SUNDRY NOTICES AND REPORTS ON WELLS - FORM 4

INDUSTRIAL COMMISSION OF NORTH DAKOTA
OIL AND GAS DIVISION
600 EAST BOULEVARD DEPT 405
BISMARCK, ND 58505-0840
SFN 5749 (09-2006)

Well File No.
28652

Received
DEC 09 2016
ND Oil & Gas Division

PLEASE READ INSTRUCTIONS BEFORE FILLING OUT FORM.
PLEASE SUBMIT THE ORIGINAL AND ONE COPY.

☐ Notice of Intent	Approximate Start Date	☐ Drilling Prognosis	☐ Spill Report
☑ Report of Work Done	Date Work Completed **November 3, 2016**	☐ Redrilling or Repair	☐ Shooting
		☐ Casing or Liner	☐ Acidizing
		☐ Plug Well	☐ Fracture Treatment
☐ Notice of Intent to Begin a Workover Project that may Qualify for a Tax Exemption Pursuant to NDCC Section 57-51.1-03.		☐ Supplemental History	☑ Change Production Method
	Approximate Start Date	☐ Temporarily Abandon	☐ Reclamation
		☐ Other	**Well is now on pump**

Well Name and Number					
Kline Federal 5300 41-18 10B					
Footages	Qtr-Qtr	Section	Township	Range	
500 F **S** L **237** F **W** L	**SWSW**	**18**	**153 N**	**100 W**	
Field	Pool	County			
Baker	**Bakken**	**McKenzie**			

24-HOUR PRODUCTION RATE

Before		After	
Oil	Bbls	Oil	Bbls
Water	Bbls	Water	Bbls
Gas	MCF	Gas	MCF

Name of Contractor(s)			
Address	City	State	Zip Code

DETAILS OF WORK

Effective 11/03/2016 the above referenced well was converted to rod pump.

End of Tubing: 2-7/8" L-80 tubing @ 10122.38'

Pump: 2-1/2" x 2.0" x 24' insert pump @ 9995.42'

Company		Telephone Number
Oasis Petroleum North America LLC		**281-404-9436**
Address		
1001 Fannin, Suite 1500		
City	State	Zip Code
Houston	**TX**	**77002**
Signature	Printed Name	
	Jennifer Swenson	
Title	Date	
Regulatory Specialist	**December 7, 2016**	
Email Address		
jswenson@oasispetroleum.com		

FOR STATE USE ONLY

☑ Received	☐ Approved
Date 1-16-2017	
By	
Title TAYLOR ROTH Engineering Technician	

Oasis Petroleum North America

Kline Federal 5300 41-18 10B

Services Performed For:

Brendan Hargrove
Oasis Petroleum North America
1001 Fannin Suite 202
Houston, TX 77002

Onsite Geology Performed by:

Annika Tostengard, Timber Solberg
RPM Geologic
geology@rpmconsultinginc.com
(303) 595-7625

WELL EVALUATION

Oasis Petroleum
Kline Federal 5300 41-18 10B
SW SW Sec. 18, T153N, R100W
Williams County, North Dakota

Synopsis

Oasis Petroleum *Kline Federal 5300 41-18 10B* [SW SW Sec. 18 T153N R100W] is located ~6 miles Northwest of the town of Williston, North Dakota. *Kline Federal 5300 41-18 10B* is situated within the Baker Field. A single lateral leg trending 90° was proposed to be drilled from the SW SW corner of Section 18 to the SE SE corner of Section 17 targeting the porous sandstone and silty sandstone of the **Middle Bakken**.

Control Wells

Two completed wells were used as the control offsets to the *Kline Federal 5300 41-18 10B*.

The primary offset considered was the *Kline Federal 5300 41-18 11T2* [SW SW Sec. 18 T153N, R100W] which is a horizontal well drilled by Oasis Petroleum. *Kline Federal 5300 41-18 11T2* is located approximately 33 feet south of *Kline Federal 5300 41-18 10B*.

The other offset considered was the *Kline Federal 5300 41-18 12TX* [SW SW Sec. 18 T153N, R100W] which is a horizontal well drilled by Oasis Petroleum. *Kline Federal 5300 41-18 12TX* is located approximately 66 feet south of *Kline Federal 5300 41-18 10B*.

