KOLAR Document ID: 1365812

Confidentiality Requested:
☑ Yes ☐ No

KANSAS CORPORATION COMMISSION
OIL & GAS CONSERVATION DIVISION

Form ACO-1
January 2018
Form must be Typed
Form must be Signed
All blanks must be Filled

WELL COMPLETION FORM
WELL HISTORY - DESCRIPTION OF WELL & LEASE

OPERATOR: License # 5474
Name: Northern Lights Oil Company, LLC
Address 1: PO BOX 164
Address 2:
City: ANDOVER State: KS Zip: 67002 + 0164
Contact Person: ROBERT SUTHERLAND
Phone: (316) 733-1515
CONTRACTOR: License # 33350
Name: Southwind Drilling, Inc.
Wellsite Geologist: JEFF CHRISTIAN
Purchaser:

Designate Type of Completion:
☑ New Well ☐ Re-Entry ☐ Workover
☐ Oil ☐ WSW ☐ SWD
☐ Gas ☑ DH ☐ EOR
☐ OG ☐ GSW
☐ CM *(Coal Bed Methane)*
☐ Cathodic ☐ Other *(Core, Expl., etc.)*:

If Workover/Re-entry: Old Well Info as follows:
Operator:
Well Name:
Original Comp. Date: Original Total Depth:
☐ Deepening ☐ Re-perf. ☐ Conv. to EOR ☐ Conv. to SWD
☐ Plug Back ☐ Liner ☐ Conv. to GSW ☐ Conv. to Producer

☐ Commingled Permit #:
☐ Dual Completion Permit #:
☐ SWD Permit #:
☐ EOR Permit #:
☐ GSW Permit #:

8/15/2017	8/22/2017	8/22/2017
Spud Date or Recompletion Date	Date Reached TD	Completion Date or Recompletion Date

API No.: 15-165-22149-00-00
Spot Description:
NW - SE - SW - SE Sec. 15 Twp. 17 S. R. 20 ☐ East ☑ West
582 Feet from ☐ North / ☑ South Line of Section
1708 Feet from ☑ East / ☐ West Line of Section
Footages Calculated from Nearest Outside Section Corner:
☐ NE ☐ NW ☑ SE ☐ SW
GPS Location: Lat: *(e.g. xx.xxxxx)* , Long: *(e.g. -xxx.xxxxx)*
Datum: ☐ NAD27 ☐ NAD83 ☐ WGS84
County: Rush
Lease Name: VOLANDIA Well #: 1
Field Name:
Producing Formation: NA
Elevation: Ground: 2122 Kelly Bushing: 2130
Total Vertical Depth: 4015 Plug Back Total Depth:
Amount of Surface Pipe Set and Cemented at: 250 Feet
Multiple Stage Cementing Collar Used? ☐ Yes ☑ No
If yes, show depth set: Feet
If Alternate II completion, cement circulated from:
feet depth to: w/ sx cmt.

Drilling Fluid Management Plan
(Data must be collected from the Reserve Pit)
Chloride content: 4000 ppm Fluid volume: 480 bbls
Dewatering method used: Hauled to Disposal
Location of fluid disposal if hauled offsite:
Operator Name: BARRACUDE
Lease Name: NORTH A#1 License #: 33593
Quarter NE Sec. 8 Twp. 20 S. R. 21 ☐ East ☑ West
County: NESS Permit #: D15859

AFFIDAVIT
I am the affiant and I hereby certify that all requirements of the statutes, rules and regulations promulgated to regulate the oil and gas industry have been fully complied with and the statements herein are complete and correct to the best of my knowledge.

Submitted Electronically

KCC Office Use ONLY
☑ **Confidentiality Requested**
Date: 09/08/2017
☑ **Confidential Release Date:** 09/08/2019
☑ **Wireline Log Received** ☑ **Drill Stem Tests Received**
☑ **Geologist Report / Mud Logs Received**
☐ **UIC Distribution**
ALT ☐ I ☑ II ☐ III **Approved by:** Karen Ritter **Date:** 09/14/2017

Operator Name: Northern Lights Oil Company, LLC Lease Name: VOLANDIA Well #: 1

Sec. 15 Twp. 17 S. R. 20 ☐ East ☑ West County: Rush

INSTRUCTIONS: Show important tops of formations penetrated. Detail all cores. Report all final copies of drill stems tests giving interval tested, time tool open and closed, flowing and shut-in pressures, whether shut-in pressure reached static level, hydrostatic pressures, bottom hole temperature, fluid recovery, and flow rates if gas to surface test, along with final chart(s). Attach extra sheet if more space is needed.

Final Radioactivity Log, Final Logs run to obtain Geophysical Data and Final Electric Logs must be emailed to kcc-well-logs@kcc.ks.gov. Digital electronic log files must be submitted in LAS version 2.0 or newer AND an image file (TIFF or PDF).

Drill Stem Tests Taken *(Attach Additional Sheets)*	☑ Yes	☐ No
Samples Sent to Geological Survey	☑ Yes	☐ No
Cores Taken	☐ Yes	☑ No
Electric Log Run	☑ Yes	☐ No
Geologist Report / Mud Logs	☑ Yes	☐ No

List All E. Logs Run:

RAG

☐ Log Formation (Top), Depth and Datum ☐ Sample

Name	Top	Datum
ANHYDRITE	1367	763
HEEBNER	3506	-1376
LANSING	3549	-1419
PAWNEE	3913	-1783
CHER SD	3987	-1857

CASING RECORD ☑ New ☐ Used

Report all strings set-conductor, surface, intermediate, production, etc.

Purpose of String	Size Hole Drilled	Size Casing Set (In O.D.)	Weight Lbs. / Ft.	Setting Depth	Type of Cement	# Sacks Used	Type and Percent Additives
Surface	12.25	8.625	20	250	60/40 POZ	160	3%cc 2%gel

ADDITIONAL CEMENTING / SQUEEZE RECORD

Purpose:	Depth Top Bottom	Type of Cement	# Sacks Used	Type and Percent Additives
☐ Perforate ☐ Protect Casing ☐ Plug Back TD ☐ Plug Off Zone	-			
	-			

1. Did you perform a hydraulic fracturing treatment on this well? ☐ Yes ☑ No *(If No, skip questions 2 and 3)*
2. Does the volume of the total base fluid of the hydraulic fracturing treatment exceed 350,000 gallons? ☐ Yes ☐ No *(If No, skip question 3)*
3. Was the hydraulic fracturing treatment information submitted to the chemical disclosure registry? ☐ Yes ☐ No *(If No, fill out Page Three of the ACO-1)*

Date of first Production/Injection or Resumed Production/ Injection:	Producing Method: ☐ Flowing ☐ Pumping ☐ Gas Lift ☐ Other *(Explain)*

Estimated Production Per 24 Hours	Oil Bbls.	Gas Mcf	Water Bbls.	Gas-Oil Ratio	Gravity

DISPOSITION OF GAS:	METHOD OF COMPLETION:	PRODUCTION INTERVAL:
☐ Vented ☐ Sold ☐ Used on Lease *(If vented, Submit ACO-18.)*	☐ Open Hole ☐ Perf. ☐ Dually Comp. *(Submit ACO-5)* ☐ Commingled *(Submit ACO-4)*	Top / Bottom

Shots Per Foot	Perforation Top	Perforation Bottom	Bridge Plug Type	Bridge Plug Set At	Acid, Fracture, Shot, Cementing Squeeze Record *(Amount and Kind of Material Used)*

TUBING RECORD: Size: Set At: Packer At:

Mail to: KCC - Conservation Division, 266 N. Main, Suite 220, Wichita, Kansas 67202

Form	ACO1 - Well Completion
Operator	Northern Lights Oil Company, LLC
Well Name	VOLANDIA 1
Doc ID	1365812

Casing

Purpose Of String	Size Hole Drilled	Size Casing Set	Weight	Setting Depth	Type Of Cement	Number of Sacks Used	Type and Percent Additives
Surface	12.25	8.625	20	250	60/40 POZ	160	3%cc 2%gel

QUALITY OILWELL CEMENTING, INC.

Federal Tax I.D.# 20-2886107

Phone 785-483-2025
Cell 785-324-1041

Home Office P.O. Box 32 Russell, KS 67665

No. 363

Date	Sec.	Twp.	Range	County	State	On Location	Finish
8-16-17	15	17	20	Rush	KS		12:15 A.m.

