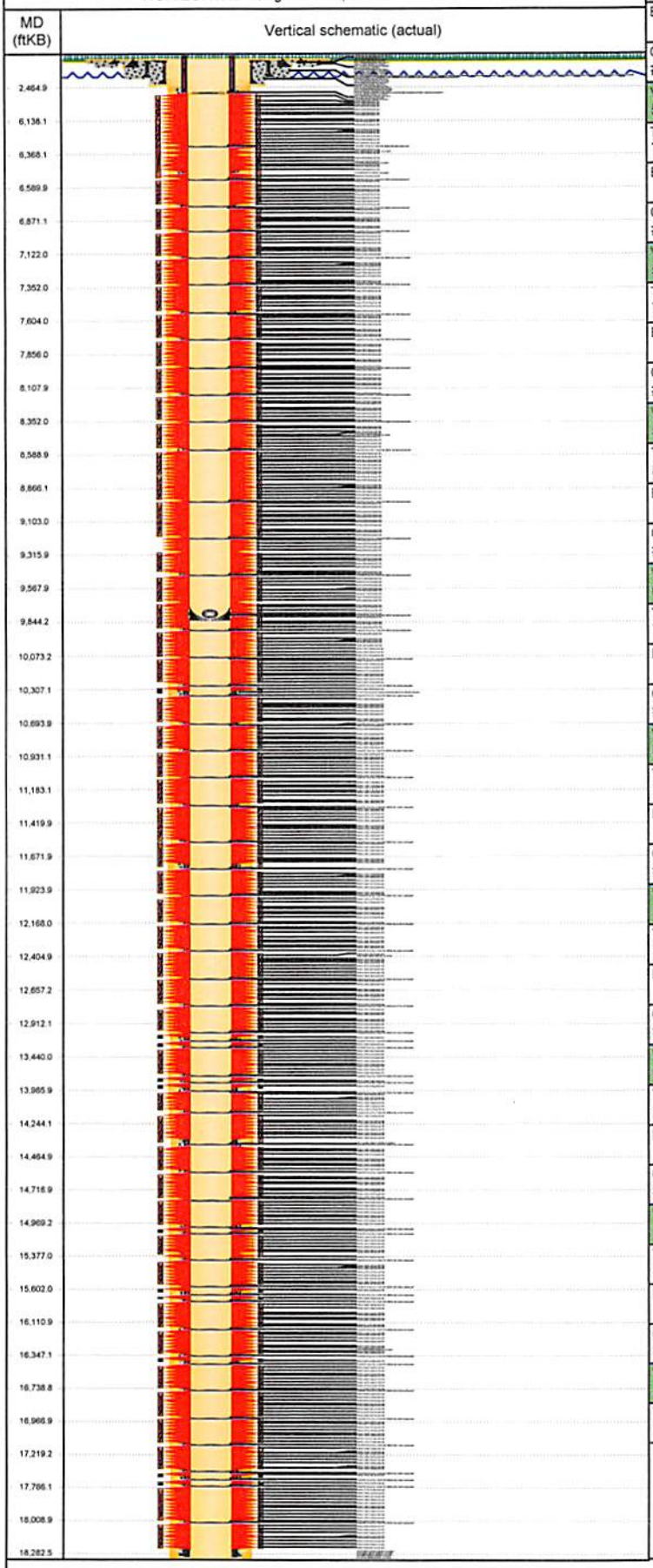
Report Printed: 12/11/2017

Frac Wellbore Schematic Report

noble energy

Well Name: MND-6B-HS

HORIZONTAL - Original Hole, 12/11/2017 3:40:31 PM



Stimulation Intervals

Bnch/Stg	Start Date	Primary Job Type
	5/18/2017	

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

Volume Slurry Total (gal)	Treat Pressure Avg (psi)	Treat Pressure Max (psi)	Slurry Rate Avg (bbl/min)	Slurry Rate Max (bbl/min)
537,616.80	7,982.0	8,677.0	81.9	86.7

Bnch/Stg	Start Date	Primary Job Type
	5/18/2017	

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

Volume Slurry Total (gal)	Treat Pressure Avg (psi)	Treat Pressure Max (psi)	Slurry Rate Avg (bbl/min)	Slurry Rate Max (bbl/min)
556,256.40	7,770.0	10,667.0	82.2	85.1

Bnch/Stg	Start Date	Primary Job Type
	5/18/2017	

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

Volume Slurry Total (gal)	Treat Pressure Avg (psi)	Treat Pressure Max (psi)	Slurry Rate Avg (bbl/min)	Slurry Rate Max (bbl/min)
562,514.40	8,041.0	10,739.0	88.8	90.5

Bnch/Stg	Start Date	Primary Job Type
	5/18/2017	

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

Volume Slurry Total (gal)	Treat Pressure Avg (psi)	Treat Pressure Max (psi)	Slurry Rate Avg (bbl/min)	Slurry Rate Max (bbl/min)
603,283.80	7,834.0	8,678.0	84.7	88.5

Bnch/Stg	Start Date	Primary Job Type
	5/19/2017	

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

Volume Slurry Total (gal)	Treat Pressure Avg (psi)	Treat Pressure Max (psi)	Slurry Rate Avg (bbl/min)	Slurry Rate Max (bbl/min)
618,655.80	7,942.0	8,852.0	84.9	87.2

Bnch/Stg	Start Date	Primary Job Type
	5/19/2017	

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

Volume Slurry Total (gal)	Treat Pressure Avg (psi)	Treat Pressure Max (psi)	Slurry Rate Avg (bbl/min)	Slurry Rate Max (bbl/min)
552,489.00	7,515.0	10,581.0	77.6	80.4

Bnch/Stg	Start Date	Primary Job Type
	5/19/2017	

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

Volume Slurry Total (gal)	Treat Pressure Avg (psi)	Treat Pressure Max (psi)	Slurry Rate Avg (bbl/min)	Slurry Rate Max (bbl/min)
631,163.40	8,176.0	8,937.0	86.3	89.2

Bnch/Stg	Start Date	Primary Job Type
	5/20/2017	

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

Volume Slurry Total (gal)	Treat Pressure Avg (psi)	Treat Pressure Max (psi)	Slurry Rate Avg (bbl/min)	Slurry Rate Max (bbl/min)
539,989.80	7,917.0	8,769.0	84.8	86.2