During the curve, the gamma ray that was produced was constantly compared to the *Kline Federal 5300 41-18 11T2* and the *Kline Federal 5300 41-18 12TX* wells. Gamma ray was used to help determine a proper landing depth.

To assist in the choosing of the landing target, an isopach table (Table 1) was constructed to measure the distance of formation tops to the target depth determined from the *Kline Federal 5300 41-18 11T2* and *Kline Federal 5300 41-18 12TX* offset wells. Comparison of gamma ray markers showed the most consistent isopach for up-hole formations to be the **False Bakken**.

Control Well

Operator:	**Oasis Petroleum**			
Well Name:	***Kline Federal 5300 41-18 11T2***			
Location:	SW SW Sec. 18 T153N, R100W McKenzie Co., ND Approximately 25 ft South			
Elevation:	KB: 2,082'			
Formation/ Zone	**Est. TVD**	**MSL Datum**	**Thickness**	**Dist to target**
Kibbey Lime	8,382'	-6,300'	183'	2,368'
Charles Salt	8,565'	-6,483'	642'	2,185'
Base Last Salt	9,207'	-7,125'	223'	1,543'
Mission Canyon	9,430'	-7,348'	567'	1,320'
Lodgepole	9,997'	-7,915'	708'	753'
False Bakken	10,705'	-8,623'	7'	45'
Upper Bakken Shale	10,712'	-8,630'	18'	38'
Middle Bakken	10,730'	-8,648'	40'	20'

Control Well

Operator:	**Oasis Petroleum**			
Well Name:	***Kline Federal 5300 41-18 12TX***			
Location:	SW SW Sec. 18 T153N, R100W McKenzie Co., ND Approximately 50 feet South			
Elevation:	KB: 2,082'			
Formation/Zone	**Est. TVD**	**MSL Datum**	**Thickness**	**Dist to target**
Kibbey Lime	8,384	-6,302'	172'	2,361'
Charles Salt	8,556	-6,474'	650'	2,189'
Base Last Salt	9,206	-7,124'	222'	1,539'
Mission Canyon	9,428	-7,346'	547'	1,317'
Lodgepole	9,975	-7,893'	729'	770'
False Bakken	10,704	-8,622'	9'	41'
Upper Bakken Shale	10,713	-8,631'	17'	32'
Middle Bakken	10,730	-8,648'	27'	15'

Table 1: ***Distance from Formation tops in the control wells were utilized to determine an initial drilling target.***

Geologic Assessment

Methods

Geologic supervision of *Kline Federal 5300 41-18 10B* was provided by experienced RPM well site geologists. Gas and chromatograph levels were measured using NOV WellSight Gas Detection real time gas detector and chromatograph system. The WellSight gas detection system uses non-dispersive infrared and chemical sensor gas detection to evaluate gases liberated from the formation by the drill bit and carried to the surface by the drilling fluid.

The gas detector was interfaced with a RigWatch electronic data recorder system. RigWatch provided drill rate, on-off bottom and pump strokes to the gas detector and received total gas information from the gas detector for viewing on location and remotely.

Under the direction of RPM well site geologists, rig crews were instructed to catch lagged drill cutting samples at 30' intervals in the vertical hole and curve build from 8,350' to 11,175' MD and 50' samples from 11,175' to TD (20,475').

Sampled drill cuttings were examined wet and dry under a binocular microscope using both plain (broad spectrum) and transmitted light. Cuttings were evaluated for hydrocarbon "cut" by immersion in Acetone and inspection under a UV fluoroscope. 10% hydrochloric acid and alizarin red were used to determine the calcareous and dolomitic content of rocks and cementing.

RPM Geologic, Inc. (RPM) well site geologists also closely examined MWD gamma-ray information and penetration rates to aid in steering decisions and dip degree estimations.

Vertical Operations

Overview

The *Kline Federal 5300 41-18 10B* was spud for surface drilling on 9 September 2014 utilizing Nabors 486 as the drilling contractor. Prior to commencement of RPM mud logging services, a 17 1/2" hole was drilled with fresh water to depth of 2,125' and isolated with 13 3/8" 54# J-55 casing cemented from 2,083' to surface. To ensure hole stability a 12 ¼" hole was drilled to a depth of 6,140' and 40# 8 5/8 casing was set at 6,125'.