Location McCracken 2E 1S 1/2E N into

Lease Volandia	Well No. 1	Owner	
Contractor Southwind #3		To Quality Oilwell Cementing, Inc. You are hereby requested to rent cementing equipment and furnish cementer and helper to assist owner or contractor to do work as listed.	
Type Job Surface			
Hole Size 12 1/4	T.D. 250	Charge To Northern Lights Oil	
Csg. 8 5/8	Depth 249	Street	
Tbg. Size	Depth	City	State
Tool	Depth	The above was done to satisfaction and supervision of owner agent or contractor.	
Cement Left in Csg. 10'	Shoe Joint	Cement Amount Ordered 160 80/20 3% cc 2% gel	
Meas Line	Displace 15 Bbl		

EQUIPMENT

	No.		
Pumptrk 20	No.	Cementer	Craig
		Helper	
Bulktrk	No.	Driver	Brett
		Driver	
Bulktrk 15	No.	Driver	Jordan
		Driver	

JOB SERVICES & REMARKS

Remarks:
Rat Hole
Mouse Hole
Centralizers
Baskets
D/V or Port Collar

8 5/8 on bottom est. Circulation
Mix 160sk + Displace
Cement Circulated

Item	
Common	
Poz. Mix	
Gel.	
Calcium	
Hulls	
Salt	
Flowseal	
Kol-Seal	
Mud CLR 48	
CFL-117 or CD110 CAF 38	
Sand	
Handling	
Mileage	

FLOAT EQUIPMENT

Item	
Guide Shoe 8 5/8 Baffle	
Centralizer	
Baskets	
AFU Inserts	
Float Shoe	
Latch Down	
Pumptrk Charge	
Mileage	
Tax	
Discount	
Total Charge	

X
Signature Joey Thrun

Jeff Christian
PETROLEUM GEOLOGIST
Wichita, Kansas

GEOLOGICAL REPORT
DRILLING TIME AND SAMPLE LOG

OPERATOR NORTHERN LIGHTS OIL CO.
LEASE VOLANDIA # 1
LOCATION 582' FSL & 1708' FEL
SEC. 15 TWSP 17 S RNG 20 W
COUNTY RUSH STATE KANSAS
FIELD WILDCAT
API 15-165-22149-00-00

CONTRACTOR SOUTHWIND RIG NO. 3
DRILLING STARTED 08-15-2017 COMPLETED 08/21/2017
MUD DISPLACED 3150' MUD TYPE CHEMICAL
DRILLING TIME KEPT FROM 3200' TO RTD
SAMPLES SAVED FROM 3200' TO RTD
SAMPLES EXAMINED FROM 3200' TO RTD
GEOLOGICAL SUPERVISION FROM 3328' TO RTD

FORMATION NAME	LOG TOP	LOG DATUM	SAMPLE TOP	SAMPLE DATUM
ANHYDRITE	1363'	(+767)	1367'	(+763)
BASE ANHYDRITE	1394'	(+736)	1398'	(+732)
HEEBNER	3500'	(-1370)	3506'	(-1376)
LANSING	3544'	(-1414)	3549'	(-1419)
BKC	3814'	(-1684)	3818'	(-1688)
PAWNEE	3904'	(-1774)	3913'	(-1783)
LABETTE SH.	3954'	(-1824)	3965'	(-1835)
CHEROKEE SD.	3981'	(-1851)	3987'	(1857)
TOTAL DEPTH	4012'	(-1882)	4015'	(-1885)

ELEVATIONS
KB 2130'
GL 2122'
MEASUREMENTS FROM K.B.

CASING RECORD
Conductor NONE
Surface 8 5/8' @ 250'
W/ 160 SX
Production NONE

ELECTRICAL SURVEYS:
PIONEER:
RADIATION/GUARD

15

DATE	7:00 AM DEPTH	REMARKS
8/15/17	MIRT	SPUD
8/16/17	250'	WOC dev. 0 deg.
8/17/17	1910'	DRLG
8/18/17	2830'	DRLG
8/19/17	3510'	DRLG
8/20/17	3944'	DRLG
8/21/17	3990'	OB w/ DST # 2, RTD 4015' @ 11:30 am, dev. 1 deg. @ 3983'
		Finish logging 5:00 pm

Remarks

The Volandia # 1 was declared dry and abandoned.

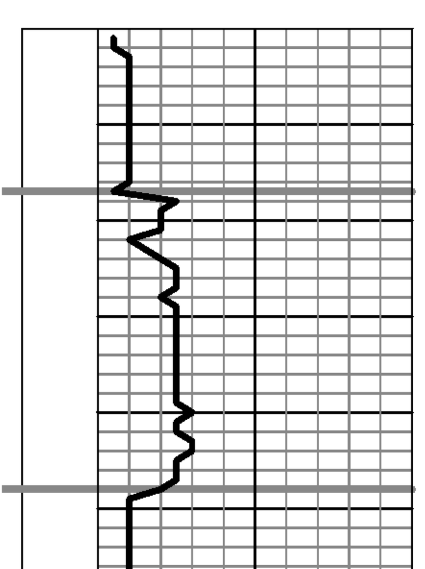
Electric log measurements correlate about 5' to 6' high compared to drilling measurements.

Samples delivered to the Kansas Geological Survey in Wichita, KS.

Respectfully Submitted,

Jeff Christian

LITH.	0 DRILL TIME (MIN/FT) 10	DEPTH	SHW	SAMPLE DESCRIPTIONS	REMARKS



1350

1400

ANHYDRITE 1367' (+763)
E Log 1363' (+767)

Base ANHYDRITE 1398' (+732)
E Log 1394' (+736)

3200

Ls: lt brn-lt gry, fn xln, foss-mott, sct pp-vug por, ns

Andy's Mud: 3150'; 8/18/17
Wt. 9.3, Vis. 55, WL.9.2, Chl.3000, LCM.4

Ls: crm-lt brn-lt gry, fn xln, part chlky, part dns, foss, pr vis por, ns

Same

Ls: lt brn-lt gry, fn xln, part dns, foss-ool in part, pr vis por, ns

3250

Ls: crm-lt brn-lt gry, fn xln, sli grnlr, ool in part, vy sct intrxln-pp por, ns

Ls: lt brn-lt gry, fn xln, dns, sli foss, pr vis por, ns

Ls: as above w/ sct wt chlk

Ls: crm-lt brn-lt gry, fn xln, sli grnlr, foss, chrty, fr intrxln-pp por, ns

3300

Same

Ls: crm-lt brn-lt gry, fn xln, sli grnlr, foss, chrty, sct fr intrxln-vug por, ns

Sh: blk, carb

3350

Ls: lt brn-lt gry, fn xln, sli grnlr, part dns, foss, pr vis por, ns

Ls: crm-lt brn, fn xln, sli grnlr, sli foss, sli chrty, sct fr intrxln-pp por, ns

Ls: crm-lt gry, fn xln, dns, sli foss, sli chrty, pr vis por, ns

3400

Same

Sh: gry-grn- trc blk, carb

Ls: lt brn-lt gry, fn xln, sli grnlr, sli foss, pr vis por, ns

Ls: crm-lt brn-lt gry, fn xln, sli grnlr, part dns, foss-sli ool, sct fr intrxln-pp por, ns

3450

Ls: crm-lt brn-lt gry, fn xln, sli grnlr, sli foss, sct chrt, pr-fr pp por, ns w/ sct wt chlk

Same

Ls: as above w/ abndnt wt chlk

Same

3500

HEEBNER 3505' (-1375)
E Log 3500' (-1370)

Sh: blk, carb

Sh: gry-grn-red

TORONTO 3523' (-1393)
E Log 3518' (-1388)

Ls: crm-lt gry, fn xln, part dns, sli foss, pr pp-vug por, ns

Same

3550

LANSING 3549' (-1419)
E Log 3544' (-1414)

Ls: crm-lt gry, fn xln, sli chlky, few pcs dolo, sli chrty, vy sct intrxln-pp por, ns

No Smpl

Ls: lt brn, fn xln, ool-oomld, fr-gd oomld-introol por, ns

Ls: lt brn-lt gry, fn xln, oomld-sli ool, fr oomld por, ns

3600

Andy's Mud: 3610'; 8/19/17
Wt. 9.5, Vis. 56, WL.8, Chl.4000, LCM.5

Sh: blk, carb

Ls: crm-lt gry, fn xln, subchlky, sli foss, sli chrty, pr vis por, ns

Ls: crm-lt gry, fn xln, dns, sli foss, abndnt wt chlk

3650

Ls: crm-lt gry, fn xln, subchlky, sli foss, vy chrty (wt, fresh, opq, ool in part), vy sct intrfoss-vug por, ns

Ls: crm-lt gry, fn xln, dns,subchlky, sct chrt, pr vis por, ns

Sh: gry-gn-red

3700

Ls: crm-lt gry, fn xln, dns, chrty (lt brn, fresh, subtrns, pr vis por, ns

Same

Ls: crm-lt brn, fn xln, ool-oomld, fr oomld-introol por, ns

Sh: gry-gn-red

3750

Ls: crm-lt gry, fn xln, subchlky, part dns, ool-oomld, chrty, fr oomld por, ns

Sh: gn-red

Ls: crm-lt brn-lt gry, fn xln, subchlky, part dns, pr vis por, ns

Same

3800

Ls: crm-lt gry, fn xln, sub chlky, dns w/ chrt, lt brn-orng, pr vis por, ns

BKC 3819' (-1689)
E Log 3814' (-1684)

Sh: gry-gn-red

Ls: crm-lt brn-lt gry, fn xln, part dns, part chlky, chrty, trc ool, pr vis por, ns w/ Sh: gry-red-gn

Sh: red-gry-gn

3850

Same

Ls: crm-lt gry, fn xln, dns w/ abndnt orng chrt, pr vis por, ns

Sh: gry-gn-red/brn

Pipe Strap @ 3983': 1.33' long to board
Dev. 1 deg.