Bnch/Stg	Start Date	Primary Job Type
	5/20/2017	

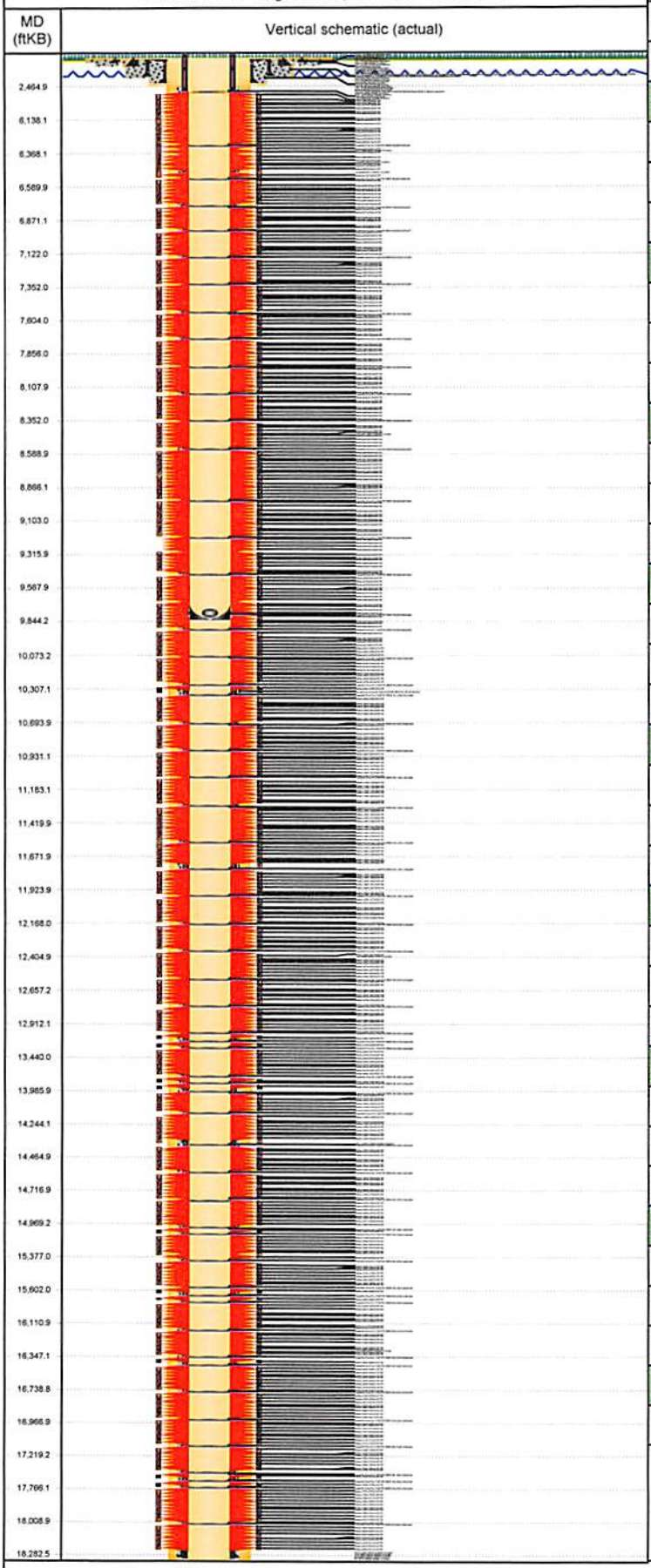
Comment: # of Clusters = 8, # of Shots = 58

Volume Slurry Total (gal)	Treat Pressure Avg (psi)	Treat Pressure Max (psi)	Slurry Rate Avg (bbl/min)	Slurry Rate Max (bbl/min)
512,391.60	7,500.0	10,131.0	82.9	85.4