RPM well site geologists began logging the vertical interval at 8,350'.

Two PDC bit were used to drill out of secondary casing casing to vertical TD. PDC bit #1 (8 ¾" Varel) was used to drill from 2,140' to 9,9500' and averaged an ROP of 62 ft/hr in 61.5 hours of use. A second Varel PDC bit was used to continue drilling to a vertical TD of 10,240' MD in 4.5 hours with an average penetration rate of 64.4 ft/hr

Diesel invert drilling fluid with a mud weight ranging from 9.80-9.90 ppg was used for the remainder of the vertical hole and in the curve builds sections. The vertical interval was drilled to a kick off point (KOP) of 10,450', at which point vertical operations were ceased.

Lithology

The top of the **Kibbey Lime** [Mississippian Madison Group] was picked at 8,376' (-6,294'), 6' high to the *Kline Federal 5300 41-18 11T2*. Samples from this interval (Figure 1) were described as:

> LIMESTONE: wackestone, light gray to medium gray, light gray brown to medium gray brown, occasional off white friable to firm, crystalline to microcrystalline

*Figure 1: Photograph of Limestone seen in sample from the **Kibby Limestone** formation.*

The top of the **Charles Salt** [Mississippian Madison Group] was logged at 8,566' (-6,484'), 1' low to the *Kline Federal 5300 41-18 11T2*. The **Base Last Salt** was drilled at 9,206' (-7,123'), 2' high to the *Kline Federal 5300 41-18 11T2*. Samples from this interval (Figure 2) were described as:

> SALT: translucent, trace off white, crystalline, firm, crystalline texture, no visible porosity, no visible oil stain
>
> LIMESTONE: wackestone, light gray to medium gray, light gray brown to medium gray brown, occasional off white friable to firm, crystalline to microcrystalline
>
> ANHYDRITE: off white, cream, soft to firm, amorphous texture, no visible porosity

*Figure 2: Photograph of Salt seen in sample from the **Charles** formation.*

The top of the **Mission Canyon** formation of the Madison Group [Mississippian] was reached at 9,428' (-7,346'), 2' high to the *Kline Federal 5300 41-18 11T2*. Samples from this interval (Figure 3) were described as:

> LIMESTONE: wackestone, light gray to medium gray, light gray brown to medium gray brown, occasional off white friable to firm, crystalline to microcrystalline

*Figure 3: Photograph of limestone from the **Mission Canyon** formation.*

The top of the **Lodgepole** formation of the Madison Group (Mississippian) was logged at 9,980' (-7,898'), 17' high to the *Kline Federal 5300 41-18 11T2*. Samples from this interval (Figure 4) were described as:

> ARGILLACEOUS LIMESTONE: wackestone, medium gray brown to light gray brown, firm, crystalline texture, trace sparry calcareous, carbonaceous, possible intercrystalline porosity, possible slightly light brown spotty oil stain

*Figure 4: Photograph of argillaceous limestone from **Lodgepole** formation.*

Directional Operations

Gyrodata provided equipment and personnel for MWD teams, while RPM Consulting provided directional personnel. RPM geologists worked closely with RPM directional as well as Gyrodata MWD teams to formulate steering decisions to maximize the footage of borehole in the pay zone.

Curve Build

Overview

Two PDC bits were used to build the curve section. Bit #3 was an 8 ¾" Security bit used to drill the curve from a measured depth of 10,240' to 10,859' in 17.5 hours, averaging 34.50 ft/hr. Bit #4 (8 ¾" Security) was used to drill the curve from a measured depth of 10,859' to 11,175' in

10.5 hours, averaging 30.1 ft/hr. 7" 32# P-110 casing was set to 11,037' MD upon completion of the curve.

A Chart was constructed for the curve (Chart 1) that compared the isopach of certain easily recognizable gamma markers from the **Kibbey Lime** to **Middle Bakken** on the control well *Kline Federal 5300 41-18 11T2* and *Kline Federal 5300 41-18 12TX* to the *Kline Federal 5300 41-18 10B* as marker picks were made. This chart shows the **False Bakken** top being very close in thickness to target based on the offset wells, and was the main point used to make changes to the target landing depth during the curve. The curve was completed at a measured depth of 11,175'and TVD of 10,752', ~19 feet below the base of the **Upper Bakken Shale**.