Ls: crm-lt gry, fn xln, dns, chlky in part, sct orng chrt, pr vis por, ns

Andy's Mud: 3960'; 8/20/17
Wt. 9.8, Vis. 60, WL.8.8, Chl.4000, LCM.3

3900

Sh: gry-gn-red/brn

PAWNEE 3909' (-1779)
E Log 3904' (-1774)

Ls: lt gry, fn xln, dns w/ lt orng, sli grnlr chrt, pr vis por, ns

DST # 1 3957' to 3983'
30"-45"-30"-45"
IF: Blow Built to 2.5" ISI: No Return
FF: Blow Built to .25" FSI: No Return
RECOVERY: 105' total fluid
45' WM w/ scum of oil (40%W,60%M)
60' MW (65%W,35%M)
IFP: 21-43# ISIP: 608#
FFP: 47-67# FSIP: 585#
IHP: 2089# FHP: 1958#
BHT: 115 deg. F.
Chl: 32,000 ppm

Ls: lt gry-gry, fn xln, dns, sct chrt, lt orng-crm, pr vis por, ns

Ls: lt-drk gry, fn xln, dns, sct chrt, pr vis por, ns

3950

Ls: as above, slty in part

LABETTE SH. 3960' (-1830)
E Log 3954' (-1824)

Sh: drk gry-red-gn, trc blk, carb

LABETTE SD. 3972' (-1842)
E Log 3966' (-1836)

Sst: few clstrs, clr-lt gry, vy fn-fn grn, subrnd, fr srt, calc, fri-hrd, fr por, some w/ frsfo, no odor, lt brn stn, sli fluor, some barren w/ fr amnt loose sd grns

Sst: clr-lt gry, vy fn-fn grn, subfri, fr por, 1 clstr: gsgfo, no odor, brn stn, few clstrs: fn-med grn, subang, sli pyrit, , calc, pr por, ns w/ fr amnt loose sd grns

CHEROKEE SD. 3987' (-1857)
E Log 3981' (-1851)

loose Sd grns: clr-some yell-orng tnt, fn-crs, sct chrt, orng-yell, frsh, nso, no odor, no fluor

4000

loose Sd: as above, incrs Chrt: crm-yell-orng, nso, no odor, no fluor

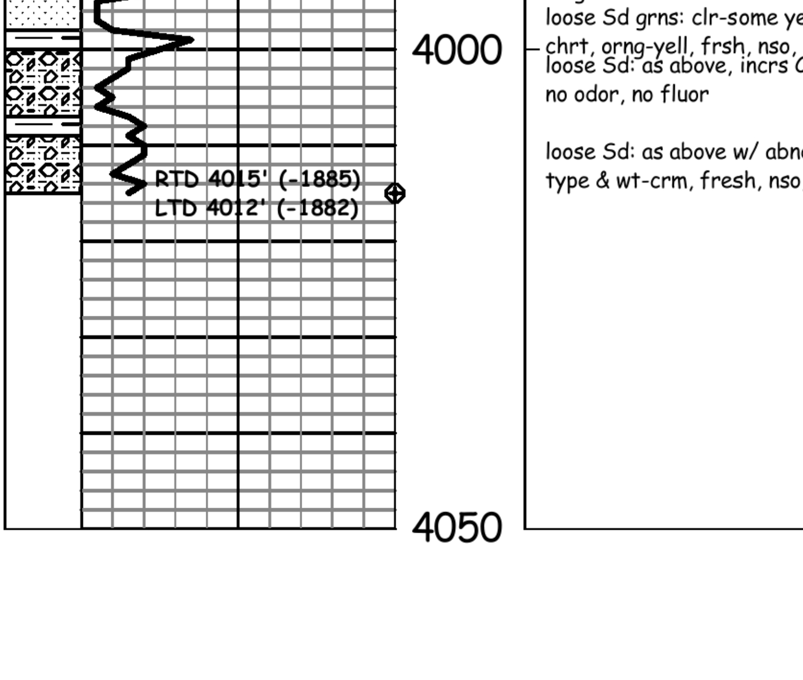
loose Sd: as above w/ abndnt Chrt: yell-orng, cgl type & wt-crm, fresh, nso, no odor, no fluor

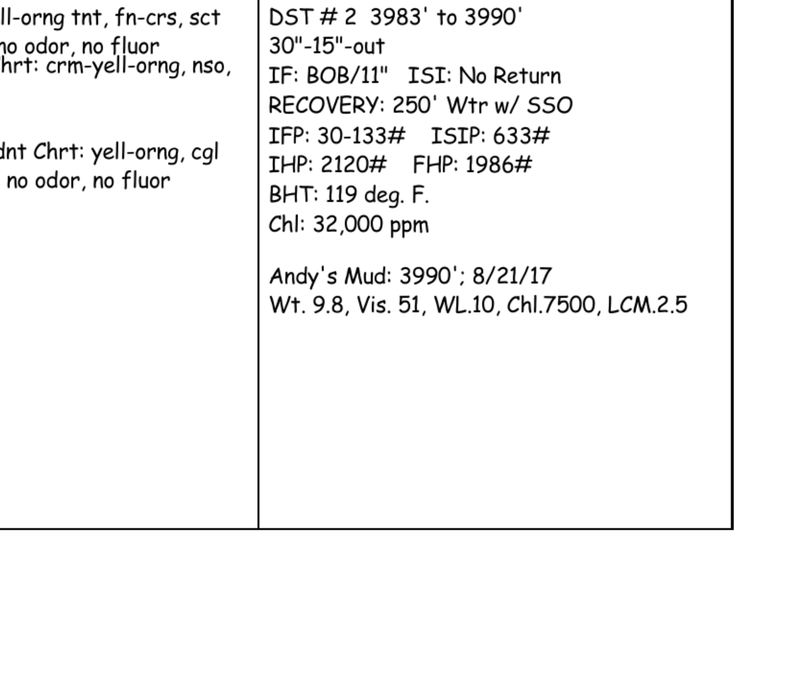
DST # 2 3983' to 3990'
30"-15"-out
IF: BOB/11" ISI: No Return
RECOVERY: 250' Wtr w/ SSO
IFP: 30-133# ISIP: 633#
IHP: 2120# FHP: 1986#
BHT: 119 deg. F.
Chl: 32,000 ppm

Andy's Mud: 3990'; 8/21/17
Wt. 9.8, Vis. 51, WL.10, Chl.7500, LCM.2.5

4050

Drill Stem Test Charts





"One Tuff Mudder"
ANDY'S MUD & CHEMICAL CO., LLC
"GO WITH THE EXPERIENCE"

Engineer	Brandon Mendez
E-Mail	[redacted]
Phone	785-625-3531 Office 785-656-3259 Cell

DRILLING MUD REPORT

REPORT NO.	1	DATE	8/16/2017	DEPTH	400

OPERATOR	Nothern Lights Oil Company,. LLC.	CONTRACTOR	Southwind Drilling	RIG NO.	3
ADDRESS	Company	ADDRESS	Rig	SPUD DATE	
REPORT FOR	Roberth Sutherland	REPORT FOR	Jay Krier	SEC,TWN,RNG	15-17-20W
WELL NAME AND NO.	Volandia #1	COUNTY AREA	Rush	STATE	Kansas

DRILLING ASSEMBLY				CASING				MUD VOLUME (BBL)			
Bit Size	7 7/8	No. Bits	2	Surface				Hole	75.2	Pits	400
Drill Pipe Size	4 1/2	Weight on Bit	30,000	8 5/8 @	250	ft.		Total Circulating Volume			475.2
Type	XH	Flowing Temp.		Intermediate				Mud Up Depth			2900
Drill Collar Size	6 1/4			@		ft.		Mud Type			Chemical-Pac
Bit RPM	60			Production				Activity			Drilling
Sample from flowline	X	Pit		@		ft.		Pits Used			3