Frac Wellbore Schematic Report

Well Name: MND-6B-HS

HORIZONTAL - Original Hole, 12/11/2017 3:40:32 PM



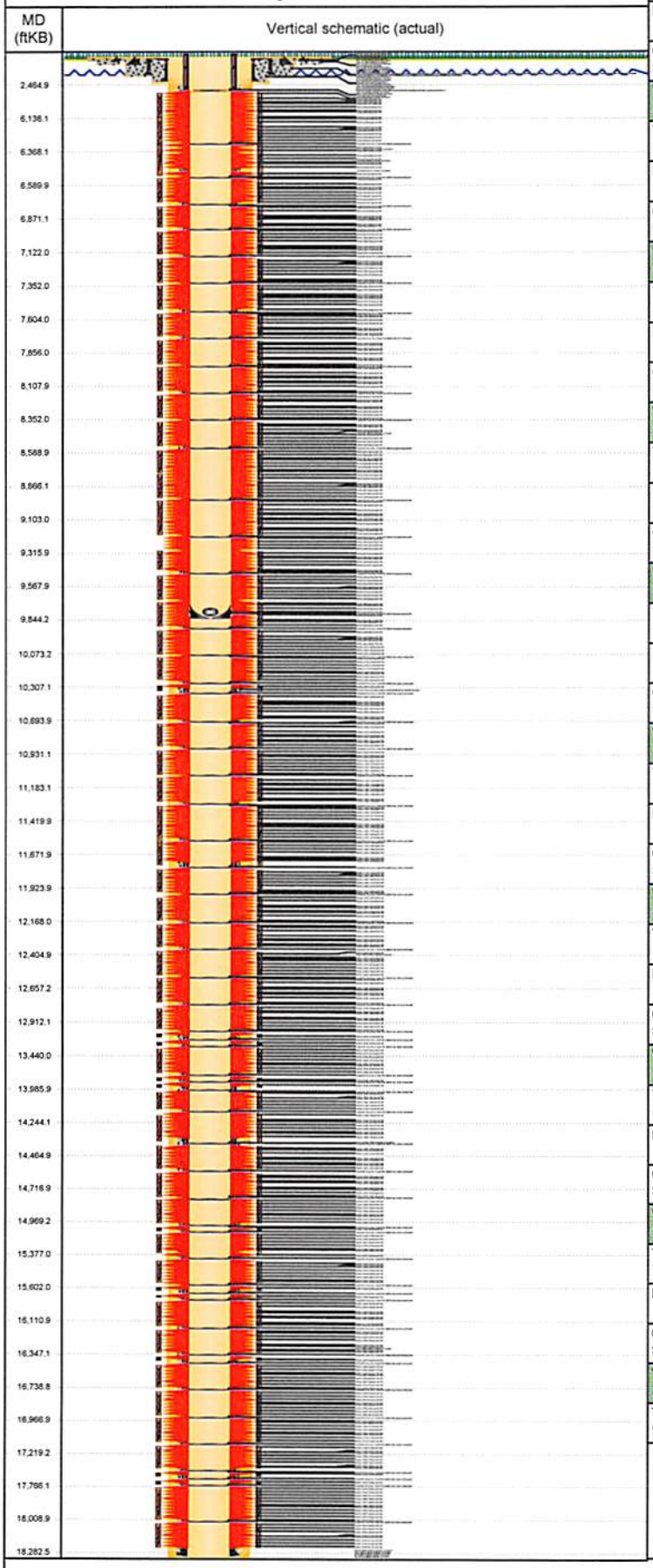
Stimulation Intervals

Bnch/Stg	Start Date	Primary Job Type		
	5/20/2017			
Comment	# of Clusters = 8, # of Shots = 58			
Volume Slurry Total (gal)	716,692.20			
Treat Pressure Avg (psi)	Treat Pressure Max (psi)	Slurry Rate Avg (bbl/min)	Slurry Rate Max (bbl/min)	
8,492.0	11,941.0	83.8	85.4	
Bnch/Stg	Start Date	Primary Job Type		
	5/21/2017			
Comment	# of Clusters = 8, # of Shots = 58			
Volume Slurry Total (gal)	683,004.00			
Treat Pressure Avg (psi)	Treat Pressure Max (psi)	Slurry Rate Avg (bbl/min)	Slurry Rate Max (bbl/min)	
8,096.0	9,274.0	69.7	91.9	
Bnch/Stg	Start Date	Primary Job Type		
	5/21/2017			
Comment	# of Clusters = 8, # of Shots = 58			
Volume Slurry Total (gal)	536,221.14			
Treat Pressure Avg (psi)	Treat Pressure Max (psi)	Slurry Rate Avg (bbl/min)	Slurry Rate Max (bbl/min)	
8,015.0	10,980.0	76.1	87.2	
Bnch/Stg	Start Date	Primary Job Type		
	5/21/2017			
Comment	# of Clusters = 6, # of Shots = 43			
Volume Slurry Total (gal)	526,885.80			
Treat Pressure Avg (psi)	Treat Pressure Max (psi)	Slurry Rate Avg (bbl/min)	Slurry Rate Max (bbl/min)	
8,628.0	11,465.0	81.5	86.6	
Bnch/Stg	Start Date	Primary Job Type		
	5/22/2017			
Comment	# of Clusters = 8, # of Shots = 58			
Volume Slurry Total (gal)	413,943.60			
Treat Pressure Avg (psi)	Treat Pressure Max (psi)	Slurry Rate Avg (bbl/min)	Slurry Rate Max (bbl/min)	
8,063.0	11,971.0	84.5	90.5	
Bnch/Stg	Start Date	Primary Job Type		
	5/22/2017			
Comment	# of Clusters = 8, # of Shots = 58			
Volume Slurry Total (gal)	493,000.20			
Treat Pressure Avg (psi)	Treat Pressure Max (psi)	Slurry Rate Avg (bbl/min)	Slurry Rate Max (bbl/min)	
7,736.0	10,031.0	78.8	92.3	
Bnch/Stg	Start Date	Primary Job Type		
	5/22/2017			
Comment	# of Clusters = 8, # of Shots = 58			
Volume Slurry Total (gal)	610,541.40			
Treat Pressure Avg (psi)	Treat Pressure Max (psi)	Slurry Rate Avg (bbl/min)	Slurry Rate Max (bbl/min)	
7,914.0	9,893.0	78.4	81.2	
Bnch/Stg	Start Date	Primary Job Type		
	5/22/2017			
Comment	# of Clusters = 8, # of Shots = 58			
Volume Slurry Total (gal)	445,804.80			
Treat Pressure Avg (psi)	Treat Pressure Max (psi)	Slurry Rate Avg (bbl/min)	Slurry Rate Max (bbl/min)	
8,021.0	9,156.0	87.5	94.0	
Bnch/Stg	Start Date	Primary Job Type		
	5/23/2017			
Comment	# of Clusters = 8, # of Shots = 58			
Volume Slurry Total (gal)	563,824.80			
Treat Pressure Avg (psi)	Treat Pressure Max (psi)	Slurry Rate Avg (bbl/min)	Slurry Rate Max (bbl/min)	
8,727.0	10,356.0	81.8	84.8	