***Chart 1:* Comparing distances from gamma markers on the offset wells to markers in gamma in the curve.**

Lithology

The top of the **"False Bakken"** was drilled at a measured depth of 10,864' (TVD 10,708') (-8,626') 3' low to the *Kline Federal 5300 41-18 11T2*.

The *Upper Shale* of the **Bakken** formation [Mississippian – Devonian] was drilled at 10,890' MD (10,716' TVD) (-8,634') with sample returns of black, carbonaceous, and petroliferous shale (Figure 5) characterized by gamma ray values in excess of 255 API counts. The *Upper Shale* was 4' lolw to the *Kline Federal 5300 41-18 11T2*. Samples were described as:

> SHALE: black, firm, earthy to waxy texture, pyrite, carbonaceous, platy, visible fracture porosity

*Figure 5: Photograph sample from the **Upper Bakken Shale.***

The *Middle Member* of the **Bakken** formation was penetrated at 10,954' MD, (10,733' TVD) (-8,651'), 3' low to the *Kline Federal 5300 41-18 11T2*. The *Middle Member* contained layers of sandstone and silty sandstones with varying amounts of porosity and oil stain (Figure 6). Samples from the *Middle Member* were described as:

> SILTY SANDSTONE: common salt and pepper, occasional light gray to medium gray, visible white, very fine grained, soft to firm, moderately to well sorted, rounded to sub rounded, moderately to poorly cemented, visible calcareous fluid fractures, possible fracture porosity, common intergranular porosity, visible light brown spotty oil stain

*Figure 6: Photograph of sandstone and silty sandstone from the middle member of the **Bakken** formation.*

Lateral

Overview

Drilling fluid consisting of open system salt water brine (9.6-9.7 ppg) was used while drilling the lateral section up to the TD of 20,475'. Four 6" PDC bits were used to drill the lateral.

Bit #5 (Varel VM613P2) was a PDC bit used to drill the start of the lateral from 11,175' to 13,813' and averaged an ROP of 57.30 over 46 hours of use. Bit #6 (Reed) was a PDC bit used to drill from 13,813' to 16,761'; it was used for 69 hours at an average drilling rate of 42.70 feet per hour. Bit #7 (Smith MDSi613) was a PDC bit used to drill from 16,761' to 19,731', and was used for 91 hours and averaged an ROP of 42.70 ft/hr. Bit #8 (Smith MDSi613) was a PDC bit used to drill from 19,731' to TD @ 20,475'

The Upper Bakken Shale was encountered at the measured depth 15,220'. The decision was made to move the bit back to 15,070' MD and sidetrack. Time drilling began using the 5-5 4-4 3-3 2-2 1-1 method and once that was concluded at 15,102' MD the sidetrack was drilled to forward.

The Lower Bakken Shale was encountered at the measured depth 18,550'. The decision was made to move the bit back to 18,000' MD and sidetrack. Time drilling began using the 5-5 4-4 3-3 2-2 1-1 method and once that was concluded at 18,021' MD the sidetrack was drilled to TD.

Drilling operations were concluded at 10:48 on December 31, 2014 at a bottom hole location of 10,630.79' S & 1,109.25' E of surface location or approximately 754.45' FSL & 283.76' FEL of SE SE Sec. 22 T153N, R100W.

Lithology

The target Zone of the **Middle Bakken** consisted of a zone 9 to 19 feet below the **Upper Bakken Shale**. This zone consists of a silty sandstone with very intergranular porosity, moderate gas, and visible oil stain (Figure 6). Samples from the target Zone were generally described as:

> SILTY SANDSTONE: light to medium gray, common light brown to tan, common white to off white, very fine grained, friable to firm, moderately to well sorted, sub rounded to sub angular, moderately to poorly cemented, visible calcareous fluid fractures, trace disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

Gas and hydrocarbon Shows

It was found that the gas and hydrocarbon shows were elevated through the entire lateral with an average background gas of ~3500 units and common peaks of between 7000u and 8000u.