MUD PROPERTIES		CIRCULATION DATA							
Time Sample Taken	1030am	Pump Size	6X14			Annular Vel (Ft/Min)			
Depth (ft.)	400	Pump Model		Assumed Eff.	90%	DP	197	DC	356
Weight (ppg)	8.6	Bbl/Stroke	0.139	Stroke/Min.	60	Circulation Pressure (PSI)		800	
Mud Gradient (psi/ft.)	0.4472	Bbl/Min	8.34	Gal/Min.	350	**Bottoms Up (Min.)**		9.0	
Funnel Viscosity (sec/qt.)	28	Elevation	2126ft			**Total Circ Time (Min.)**		57.0	
Plastic Viscosity		**Recommended tour treatment**							
Yield Point (lb./100 sq. ft.		**Daily Cost**	**$503.08**			**Total**		**$502.80**	
Gel Strength (lb./100 sq. ft.) 10 sec./10 min.		**Product**	**On Hand**	**Add Del.**	**Used**	**Cost**			
pH (Strip)		Premium Gel	262		18				
Filtrate API (ml./30 min.)		Hulls	64		6				
API HP-HT Filtrate (ml/30 min.)	XXX	Soda Ash	30						
Cake Thickness 32nd in. API	1/32	Caustic	15						
Alkalinity, Mud (Pm)		Lignite	12						
Alkalinity, Filtrate (Pf/Mf)		Lime	3						
Chlorides (ppm)	1500	Drispac	5						
Calcium (ppm)	220	Desco	2						
Sand Content (% by Vol.)	TR	PHPA	2						
Solids Content (% by Vol.)		Barite							
Oil Content (% by Vol.)	XXX	Cedar Fiber							
Water Content (% by Vol.)	100	Pol-E-Flake							
LCM, #/bbl									
Methylene Blue Capacity	XXX	**MUD PROPERTIES SPECIFICATIONS**							
REMARKS		**Weight**	**< 9.5**	**Viscosity**	**36**	**Filtrate**	**NC**		

" Thank You "

Keep Hole Full at all times

Call with any issues or complications
785-656-3259

Drill all sands slowly

If losing fluid pull 5 stands then work to get return back

RECOMMENDED TOUR TREATMENT

Under surface jet often and run plenty of water to keep mud weight below 9.5

Displace at 3000ft or 100ft before first samples

Have frac, #2 pit and premix full when ready to displace

~Premix to 80bbls water
3 soda ash, 1/4 pac, 22 gel,5 bar, 1 caustic, 1 lig, 4 hulls

~Use PHPA at drillstring for tight connections

~Run 100bbls freshwater flush and 3 viscups phpa before displacing

Reserve Pit Chlorides=	**ppm.**	**Calcium=**	**ppm.**	**Volume=**	**bbls.**

"One Tuff Mudder"
ANDY'S MUD & CHEMICAL CO., LLC
"GO WITH THE EXPERIENCE"

Engineer	Brandon Mendez
E-Mail	[redacted]
Phone	785-625-3531 Office 785-656-3259 Cell

DRILLING MUD REPORT

REPORT NO.	2	DATE	8/17/2017	DEPTH	2035

OPERATOR	Nothern Lights Oil Company,. LLC.	CONTRACTOR	Southwind Drilling	RIG NO.	3
ADDRESS	Company	ADDRESS	Rig	SPUD DATE	
REPORT FOR	Roberth Sutherland	REPORT FOR	Jay Krier	SEC,TWN,RNG	15-17-20W
WELL NAME AND NO.	Volandia #1	COUNTY AREA	Rush	STATE	Kansas

DRILLING ASSEMBLY			
Bit Size	7 7/8	No. Bits	2
Drill Pipe Size	4 1/2	Weight on Bit	30,000
Type	XH	Flowing Temp.	
Drill Collar Size	6 1/4		
Bit RPM	60		
Sample from flowline	X	Pit	

CASING		
Surface		
8 5/8 @	250	ft.
Intermediate		
@		ft.
Production		
@		ft.

MUD VOLUME (BBL)			
Hole	178.2	Pits	400
Total Circulating Volume			578.2
Mud Up Depth			2900
Mud Type			Chemical-Pac
Activity			Drilling
Pits Used			3

MUD PROPERTIES	
Time Sample Taken	745am
Depth (ft.)	2035
Weight (ppg)	9.7
Mud Gradient (psi/ft.)	0.5044
Funnel Viscosity (sec/qt.)	28
Plastic Viscosity	
Yield Point (lb./100 sq. ft.	
Gel Strength (lb./100 sq. ft.) 10 sec./10 min.	
pH (Strip)	
Filtrate API (ml./30 min.)	
API HP-HT Filtrate (ml/30 min.)	XXX
Cake Thickness 32nd in. API	1/32
Alkalinity, Mud (Pm)	
Alkalinity, Filtrate (Pf/Mf)	
Chlorides (ppm)	100000
Calcium (ppm)	890
Sand Content (% by Vol.)	TR
Solids Content (% by Vol.)	
Oil Content (% by Vol.)	XXX
Water Content (% by Vol.)	100
LCM, #/bbl	
Methylene Blue Capacity	XXX

CIRCULATION DATA							
Pump Size	6X14			Annular Vel (Ft/Min)			
Pump Model		Assumed Eff.	90%	DP	197	DC	356
Bbl/Stroke	0.139	Stroke/Min.	60	Circulation Pressure (PSI)		800	
Bbl/Min	8.34	Gal/Min.	350	**Bottoms Up (Min.)**		21.4	
Elevation	2126ft			**Total Circ Time (Min.)**		69.3	

Recommended tour treatment

Daily Cost	$5,062.90	Total	$5,565.70
Product	**On Hand**	**Add Del.**	**Used**	**Cost**
Premium Gel	262		120	
Hulls	64		12	
Soda Ash	30		15	
Caustic	15		6	
Lignite	12		6	
Lime	3		1	
Drispac	5		2	
Desco	2		0	
PHPA	2		0	
Barite	80		25	
Cedar Fiber				
Pol-E-Flake				

MUD PROPERTIES SPECIFICATIONS					
Weight	< 9.5	Viscosity	36	Filtrate	NC

REMARKS

" Thank You "

Keep Hole Full at all times

Call with any issues or complications
785-656-3259

Drill all sands slowly

If losing fluid pull 5 stands then work to get return back

Call 100ft before displacement! I needed to be here for it 785-656-3259

RECOMMENDED TOUR TREATMENT

Under surface jet often and run plenty of water to keep mud weight below 9.5

Displace at 3000ft or 100ft before first samples

Have frac, #2 pit and premix full when ready to displace

~Premix to 80bbls water
3 soda ash, 1/4 pac, 22 gel, 5 bar, 1 caustic, 1 lig, 4 hulls

~Use PHPA at drillstring for tight connections

~Run 100bbls freshwater flush and 3 viscups phpa before displacing

Reserve Pit Chlorides=	ppm.	Calcium=	ppm.	Volume=	bbls.

"One Tuff Muddier"
ANDY'S MUD & CHEMICAL CO., LLC
"GO WITH THE EXPERIENCE"

Engineer	Brandon Mendez
E-Mail	[redacted]
Phone	785-625-3531 Office 785-656-3259 Cell

DRILLING MUD REPORT

REPORT NO.	3	DATE	8/17/2017	DEPTH	2424

OPERATOR	Nothern Lights Oil Company,. LLC.	CONTRACTOR	Southwind Drilling	RIG NO.	3
ADDRESS	Company	ADDRESS	Rig	SPUD DATE	
REPORT FOR	Roberth Sutherland	REPORT FOR	Jay Krier	SEC,TWN,RNG	15-17-20W
WELL NAME AND NO.	Volandia #1	COUNTY AREA	Rush	STATE	Kansas

DRILLING ASSEMBLY

Bit Size	7 7/8	No. Bits	2
Drill Pipe Size	4 1/2	Weight on Bit	30,000
Type	XH	Flowing Temp.	
Drill Collar Size	6 1/4		
Bit RPM	60		
Sample from flowline	X	Pit	

CASING

Surface		
8 5/8 @	250	ft.
Intermediate		
@		ft.
Production		
@		ft.