Frac Wellbore Schematic Report

Well Name: MND-6B-HS

HORIZONTAL - Original Hole, 12/11/2017 3:40:33 PM



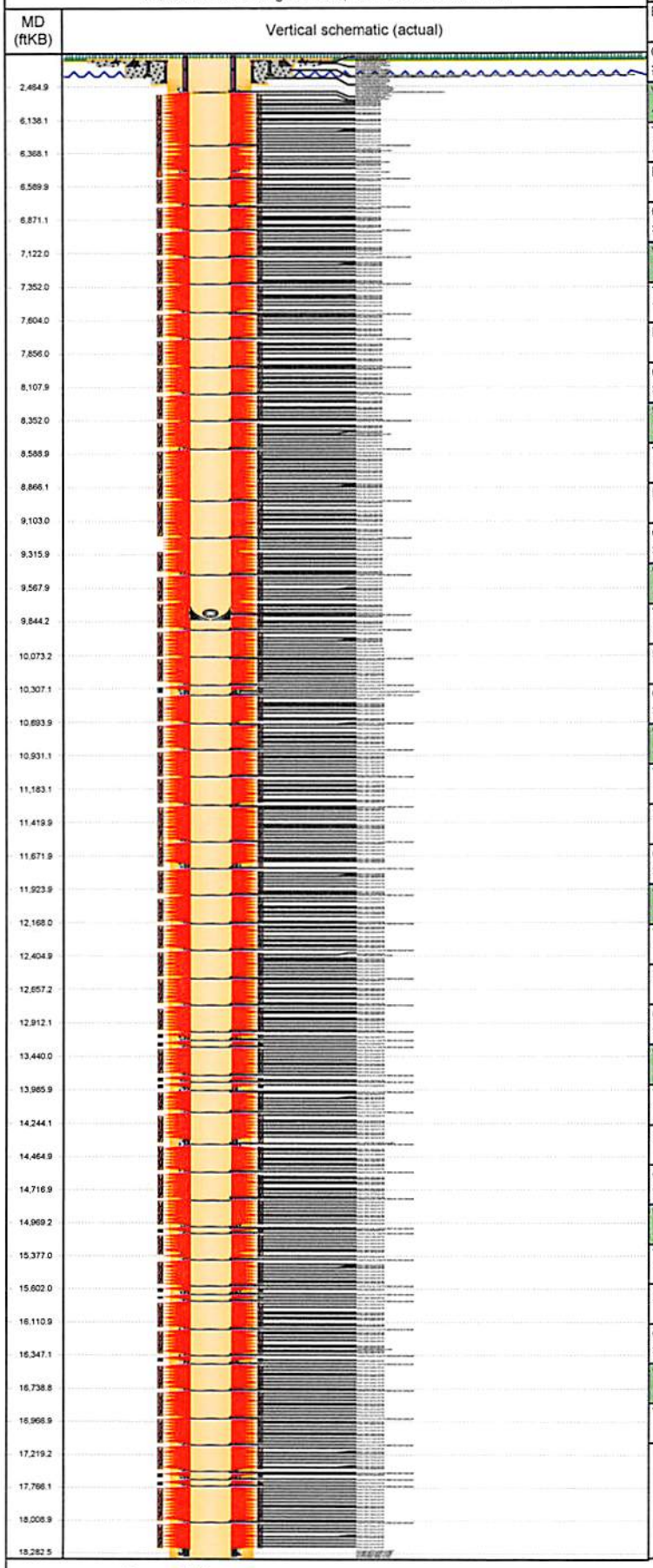
Stimulation Intervals

Bnch/Stg	Start Date	Primary Job Type		
	5/23/2017			
Comment	# of Clusters = 8, # of Shots = 58			
Volume Slurry Total (gal)	551,317.20			
Treat Pressure Avg (psi)	Treat Pressure Max (psi)	Slurry Rate Avg (bbl/min)	Slurry Rate Max (bbl/min)	
8,899.0	10,756.0	82.9	87.0	
Bnch/Stg	Start Date	Primary Job Type		
	5/23/2017			
Comment	# of Clusters = 8, # of Shots = 58			
Volume Slurry Total (gal)	526,323.00			
Treat Pressure Avg (psi)	Treat Pressure Max (psi)	Slurry Rate Avg (bbl/min)	Slurry Rate Max (bbl/min)	
8,121.0	9,299.0	98.2	106.3	
Bnch/Stg	Start Date	Primary Job Type		
	5/23/2017			
Comment	# of Clusters = 8, # of Shots = 58			
Volume Slurry Total (gal)	523,420.80			
Treat Pressure Avg (psi)	Treat Pressure Max (psi)	Slurry Rate Avg (bbl/min)	Slurry Rate Max (bbl/min)	
8,008.0	9,390.0	97.9	99.0	
Bnch/Stg	Start Date	Primary Job Type		
	5/24/2017			
Comment	# of Clusters = 8, # of Shots = 58			
Volume Slurry Total (gal)	516,835.20			
Treat Pressure Avg (psi)	Treat Pressure Max (psi)	Slurry Rate Avg (bbl/min)	Slurry Rate Max (bbl/min)	
7,581.0	9,144.0	75.3	97.3	
Bnch/Stg	Start Date	Primary Job Type		
	5/24/2017			
Comment	# of Clusters = 8, # of Shots = 58			
Volume Slurry Total (gal)	534,794.40			
Treat Pressure Avg (psi)	Treat Pressure Max (psi)	Slurry Rate Avg (bbl/min)	Slurry Rate Max (bbl/min)	
8,398.0	9,919.0	94.9	100.9	
Bnch/Stg	Start Date	Primary Job Type		
	5/24/2017			
Comment	# of Clusters = 8, # of Shots = 58			
Volume Slurry Total (gal)	517,335.00			
Treat Pressure Avg (psi)	Treat Pressure Max (psi)	Slurry Rate Avg (bbl/min)	Slurry Rate Max (bbl/min)	
8,119.0	8,871.0	93.0	100.7	
Bnch/Stg	Start Date	Primary Job Type		
	5/25/2017			
Comment	# of Clusters = 8, # of Shots = 58			
Volume Slurry Total (gal)	19,450.20			
Treat Pressure Avg (psi)	Treat Pressure Max (psi)	Slurry Rate Avg (bbl/min)	Slurry Rate Max (bbl/min)	
6,633.0	12,537.0	17.1	33.7	
Bnch/Stg	Start Date	Primary Job Type		
	5/25/2017			
Comment	# of Clusters = 8, # of Shots = 58			
Volume Slurry Total (gal)	518,784.00			
Treat Pressure Avg (psi)	Treat Pressure Max (psi)	Slurry Rate Avg (bbl/min)	Slurry Rate Max (bbl/min)	
7,429.0	8,606.0	80.7	85.0	
Bnch/Stg	Start Date	Primary Job Type		
	5/25/2017			
Comment	# of Clusters = 8, # of Shots = 58			
Volume Slurry Total (gal)	330,934.80			
Treat Pressure Avg (psi)	Treat Pressure Max (psi)	Slurry Rate Avg (bbl/min)	Slurry Rate Max (bbl/min)	
9,222.0	13,354.0	83.0	95.6	