The NOV gas chromatograph showed components of all C1-C4 present through the entire lateral. Sample cuttings throughout the lateral showed oil stain and a fast white diffuse cut when submerged in Acetone solution and observed with a UV fluoroscope. Trace oil was observed in the sample wash water.

Summary

1) The *Kline Federal 5300 41-18 10B* was initially spud for surface drilling on September 9th 2014 in the Indian Hill field of McKenzie County, North Dakota. The well was spud by Nabors 486 and the vertical hole was drilled to a total depth (KOP) of 10,240'.

2) A mud program consisted of diesel invert (9.8-9.9 ppg) after surface casing through the curve build sections. The drilling mud was successful in maintaining stable hole conditions and minimizing washout through the salt intervals. Brine water with a weight of 9.6-9.7 ppg was used during lateral drilling operations to maintain hydrostatic balance until a TD of 20,475'.

3) Two 8 ¾" Varel PDC bit was used to drill out of surface casing to a KOP of 10,240'. Two 8 ¾" PDC bits were used to drill the curve to 11,175' MD. Four 6" PDC bits were used to drill the lateral to 20,475' TD.

4) The lateral was targeting the **Middle Member** of the **Bakken Formation** member ranging from about 9' and 19' below the base of the **Upper Bakken Shale**

5) Gas levels between 3000 and 4000 units were maintained with peaks over 8000 units through the lateral drilling operations while in the **Middle Member**.

6) The **Middle Member** of the **Bakken Formation** target consisted of one observed gross lithology. The **Middle Member** was observed to be a silty sandstone with lots of disseminated pyrite and apparent intergranular porosity with visible oil stain.

7) Trace to moderate oil stain was observed in zone associated with a fast, white, diffuse cut. Trace oil washed out of the samples into the wash water when they were cleaned.

8) Drilling operations were concluded at 14:00 on July 8th, 2014 at a bottom hole location of 254.45' south & 9968.39' east of surface location or approximately 754.45' FSL & 283.76' FEL of SE SE Sec. 22, T153N-R100W.

9) Oasis Petroleum's *Kline Federal 5300 41-18 10B* awaits completion operations to determine its ultimate production potential.

Respectfully submitted,
Annika Tostengard
RPM Geologic LLC

Well Information

Operator:	*Oasis Petroleum North America*	**API #:**	*33-053-06026*
Address:	*1001 Fannin Suite 202* *Houston, TX 77002*	**NDIC Well File #:**	*28652*
		Surface Location:	*SW SW Sec. 18 T153N, R100W*
Well Name:	***Kline Federal 5300 41-18 10B***	**Footages:**	*500' FSL & 237' FWL*
Field/ Prospect:	*Baker*	**County, State:**	*McKenzie Co., ND*
Elevation:	*GL: 2,057'* *KB: 2,082'*	**Basin:**	*Williston*
Spud Date:	*9-Sep-14*	**Well Type:**	*Horizontal Bakken*

Contractor:	*Nabors 486*	**Chemical Company**	*Halliburton*
Toolpushers:	*Logan Penhollow, Tyler Schultz*	**Mud Engineer**	*Tim Vaira*
Field Supervisors:	*Mark Lawlar/Travis Handran*	**H_2S MONITORING:**	*NOV WellSight Gas Watch*
Directional Drilling	*RPM Consulting* *Mark Lawlar/Travis Handran* *Eric Nielssen*	**MWD**	*Gyro Data* *Robert Porter, Kasey (curve)*

Wellsite Geologist	*Annika Tostengard* *Timber Solberg*	**Rock Sampling:**	*30' from 8,350' to 10,860' MD* *50' 11,175' MD to 20,475 (TD)*
Prospect Geologist	*Brendan Hargrove*	**Gas Detector**	*NOV WellSight Gas Watch*
Sample Examination:	Binocular microscope & fluoroscope	**Sample Cuts:**	*Acetone*
Horizontal Target	*Middle Bakken*		

Key Offset Wells:

Oasis Petroleum.	***Kline Federal 5300 41-18 11T2***	*SW SW Sec. 18 T153N, R100W*	*McKenzie Co., ND*
Oasis Petroleum	***Kline Federal 5300 41-18 12TX***	*SW SW Sec. 18 T153N, R100W*	*McKenzie Co., ND*