MUD VOLUME (BBL)

Hole	202.7	Pits	400
Total Circulating Volume			602.7
Mud Up Depth			2900
Mud Type			Chemical-Pac
Activity			Drilling
Pits Used			3

MUD PROPERTIES

Time Sample Taken	520pm
Depth (ft.)	2424
Weight (ppg)	9.8
Mud Gradient (psi/ft.)	0.5096
Funnel Viscosity (sec/qt.)	30
Plastic Viscosity	
Yield Point (lb./100 sq. ft.	
Gel Strength (lb./100 sq. ft.) 10 sec./10 min.	
pH (Strip)	
Filtrate API (ml./30 min.)	
API HP-HT Filtrate (ml/30 min.)	XXX
Cake Thickness 32nd in. API	1/32
Alkalinity, Mud (Pm)	
Alkalinity, Filtrate (Pf/Mf)	
Chlorides (ppm)	86000
Calcium (ppm)	750
Sand Content (% by Vol.)	TR
Solids Content (% by Vol.)	
Oil Content (% by Vol.)	XXX
Water Content (% by Vol.)	100
LCM, #/bbl	
Methylene Blue Capacity	XXX

CIRCULATION DATA

Pump Size	6X14			Annular Vel (Ft/Min)	
Pump Model		Assumed Eff.	90%	DP 197	DC 356
Bbl/Stroke	0.139	Stroke/Min.	60	Circulation Pressure (PSI)	800
Bbl/Min	8.34	Gal/Min.	350	Bottoms Up (Min.)	24.3
Elevation	2126ft			Total Circ Time (Min.)	72.3

Recommended tour treatment

Daily Cost		Total		$5,565.70
Product	On Hand	Add Del.	Used	Cost
Premium Gel	262			
Hulls	64			
Soda Ash	30			
Caustic	15			
Lignite	12			
Lime	3			
Drispac	5			
Desco	2			
PHPA	2			
Barite	80			
Cedar Fiber				
Pol-E-Flake				

MUD PROPERTIES SPECIFICATIONS

Weight	< 9.5	Viscosity	36	Filtrate	NC

REMARKS

" Thank You "

Keep Hole Full at all times

Call with any issues or complications
785-656-3259

Drill all sands slowly

If losing fluid pull 5 stands then work to get return back

Call 100ft before displacement! I needed to be here for it 785-656-3259

RECOMMENDED TOUR TREATMENT

Under surface jet often and run plenty of water to keep mud weight below 9.5

Displace at 3000ft or 100ft before first samples

Have frac, #2 pit and premix full when ready to displace

~Premix to 80bbls water
3 soda ash, 1/4 pac, 22 gel,60 bar, 1 caustic, 1 lig, 10 hulls

~Suck another 80bbls mud from frac tank and mix 65 barite to tank with 4 hulls
~mix slowly to ensure all barite mix and does not settle at bottom of premix

Reserve Pit Chlorides=	ppm.	Calcium=	ppm.	Volume=	bbls.

"One Tuff Muddder"
ANDY'S MUD & CHEMICAL CO., LLC
"GO WITH THE EXPERIENCE"

Engineer	Brandon Mendez
E-Mail	bmendeztuffmudder@gmail.com
Phone	785-625-3531 Office 785-656-3259 Cell

DRILLING MUD REPORT

REPORT NO.	4	DATE	8/17/2017	DEPTH	3150

OPERATOR	Nothern Lights Oil Company,. LLC.	CONTRACTOR	Southwind Drilling	RIG NO.	3
ADDRESS	Company	ADDRESS	Rig	SPUD DATE	8/15/2017
REPORT FOR	Roberth Sutherland	REPORT FOR	Jay Krier	SEC,TWN,RNG	15-17-20W
WELL NAME AND NO.	Volandia #1	COUNTY AREA	Rush	STATE	Kansas

DRILLING ASSEMBLY			
Bit Size	7 7/8	No. Bits	2
Drill Pipe Size	4 1/2	Weight on Bit	30,000
Type	XH	Flowing Temp.	
Drill Collar Size	6 1/4		
Bit RPM	60		
Sample from flowline	X	Pit	

CASING		
Surface		
8 5/8 @	250	ft.
Intermediate		
@		ft.
Production		
@		ft.

MUD VOLUME (BBL)			
Hole	248.5	Pits	400
Total Circulating Volume			648.5
Mud Up Depth			3150
Mud Type			Chemical-Pac
Activity			Drilling
Pits Used			3

MUD PROPERTIES	
Time Sample Taken	6pm
Depth (ft.)	3150
Weight (ppg)	9.3
Mud Gradient (psi/ft.)	0.4836
Funnel Viscosity (sec/qt.)	55
Plastic Viscosity	14
Yield Point (lb./100 sq. ft.	20
Gel Strength (lb./100 sq. ft.) 10 sec./10 min.	10/22
pH (Strip)	10.5
Filtrate API (ml./30 min.)	9.2
API HP-HT Filtrate (ml/30 min.)	XXX
Cake Thickness 32nd in. API	1/32
Alkalinity, Mud (Pm)	2.1
Alkalinity, Filtrate (Pf/Mf)	1.3
Chlorides (ppm)	3000
Calcium (ppm)	40
Sand Content (% by Vol.)	TR
Solids Content (% by Vol.)	4.7
Oil Content (% by Vol.)	XXX
Water Content (% by Vol.)	95.3
LCM, #/bbl	4#
Methylene Blue Capacity	XXX

CIRCULATION DATA							
Pump Size	6X14			Annular Vel (Ft/Min)			
Pump Model		Assumed Eff.	90%	DP	197	DC	356
Bbl/Stroke	0.139	Stroke/Min.	60	Circulation Pressure (PSI)		800	
Bbl/Min	8.34	Gal/Min.	350	**Bottoms Up (Min.)**		29.8	
Elevation	2126ft			**Total Circ Time (Min.)**		77.8	

Recommended tour treatment

Daily Cost	**$8,661.80**	**Total**		$14,227.50
Product	**On Hand**	**Add Del.**	**Used**	**Cost**
Premium Gel	105		37	
Hulls	34		18	
Soda Ash	12		3	
Caustic	8		1	
Lignite	5		1	
Lime	1		1	
Drispac	2		1	
Desco	2		0	
PHPA	0		2	
Barite	117	233	196	
Cedar Fiber				
Pol-E-Flake				

MUD PROPERTIES SPECIFICATIONS

Weight	**9.6**	**Viscosity**	**50-54**	**Filtrate**	**8-10cc**

REMARKS

Keep hole full at all times

When tripping out of hole keep pump kicked in the entire time and sack out

Before tripping out of hole mix 30 bar to pitmud and fill pipe with weighted mud

Do not shake or surge hole as it can cause water intrusion

If losing fluid pull 5 stands then work to get returns back**/call immediately**
785-656-3259
~Watch connections closely
~Monitor fluid levels

RECOMMENDED TOUR TREATMENT

Maintain viscosity of 50 -54 while drilling and for DST/LOG

Keep weight at 9.6/ run water as needed to rehydrate mud but do not get carried away as we will need to maintain weight.

Maintain 6#LCM

For volume premix to 80bbls water
3 soda ash, 22-25 gel, 1 caustic, 1 lig, 1/2 pac, 30 barite, 20 hulls
~Let tank roll for 20 mins/ add over 1.5 hours through pump/ get #2 cut in

~If tank is not needed for volume mix 20 hulls to pitmud

~If needed for vis premix to 1/2 pitmud 1/2 freshwater
3 soda ash, 20-24 gel, 1 caustic, 1 lig, 1/3 pac, 10 hulls(if wt is 9.5 or better no bar needed)
~Let tank roll for 20 mins/add over 1.5 hrs through pump

Reserve Pit Chlorides=	**57000ppm.**	**Calcium=**	**990ppm.**	**Volume=**	**400bbls.**

"One Tuff Mudder"
ANDY'S MUD & CHEMICAL CO., LLC
"GO WITH THE EXPERIENCE"

Engineer	Brandon Mendez
E-Mail	[redacted]
Phone	785-625-3531 Office 785-656-3259 Cell

DRILLING MUD REPORT

REPORT NO.	5	DATE	8/18/2017	DEPTH	3610

OPERATOR	Nothern Lights Oil Company,. LLC.	CONTRACTOR	Southwind Drilling	RIG NO.	3
ADDRESS	Company	ADDRESS	Rig	SPUD DATE	8/15/2017
REPORT FOR	Roberth Sutherland	REPORT FOR	Jay Krier	SEC,TWN,RNG	15-17-20W
WELL NAME AND NO.	Volandia #1	COUNTY AREA	Rush	STATE	Kansas

DRILLING ASSEMBLY			
Bit Size	7 7/8	No. Bits	2
Drill Pipe Size	4 1/2	Weight on Bit	30,000
Type	XH	Flowing Temp.	
Drill Collar Size	6 1/4		
Bit RPM	60		
Sample from flowline	X	Pit	

CASING		
Surface		
8 5/8 @	250	ft.
Intermediate		
@		ft.
Production		
@		ft.