Frac Wellbore Schematic Report

Well Name: MND-6B-HS

HORIZONTAL - Original Hole, 12/11/2017 3:40:34 PM



Stimulation Intervals

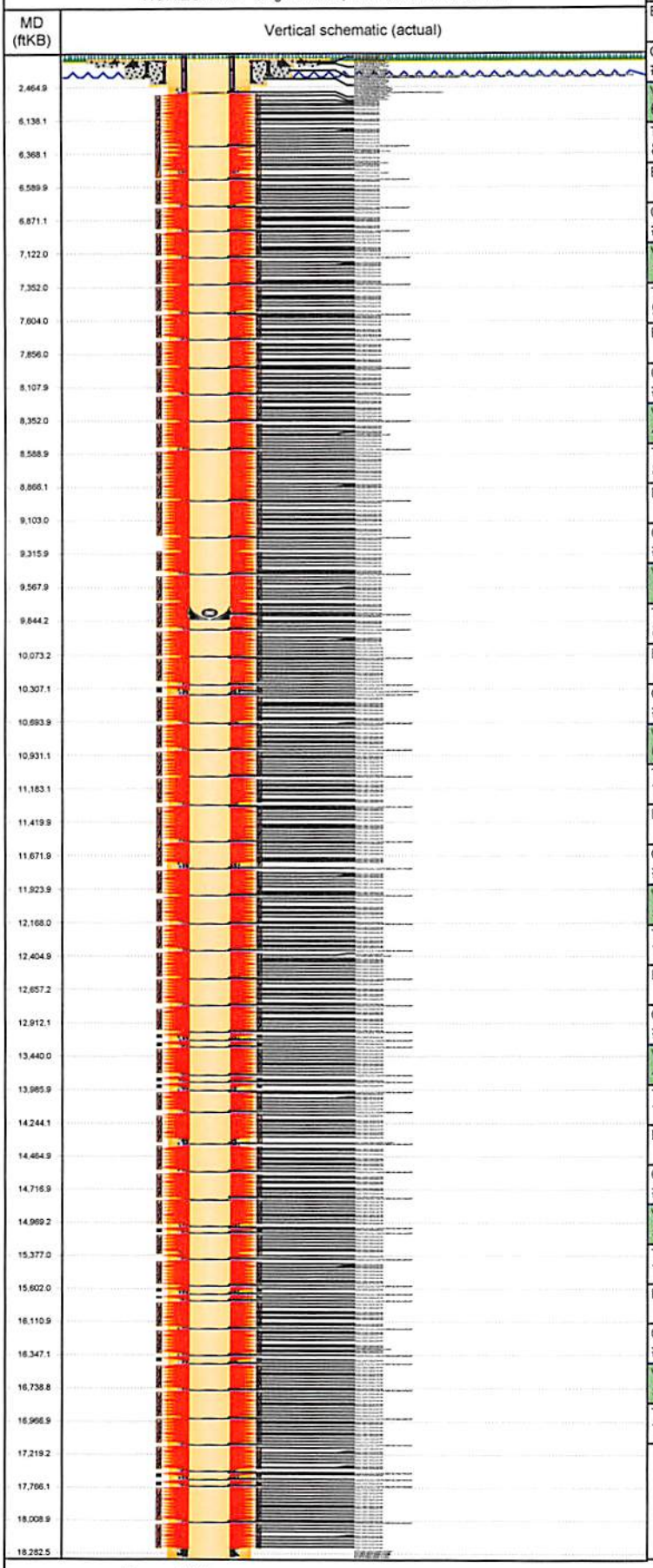
Bnch/Stg	Start Date	Primary Job Type		
	5/25/2017			
Comment	# of Clusters = 8, # of Shots = 58			
Volume Slurry Total (gal)	470,572.20			
Treat Pressure Avg (psi)	Treat Pressure Max (psi)	Slurry Rate Avg (bbl/min)	Slurry Rate Max (bbl/min)	
8,265.0	9,023.0	78.7	90.5	
Bnch/Stg	Start Date	Primary Job Type		
	5/26/2017			
Comment	# of Clusters = 8, # of Shots = 58			
Volume Slurry Total (gal)	545,655.60			
Treat Pressure Avg (psi)	Treat Pressure Max (psi)	Slurry Rate Avg (bbl/min)	Slurry Rate Max (bbl/min)	
7,768.0	9,367.0	86.4	90.7	
Bnch/Stg	Start Date	Primary Job Type		
	5/26/2017			
Comment	# of Clusters = 8, # of Shots = 58			
Volume Slurry Total (gal)	571,242.00			
Treat Pressure Avg (psi)	Treat Pressure Max (psi)	Slurry Rate Avg (bbl/min)	Slurry Rate Max (bbl/min)	
7,240.0	10,247.0	78.6	83.1	
Bnch/Stg	Start Date	Primary Job Type		
	5/26/2017			
Comment	# of Clusters = 8, # of Shots = 58			
Volume Slurry Total (gal)	502,269.60			
Treat Pressure Avg (psi)	Treat Pressure Max (psi)	Slurry Rate Avg (bbl/min)	Slurry Rate Max (bbl/min)	
8,074.0	8,525.0	94.3	100.8	
Bnch/Stg	Start Date	Primary Job Type		
	5/27/2017			
Comment	# of Clusters = 8, # of Shots = 58			
Volume Slurry Total (gal)	480,232.20			
Treat Pressure Avg (psi)	Treat Pressure Max (psi)	Slurry Rate Avg (bbl/min)	Slurry Rate Max (bbl/min)	
7,785.0	8,553.0	93.7	100.7	
Bnch/Stg	Start Date	Primary Job Type		
	5/27/2017			
Comment	# of Clusters = 8, # of Shots = 58			
Volume Slurry Total (gal)	503,693.40			
Treat Pressure Avg (psi)	Treat Pressure Max (psi)	Slurry Rate Avg (bbl/min)	Slurry Rate Max (bbl/min)	
7,831.0	8,569.0	99.1	100.6	
Bnch/Stg	Start Date	Primary Job Type		
	5/27/2017			
Comment	# of Clusters = 8, # of Shots = 58			
Volume Slurry Total (gal)	603,741.60			
Treat Pressure Avg (psi)	Treat Pressure Max (psi)	Slurry Rate Avg (bbl/min)	Slurry Rate Max (bbl/min)	
7,937.0	8,999.0	95.6	101.2	
Bnch/Stg	Start Date	Primary Job Type		
	5/27/2017			
Comment	# of Clusters = 8, # of Shots = 58			
Volume Slurry Total (gal)	472,529.40			
Treat Pressure Avg (psi)	Treat Pressure Max (psi)	Slurry Rate Avg (bbl/min)	Slurry Rate Max (bbl/min)	
7,638.0	9,231.0	90.9	100.2	
Bnch/Stg	Start Date	Primary Job Type		
	5/27/2017			
Comment	# of Clusters = 8, # of Shots = 58			
Volume Slurry Total (gal)	468,942.60			
Treat Pressure Avg (psi)	Treat Pressure Max (psi)	Slurry Rate Avg (bbl/min)	Slurry Rate Max (bbl/min)	
7,648.0	8,809.0	89.3	95.5	