MUD VOLUME (BBL)			
Hole	277.4	Pits	400
Total Circulating Volume			677.4
Mud Up Depth			3150
Mud Type			Chemical-Pac
Activity			Drilling
Pits Used			3

MUD PROPERTIES		
Time Sample Taken	1030am	
Depth (ft.)	3610	3455
Weight (ppg)	9.5	9.8
Mud Gradient (psi/ft.)	0.494	.510
Funnel Viscosity (sec/qt.)	56	60
Plastic Viscosity	17	21
Yield Point (lb./100 sq. ft.	23	20
Gel Strength (lb./100 sq. ft.) 10 sec./10 min.	10/22	10/20
pH (Strip)	10	9.5
Filtrate API (ml./30 min.)	8	8.8
API HP-HT Filtrate (ml/30 min.)	XXX	XXX
Cake Thickness 32nd in. API	1/32	1/32
Alkalinity, Mud (Pm)	1.9	1.1
Alkalinity, Filtrate (Pf/Mf)	1	.5
Chlorides (ppm)	4000	4000
Calcium (ppm)	60	60
Sand Content (% by Vol.)	TR	TR
Solids Content (% by Vol.)	6.1	7.8
Oil Content (% by Vol.)	XXX	XXX
Water Content (% by Vol.)	93.9	92.2
LCM, #/bbl	5#	3#
Methylene Blue Capacity	XXX	

CIRCULATION DATA							
Pump Size	6X14			Annular Vel (Ft/Min)			
Pump Model		Assumed Eff.	90%	DP	197	DC	356
Bbl/Stroke	0.139	Stroke/Min.	60	Circulation Pressure (PSI)		800	
Bbl/Min	8.34	Gal/Min.	350	**Bottoms Up (Min.)**		33.3	
Elevation	2126ft			**Total Circ Time (Min.)**		81.2	

Recommended tour treatment

Daily Cost	[redacted]	Total	$15,433.15

Product	On Hand	Add Del.	Used	Cost
Premium Gel	~~105~~ 83		23	
Hulls	~~34~~ 24	30	20	
Soda Ash	~~12~~ 9		3	
Caustic	~~8~~ 7		1	
Lignite	~~5~~ 4		1	
Lime	~~1~~ 1		0	
Drispac	~~2~~ 2		0	
Desco	~~2~~ 2		0	
PHPA	~~0~~ 0		0	
Barite	107		10	
Cedar Fiber				
Pol-E-Flake				

MUD PROPERTIES SPECIFICATIONS					
Weight	9.6	Viscosity	50-54	Filtrate	8-10cc

REMARKS

Keep hole full at all times

When tripping out of hole keep pump kicked in the entire time and sack out

Before tripping out of hole mix 30 bar to pitmud and fill pipe with weighted mud

Do not shake or surge hole as it can cause water intrusion

If losing fluid pull 5 stands then work to get returns back**/call immediately**
785-656-3259

~ Watch fluid levels closely
~Watch connections for water flow

RECOMMENDED TOUR TREATMENT

Maintain viscosity of 50 -54 while drilling and for DST/LOG

Keep weight at 9.6/ run water as needed to rehydrate mud but do not get carried away as we will need to maintain weight.

Maintain 6#LCM

Suck up pitmud and mix 10 hulls

*if not testing here premix to 1/2 pitmud
1/2 freshwater 8-10 gel 1/3 pac
3 soda 20 hulls
2 caustic
1 lig

~If needed for vis premix to pitmud
15-18 gel, 2 soda ash, 1 caustic, 1 lig, rest of open sack pac, 10 hulls

Reserve Pit Chlorides=	57000ppm.	Calcium=	990ppm.	Volume=	400bbls.

ANDY'S "Mud Doctor"
MUD & CHEMICAL CO. L.L.C.
785-625-3531
HAYS, KANSAS 67601

DRILLING MUD REPORT

REPORT NO. 7

DATE 8-21 20 17 | DEPTH 3990

APT WELL NO. | STATE | COUNTY | WELL | S/T

OPERATOR Northern Lights Oil, LLC.	CONTRACTOR Southwind Drilling	RIG NO. 3
ADDRESS Co	ADDRESS Rig	SPUD DATE 8/15/17
REPORT FOR MR. Robert Sutherland	REPORT FOR MR. Jay Krier	SECTION, TOWNSHIP, RANGE 15-17-20W
WELL NAME AND NO. Volandia #1	FIELD OR BLOCK NO.	COUNTY AREA Rush / STATE Kansas

Drillling Assembly

Bit Size 7 7/8	No. Bits	Jet Size
Drill Pipe Size 4 1/2	Type	Length
Drill Collar Size 6 1/4	Length	No. Pits
Bit RPM 60	Weight on Bit 30K	
Last Bit No.	Present Activity DST	

Casing

Surface @ Ft.
Intermediate @ Ft.
Production or Liner @ Ft.

Mud Volume (BBL)

Hole 301 Pits 400
Total Circulating Volume 700
Mud Up Depth 3150
Mud Type Chemical

Circulation Data

Pump Size 6 x in. 14
Pump Make, Model | Assumed Eff. 90
Bbl/Stroke .139 Stroke/Min. 60
Bbl/Min. 8.34 Gal/Min. 350
Elevation 2126ft

Annular Vel (Ft/Min) DP 197 DC 356
Circulation Pressure (PSI) 800
Bottoms Up (Min.) 36.1
Total Circ Time (Min.) 84.1

MUD PROPERTIES

Sample from ☐ Flowline ( ) Pit
Flowing Temperature F

Time Sample Taken	750am		
Depth (ft.)	3990		
Weight ☐ (ppg) ☐ (lb./cu. ft.)	9.8		
Mud Gradient (psi/ft.)	.510		
Funnel Viscosity (sec./qt.) API at °F	51		
Plastic Viscosity cp at / °F	11		
Yield Point (lb./100 sq. ft.)	23		
Gel Strength (lb./100 sq. ft.) 10 sec./10 min.	12/20	/	/
pH ☐ Strip ☐ Meter	9.0		
Filtrate API (ml./30 min.)	10		
API HP-HT Filtrate (ml/30 min.) °F	XXX		
Cake Thickness 32nd in. API ☐ HP - HT ☐	1/32		
Alkalinity, Mud (Pm)	.6		
Alkalinity, Filtrate (Pf / Mf)	.41	/	/
Salt ☐ppm ☐gpg Chloride ☐ppm ☐gpg	7500		
Calcium ☐ ppm ☐ Gyp (ppb)	40		
Sand Content (% by Vol.)	TR		
Solids Content (% by Vol.)	8.0		
Oil Content (% by Vol.)	XXX		
Water Content (% by Vol.)	92		
LCM, #/bbl	25#		
Methylene Blue Capacity ☐ (ml/ml mud) ☐ (equiv. #/Bbl. bent.)			

Mud Used: none

Daily Cost | Cumulative Cost $15,433.15

MUD PROPERTIES SPECIFICATIONS

WEIGHT 9.7 | VISCOSITY 50-54 | FILTRATE 8-10cc

BY AUTHORITY: ☐ OPERATOR'S WRITTEN ☐ OPERATOR'S REPRESENTATIVE ☐ DRILLING CONTRACTOR ☐ OTHER

RECOMMENDED TOUR TREATMENT

- ☐ * Maintain 50-54 Vis while drilling
- ☐ * for DST/LOG
- ☐
- ☐ * Maintain 6# LCM
- ☐
- ☐ * Keep weight at 9.7
- ☐

REMARKS: - Keep hole full at all times

- When tripping out keep pump kicked in & suck out

- Do not shake pipe or surge hole

- If losing fluid pull 5 stands then work to get returns back - Call immediately (785)656-3254

- Watch fluid level closely / connections per water

* If drilling ahead premix to pit mud
- Rest of open sack pac
- 2 soda Ash
- 1 caustic
- 10-15 hulls
- 5-10 gel

TRILOBITE TESTING INC.

1515 Commerce Parkway • Hays, Kansas 67601

4/10

Test Ticket

NO. 63013

Well Name & No. Volandia #1 Test No. 1 Date 8-20-12

Company Northern Lights Oil Co. Elevation 2130 KB 2122 GL

Address PO Box 164 Andover, Ks 67002-0164

Co. Rep / Geo. Jeff Christian Rig Southwind rig 3

Location: Sec. 15 Twp. 17S Rge. 20W Co. Rush State Ks

Interval Tested 3957-3983 Zone Tested Cher. Sd

Anchor Length 26 Drill Pipe Run 3954 Mud Wt. 9.6

Top Packer Depth 3952 Drill Collars Run — Vis 59

Bottom Packer Depth 3957 Wt. Pipe Run — WL 8

Total Depth 3983 Chlorides 4000 ppm System LCM 3#

Blow Description IFP - Weak Blow Thru-out ¼" To 2½" Blow

ISIP No Blow

FFP - dead Blow 1st 7 min, Then surface To ¼" Blow

FSIP - No Blow

Rec 45	Feet of WM w/show of oil	%gas	%oil 40	%water 60	%mud
Rec 60	Feet of MW	%gas	%oil 65	%water 35	%mud
Rec	Feet of	%gas	%oil	%water	%mud
Rec	Feet of	%gas	%oil	%water	%mud
Rec	Feet of	%gas	%oil	%water	%mud

Rec Total 105 BHT 115 Gravity — API RW .25 @ 60 °F Chlorides 32000 ppm

(A) Initial Hydrostatic 2089	☑ Test	T-On Location 1520
(B) First Initial Flow 21	☑ Jars	T-Started 1615
(C) First Final Flow 43	☑ Safety Joint	T-Open 1800
(D) Initial Shut-In 608	☐ Circ Sub	T-Pulled 2030
(E) Second Initial Flow 47	☐ Hourly Standby	T-Out 2207
(F) Second Final Flow 67	☑ Mileage 80 RT	Comments
(G) Final Shut-In 585	☐ Sampler	
(H) Final Hydrostatic 1958	☐ Straddle	☐ Ruined Shale Packer
	☐ Shale Packer	☐ Ruined Packer
Initial Open 30	☐ Extra Packer	☐ Extra Copies
Initial Shut-In 45	☐ Extra Recorder	Sub Total
Final Flow 30	☐ Day Standby	Total
Final Shut-In 45	☐ Accessibility	MP/DST Disc't
	Sub Total	

Approved By Jeff Christian

Our Representative Ray Schwager

Thank You

DRILL STEM TEST REPORT

TRILOBITE TESTING, INC

Northern Lights Oil Co

PO Box 164
Andover Ks 67002-0164

ATTN: Robert.Sutherland Je

15-17s-20w Rush

Volander #1

Job Ticket: 63013 **DST#: 1**

Test Start: 2017.08.20 @ 16:15:54

GENERAL INFORMATION:

Formation: **Cher Sd**
Deviated: No Whipstock: ft (KB)
Time Tool Opened: 18:02:49
Time Test Ended: 22:07:18

Test Type: Conventional Bottom Hole (Initial)
Tester: Ray Schwager
Unit No: 77

Interval: 3957.00 ft (KB) To 3983.00 ft (KB) (TVD)
Total Depth: 3983.00 ft (KB) (TVD)
Hole Diameter: 7.85 inches Hole Condition: Fair

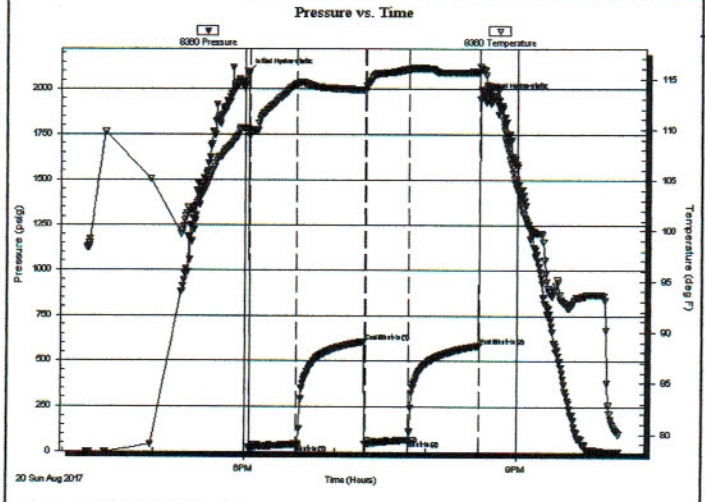
Reference Elevations: 2130.00 ft (KB)
2122.00 ft (CF)
KB to GR/CF: 8.00 ft

Serial #: 8360 **Inside**

Press@RunDepth: 67.63 psig @ 3958.00 ft (KB)
Start Date: 2017.08.20 End Date: 2017.08.20
Start Time: 16:15:54 End Time: 22:07:18

Capacity: 8000.00 psig
Last Calib.: 2017.08.20
Time On Btm: 2017.08.20 @ 18:02:04
Time Off Btm: 2017.08.20 @ 20:37:48

TEST COMMENT: 30-IFP-wk bl thru-out 1/4"to 2 1/2"bl
45-ISIP-no bl
30-dead 1st 7min then surface to 1/4"bl
45-FSIP-no bl



PRESSURE SUMMARY

Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	2089.77	110.01	Initial Hydro-static
1	21.48	109.32	Open To Flow (1)
32	43.25	114.46	Shut-In(1)
77	608.51	113.95	End Shut-In(1)
78	47.14	113.83	Open To Flow (2)
107	67.63	115.94	Shut-In(2)
153	585.62	115.68	End Shut-In(2)
156	1958.51	115.81	Final Hydro-static

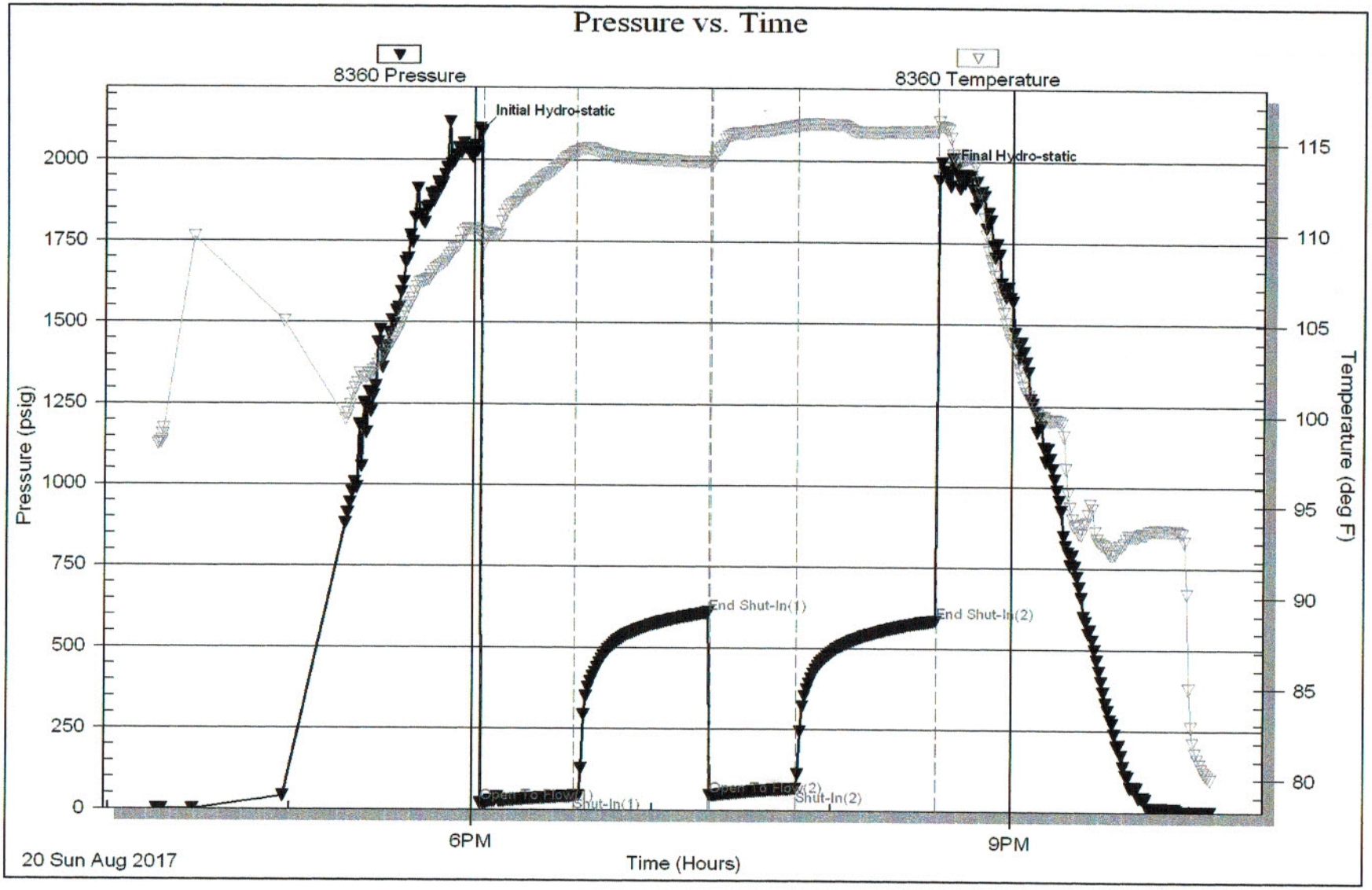
Recovery

Length (ft)	Description	Volume (bbl)
45.00	WM 40%W60%M w/show of oil	0.63
60.00	MW 35%M65%W	0.84

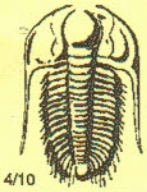
Gas Rates

	Choke (inches)	Pressure (psig)	Gas Rate (Mcf/d)

Serial #: 8360 **Inside** Northern Lights Oil Co Volander #1 DST Test Number: 1



Trilobite Testing, Inc Ref. No: 63013 Printed: 2017.08.20 @ 21:21:36



4/10

TRILOBITE TESTING INC.

1515 Commerce Parkway • Hays, Kansas 67601

Test Ticket

NO. 63014

Well Name & No. Volandia #1 Test No. 2 Date 8-21-17

Company Northern Lights Oil Co Elevation 2130 KB 2122 GL

Address PO Box 164 Andover, Ks 67002-0164

Co. Rep / Geo. Jeff Christian Rig Scout/Winding 3

Location: Sec. 15 Twp. 17 Rge. 20W Co. Rush State Ks

Interval Tested 3983-3990 Zone Tested Cher Sd.