Frac Wellbore Schematic Report

noble energy

Well Name: MND-6B-HS

HORIZONTAL - Original Hole, 12/11/2017 3:40:35 PM



Stimulation Intervals

Bnch/Stg	Start Date	Primary Job Type		
	5/28/2017			
Comment	# of Clusters = 8, # of Shots = 58			
Volume Slurry Total (gal)	681,135.00			
Treat Pressure Avg (psi)	Treat Pressure Max (psi)	Slurry Rate Avg (bbl/min)	Slurry Rate Max (bbl/min)	
8,166.0	9,722.0	81.0	100.3	
Bnch/Stg	Start Date	Primary Job Type		
	5/28/2017			
Comment	# of Clusters = 8, # of Shots = 58			
Volume Slurry Total (gal)	146,223.00			
Treat Pressure Avg (psi)	Treat Pressure Max (psi)	Slurry Rate Avg (bbl/min)	Slurry Rate Max (bbl/min)	
9,706.0	10,468.0	60.9	84.8	
Bnch/Stg	Start Date	Primary Job Type		
	5/28/2017			
Comment	# of Clusters = 8, # of Shots = 58			
Volume Slurry Total (gal)	499,329.60			
Treat Pressure Avg (psi)	Treat Pressure Max (psi)	Slurry Rate Avg (bbl/min)	Slurry Rate Max (bbl/min)	
8,052.0	10,341.0	92.5	86.5	
Bnch/Stg	Start Date	Primary Job Type		
	5/28/2017			
Comment	# of Clusters = 8, # of Shots = 58			
Volume Slurry Total (gal)	137,877.60			
Treat Pressure Avg (psi)	Treat Pressure Max (psi)	Slurry Rate Avg (bbl/min)	Slurry Rate Max (bbl/min)	
8,935.0	9,585.0	59.8	79.5	
Bnch/Stg	Start Date	Primary Job Type		
	5/28/2017			
Comment	# of Clusters = 8, # of Shots = 58			
Volume Slurry Total (gal)	648,417.00			
Treat Pressure Avg (psi)	Treat Pressure Max (psi)	Slurry Rate Avg (bbl/min)	Slurry Rate Max (bbl/min)	
7,618.0	8,872.0	64.5	85.2	
Bnch/Stg	Start Date	Primary Job Type		
	5/29/2017			
Comment	# of Clusters = 8, # of Shots = 58			
Volume Slurry Total (gal)	535,042.20			
Treat Pressure Avg (psi)	Treat Pressure Max (psi)	Slurry Rate Avg (bbl/min)	Slurry Rate Max (bbl/min)	
7,496.0	9,482.0	88.2	100.6	
Bnch/Stg	Start Date	Primary Job Type		
	5/30/2017			
Comment	# of Clusters = 8, # of Shots = 58			
Volume Slurry Total (gal)	456,834.00			
Treat Pressure Avg (psi)	Treat Pressure Max (psi)	Slurry Rate Avg (bbl/min)	Slurry Rate Max (bbl/min)	
7,481.0	9,333.0	87.4	100.5	
Bnch/Stg	Start Date	Primary Job Type		
	5/30/2017			
Comment	# of Clusters = 8, # of Shots = 58			
Volume Slurry Total (gal)	519,300.60			
Treat Pressure Avg (psi)	Treat Pressure Max (psi)	Slurry Rate Avg (bbl/min)	Slurry Rate Max (bbl/min)	
7,127.0	9,214.0	97.2	100.7	
Bnch/Stg	Start Date	Primary Job Type		
	5/30/2017			
Comment	# of Clusters = 8, # of Shots = 58			
Volume Slurry Total (gal)	504,932.40			
Treat Pressure Avg (psi)	Treat Pressure Max (psi)	Slurry Rate Avg (bbl/min)	Slurry Rate Max (bbl/min)	
7,142.0	8,588.0	97.3	100.7	

Frac Wellbore Schematic Report

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Well Name: MND-6B-HS

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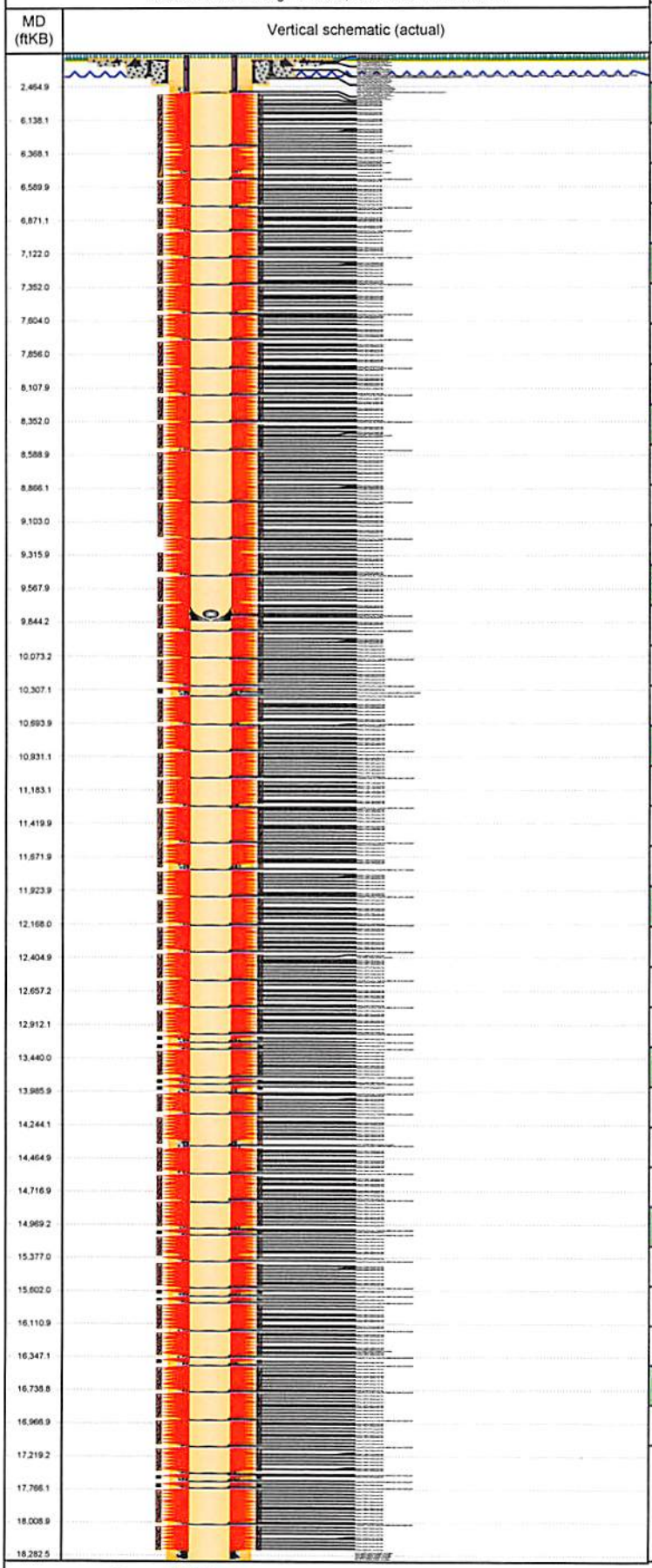