Anchor Length 7 Drill Pipe Run 3986 Mud Wt. 9.6

Top Packer Depth 3978 Drill Collars Run — Vis 56

Bottom Packer Depth 3983 Wt. Pipe Run — WL 8

Total Depth 3990 Chlorides 4000 ppm System LCM 3#

Blow Description IFP - Weak To BoB in 11 min

ISIP - No Blow

Rec 250	Feet of Water	%gas	%oil	%water	%mud
Rec	Feet of w/slight show of oil	%gas	%oil	%water	%mud
Rec	Feet of Top of fluid	%gas	%oil	%water	%mud
Rec	Feet of	%gas	%oil	%water	%mud
Rec	Feet of	%gas	%oil	%water	%mud

Rec Total 250 BHT 119 Gravity — API RW .21 @ 70 °F Chlorides 32000 ppm

(A) Initial Hydrostatic	2120	☑ Test	T-On Location 0400
(B) First Initial Flow	30	☑ Jars	T-Started 0425
(C) First Final Flow	133	☑ Safety Joint	T-Open 0600
(D) Initial Shut-In	633	☐ Circ Sub	T-Pulled 0645
(E) Second Initial Flow	—	☐ Hourly Standby	T-Out 0830
(F) Second Final Flow	—	☑ Mileage 80RT	Comments
(G) Final Shut-In	—	☐ Sampler	
(H) Final Hydrostatic	1986	☐ Straddle	☐ Ruined Shale Packer
		☐ Shale Packer	☐ Ruined Packer
Initial Open	30	☐ Extra Packer	☐ Extra Copies
Initial Shut-In	15	☐ Extra Recorder	Sub Total
Final Flow	—	☐ Day Standby	Total
Final Shut-In	—	☐ Accessibility	MP/DST Disc't
		Sub Total	

Approved By Jeff Christian

Our Representative Ray Schwager Thank you

DRILL STEM TEST REPORT

TRILOBITE TESTING, INC

Northern Lights Oil Co

PO Box 164
Andover Ks 67002-0164

ATTN: Robert.Sutherland Je

15-17s-20w Rush

Volander #1

Job Ticket: 63014 **DST#: 2**

Test Start: 2017.08.21 @ 04:25:57

GENERAL INFORMATION:

Formation: **Cher Sd**
Deviated: No Whipstock: ft (KB)
Time Tool Opened: 05:59:07
Time Test Ended: 08:30:22

Test Type: Conventional Bottom Hole (Reset)
Tester: Ray Schwager
Unit No: 77

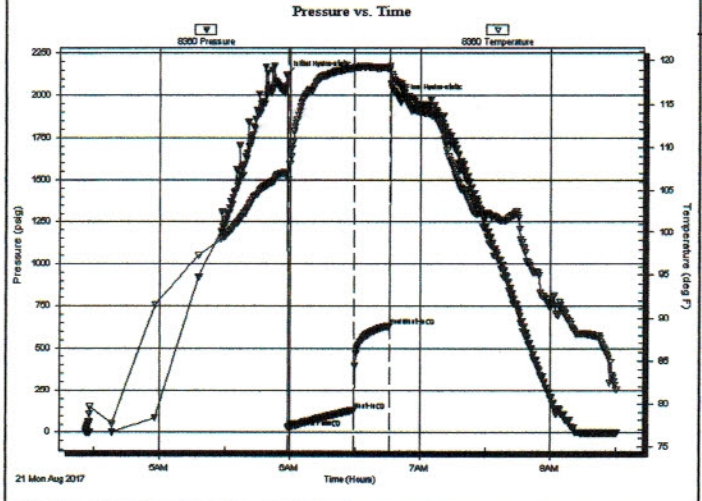
Interval: 3983.00 ft (KB) To 3990.00 ft (KB) (TVD)
Total Depth: 3990.00 ft (KB) (TVD)
Hole Diameter: 7.85 inches Hole Condition: Fair

Reference Elevations: 2130.00 ft (KB)
2122.00 ft (CF)
KB to GR/CF: 8.00 ft

Serial #: 8360 **Inside**
Press@RunDepth: 133.80 psig @ 3984.00 ft (KB)
Start Date: 2017.08.21 End Date: 2017.08.21
Start Time: 04:25:57 End Time: 08:30:22

Capacity: 8000.00 psig
Last Calib.: 2017.08.21
Time On Btm: 2017.08.21 @ 05:58:22
Time Off Btm: 2017.08.21 @ 06:49:52

TEST COMMENT: 30-IFP-wk to BOB in 11min
15-ISIP-no bl bk



PRESSURE SUMMARY

Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	2120.05	107.03	Initial Hydro-static
1	30.77	106.16	Open To Flow (1)
31	133.80	119.19	Shut-In(1)
48	633.91	118.99	End Shut-In(1)
52	1986.91	117.49	Final Hydro-static

Recovery

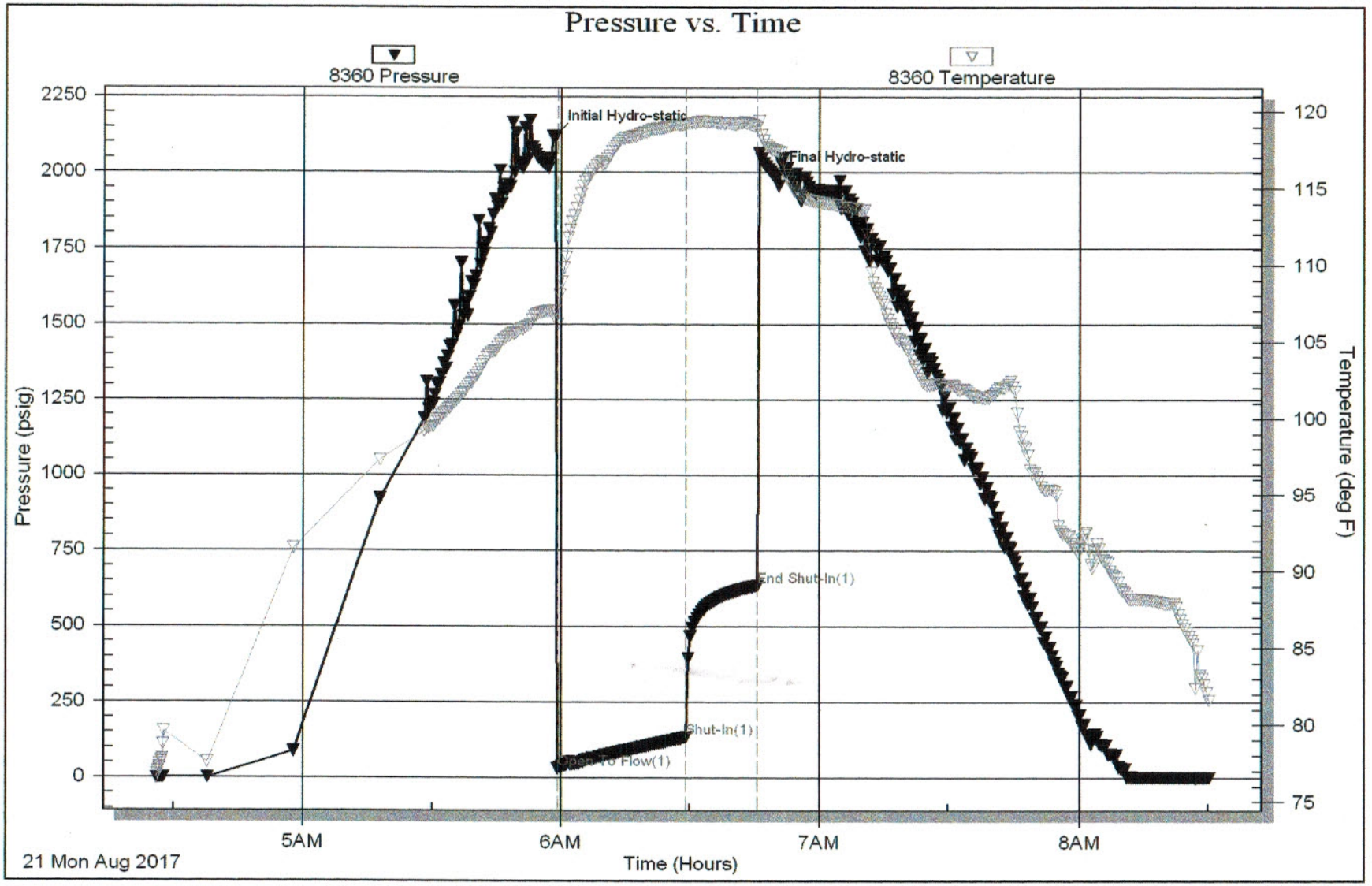
Length (ft)	Description	Volume (bbl)
250.00	Water w/slight show of oil top of fluid	3.51

* Recovery from multiple tests

Gas Rates

	Choke (inches)	Pressure (psig)	Gas Rate (Mcf/d)

Serial #: 8360 **Inside** Northern Lights Oil Co Volander #1 DST Test Number: 2



Trilobite Testing, Inc Ref. No: 63014 Printed: 2017.08.21 @ 07:37:53