Stimulation Intervals

Bnch/Stg	Start Date	Primary Job Type
	5/30/2017	

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

Volume Slurry Total (gal)			
606,849.60			
Treat Pressure Avg (psi)	Treat Pressure Max (psi)	Slurry Rate Avg (bbl/min)	Slurry Rate Max (bbl/min)
7,141.0	8,399.0	95.7	100.6

Bnch/Stg	Start Date	Primary Job Type
	5/31/2017	

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

Volume Slurry Total (gal)			
587,193.60			
Treat Pressure Avg (psi)	Treat Pressure Max (psi)	Slurry Rate Avg (bbl/min)	Slurry Rate Max (bbl/min)
7,324.0	8,375.0	96.4	100.8

Bnch/Stg	Start Date	Primary Job Type
	5/31/2017	

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

Volume Slurry Total (gal)			
489,148.80			
Treat Pressure Avg (psi)	Treat Pressure Max (psi)	Slurry Rate Avg (bbl/min)	Slurry Rate Max (bbl/min)
7,193.0	9,013.0	95.0	100.1

Bnch/Stg	Start Date	Primary Job Type
	5/31/2017	

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

Volume Slurry Total (gal)			
550,947.60			
Treat Pressure Avg (psi)	Treat Pressure Max (psi)	Slurry Rate Avg (bbl/min)	Slurry Rate Max (bbl/min)
6,370.0	8,260.0	84.7	88.9

Bnch/Stg	Start Date	Primary Job Type
	5/31/2017	

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

Volume Slurry Total (gal)			
586,378.80			
Treat Pressure Avg (psi)	Treat Pressure Max (psi)	Slurry Rate Avg (bbl/min)	Slurry Rate Max (bbl/min)
7,033.0	8,448.0	93.4	100.0

Bnch/Stg	Start Date	Primary Job Type
	6/1/2017	

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

Volume Slurry Total (gal)			
551,283.60			
Treat Pressure Avg (psi)	Treat Pressure Max (psi)	Slurry Rate Avg (bbl/min)	Slurry Rate Max (bbl/min)
7,143.0	8,331.0	95.8	100.5

Bnch/Stg	Start Date	Primary Job Type
	6/1/2017	

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

Volume Slurry Total (gal)			
501,694.20			
Treat Pressure Avg (psi)	Treat Pressure Max (psi)	Slurry Rate Avg (bbl/min)	Slurry Rate Max (bbl/min)
6,793.0	8,975.0	90.3	94.3

Bnch/Stg	Start Date	Primary Job Type
	6/1/2017	

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

Volume Slurry Total (gal)			
438,026.40			
Treat Pressure Avg (psi)	Treat Pressure Max (psi)	Slurry Rate Avg (bbl/min)	Slurry Rate Max (bbl/min)
7,088.0	9,196.0	90.3	96.1

Bnch/Stg	Start Date	Primary Job Type
	6/1/2017	

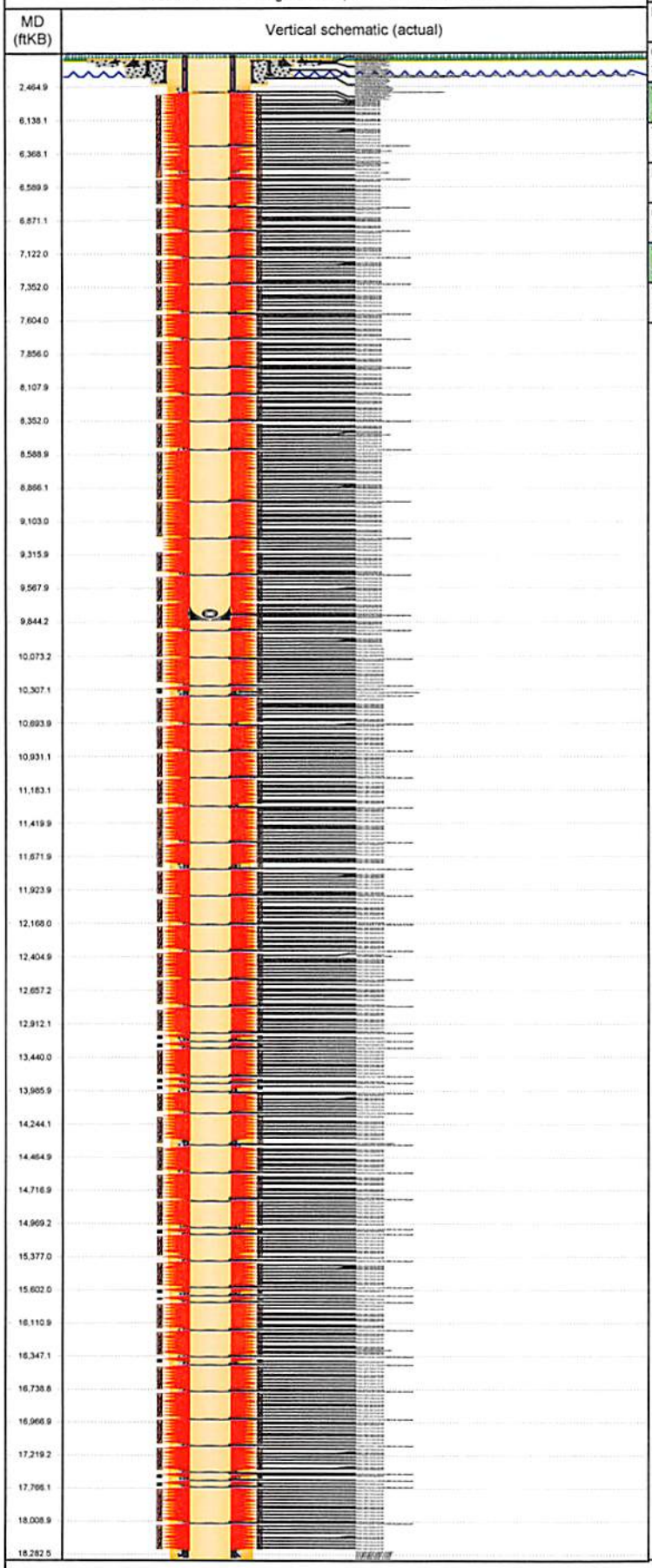
Comment: # of Clusters = 8, # of Shots = 58

Volume Slurry Total (gal)			
569,553.60			
Treat Pressure Avg (psi)	Treat Pressure Max (psi)	Slurry Rate Avg (bbl/min)	Slurry Rate Max (bbl/min)
7,384.0	9,175.0	76.9	85.3

Frac Wellbore Schematic Report

Well Name: MND-6B-HS

HORIZONTAL - Original Hole, 12/11/2017 3:40:36 PM



Stimulation Intervals

Bnch/Stg	Start Date	Primary Job Type
	6/2/2017	

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

Volume Slurry Total (gal)
564,593.40

Treat Pressure Avg (psi)	Treat Pressure Max (psi)	Slurry Rate Avg (bbl/min)	Slurry Rate Max (bbl/min)
6,876.0	8,844.0	94.5	98.7

Bnch/Stg	Start Date	Primary Job Type
	6/2/2017	

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

Volume Slurry Total (gal)
491,597.40

Treat Pressure Avg (psi)	Treat Pressure Max (psi)	Slurry Rate Avg (bbl/min)	Slurry Rate Max (bbl/min)
6,421.0	7,397.0	97.2	100.6

WR-35
Rev. 8/23/13

API 47- 051 - 01744 Farm name Consolidated Coal Company Well number MND 06 BHS

PRODUCING FORMATION(S)	DEPTHS			
Marcellus	5,940	TVD	18,369	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 _____ 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		

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 Dr City Canonsburg State PA Zip 15317

Cementing Company Schlumberger
Address 4600 J. Barry Ct., Ste. 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	

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Shale	8254	8341	8890	8983	
Clinton Sand	8341	8355	8983	8998	
Shale	8355	8424	8998	9073	
Medina Sand	8424	8523	9073	9179	
Queenston Shale	8523	9280	9179	9995	
Reedsville Shale	9280	9898	9995	10660	Gas
Utica Shale	9898	10511	10660	not encountered	
Point Pleasant	10511	10631	not encountered	not encountered	
Trenton Limestone	10631		not encountered	not encountered	

Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date:	5/14/2017
Job End Date:	6/2/2017
State:	West Virginia
County:	Marshall
API Number:	47-051-01744-00-00
Operator Name:	Noble Energy, Inc.
Well Name and Number:	MND 6 B
Latitude:	39.81764444
Longitude:	-80.79176000
Datum:	NAD27
Federal Well:	NO
Indian Well:	NO
True Vertical Depth:	5,912
Total Base Water Volume (gal):	33,603,358
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	88.47245	Density = 8.340
Ingredients	Listed Above	Listed Above					
			Water	7732-18-5	100.00000	0.17538	

OILPERM A	Halliburton	Non-ionic Surfactant					
				Listed Below			
SAND-PREMIUM WHITE-40/70	Halliburton	Proppant					
				Listed Below			
FE-1A ACIDIZING COMPOSITION	Halliburton	Additive					
				Listed Below			
SP BREAKER	Halliburton	Breaker					
				Listed Below			
SAND-COMMON WHITE-100 MESH	Halliburton	Proppant					
				Listed Below			
HAI-OS ACID INHIBITOR	Halliburton	Corrosion Inhibitor					
				Listed Below			
WG-36 GELLING AGENT	Halliburton	Gelling Agent					
				Listed Below			
HYDROCHLORIC ACID	Halliburton	Solvent					
				Listed Below			

FR-76	Halliburton	Friction Reducer					
				Listed Below			
SC-30	X-Chem	Scale Inhibitor					
				Listed Below			
B-84	X-Chem	Biocide					
				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	11.30465	
			Hydrochloric acid	7647-01-0	7.50000	0.08564	
			Guar gum	9000-30-0	100.00000	0.02057	
			Inorganic salt	Proprietary	30.00000	0.01632	
			Hydrotreated light petroleum distillate	64742-47-8	30.00000	0.01632	
			Acrylamide acrylate copolymer	Proprietary	30.00000	0.01632	Denise Tuck, Halliburton, 3000 N. Sam Houston Pkwy E., Houston, TX 77032, 281-871-6226
			Acetic anhydride	108-24-7	100.00000	0.00317	
			Acetic acid	64-19-7	60.00000	0.00190	
			Ethanol	64-17-5	60.00000	0.00064	
			Sodium persulfate	7775-27-1	100.00000	0.00044	
			Oxyalkylated phenolic resin	Proprietary	30.00000	0.00043	
			Heavy aromatic petroleum naphtha	64742-94-5	30.00000	0.00032	
			Methanol	67-56-1	60.00000	0.00031	
			Modified thiourea polymer	Proprietary	30.00000	0.00016	
			Fatty acids, tall oil	Proprietary	30.00000	0.00016	

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			Ethoxylated alcohols	Proprietary	30.00000	0.00016	
			Olefins	Proprietary	5.00000	0.00006	
			Naphthalene	91-20-3	5.00000	0.00005	
			Poly(oxy-1,2-ethanediyl), alpha-(4-nonylphenyl)-omega-hydroxy-, branched	127087-87-0	5.00000	0.00005	
			Propargyl alcohol	107-19-7	10.00000	0.00005	
			1,2,4 Trimethylbenzene	95-63-6	1.00000	0.00001	
			Sodium sulfate	7757-82-6	0.10000	0.00000	
			Glutaraldehyde	111-30-8	30.00000		
			Ethanol	64-17-5	5.00000		
			Sodium Hydroxide	1310-73-2	1.50000		
			n-Alkyl dimethyl benzyl ammonium chloride	68424-85-1	10.00000		
			Didecyl dimethyl ammonium chloride	7173-51-5	10.00000		
			Water	7732-18-5	100.00000		

* 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)