Pumps:	#1 & #2: HHF 1600 Triplex - 12" Stroke length Output: 0.0997 bbl/stk
Mud Type:	*Diesel invert mud 2,140'-11,125' (Curve TD)* *Salt Water Brine, 10,860' - 20,475' (TD)*
Casing:	*Surface: 13 3/8" 54# J-55 @ 2,083'* *Intermediate: 9 5/8" 40# HCL80 @ 6,125', 7" 32# P-110 @ 11,037'*
Hole Size:	*17 1/2 to 2,125', 12 1/4" to 6,140' MD, 8 3/4" to 11,125' MD 6" to 20,475'(TD)*
Total Drilling Days:	*21*

Horizontal Target:	*Middle Bakken*	**BOTTOM HOLE LOCATION:**
Kick-Off Point / Date:	*10,240' on 15 Nov, 2014*	*254.45' S & 9968.39' E of surface location or approx. or 754.45' FSL & 283.76' FEL*
Total Depth/ Date:	*20,475' 31 Dec, 2014*	*SE SE Sec. 22, T153N, R100W*
Ending Vertical Section	*9968.4*	
Ending Azimuth	*90.81*	
Status of Well:	*Complete*	

Project: Indian Hills
Site: 153N-100W-17/18
Well: Kline Federal 5300 41-18 10B
Wellbore: Kline Federal 5300 41-18 10B
Design: Design #1

OASIS PETROLEUM

WELL DETAILS: Kline Federal 5300 41-18 10B

Ground Level: 2057.0

Northing	Easting	Latitude	Longitude
405202.44	1209970.87	48° 4' 8.200 N	103° 36' 11.950 W

CASING DETAILS

TVD	MD	Name	Size
10765.0	11037.0	7"	7

Azimuths to True North
Magnetic North: 8.27°

Magnetic Field
Strength: 56438.3snT
Dip Angle: 72.99°
Date: 5/19/2014
Model: IGRF2010

SECTION DETAILS

MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	Target
0.0	0.00	0.00	0.0	0.0	0.0	0.00	
2200.0	0.00	0.00	2200.0	0.0	0.0	0.00	
2216.7	0.50	74.25	2216.7	0.0	0.1	3.00	
7926.7	0.50	74.25	7926.4	13.5	48.0	0.00	
7943.3	0.00	0.00	7943.1	13.6	48.1	3.00	
10287.8	0.00	0.00	10287.6	13.6	48.1	0.00	
11037.0	89.90	74.25	10765.0	142.9	506.8	12.00	
11824.6	89.90	90.00	10766.4	250.5	1284.6	2.00	
20590.0	89.90	90.00	10781.7	250.0	10050.0	0.00	5300 41-18 10B PBHL

Daily Activity

Day	Date 2014	Depth 0600 Hrs	24 Hr Footage	Bit #	WOB (Klbs) Rotate	WOB (Klbs) Slide	RPM (RT)	Pump Pressure	SPM 1	SPM 2	GPM	24 Hr Activity	Formation
1	9-Sep	569'	489'	1	5	10	40	0	0	0	0	circulate and condition, rig up cementers, primary cementing, circulate and condition, primary cementing second stage, rig down, install wellheads, pressure test, nipple down bops, rig released at 2200 hours, rig down, skid rig, rig up	Surface
2	10-Sep	2,125'	1,556'	1	5	12	60	0	0	0	0	Drill 596'-1,865' TOOH for MWD, change out BHA, TIH, drill f/ 1,865 - 2,125, TOOH, rig up casers	Piere
3	11-Sep	2,125'	0'	1	0	0	0	0	0	0	0	run casing, rig up cementers, pump cement, rig down cementers, weld on wellhead	Dakota
4	7-Nov	2,125'	0'	2	0	0	0	0	0	0	0	nipple up BOP, TIH, drill cement	Opeche
5	9-Nov	5,832'	3,707'	2	5	15	65	2100	75	75	520	drill 2,125'-5,832'	Tyler
6	10-Nov	6,140'	308'	2	5	15	47	2900	75	75	520	Drill f/ 5,832'-6,140', TOOH, rig up casers, run casing, rig up cement, pump cement, pressure test, rig down	Tyler
7	11-Nov	7,630'	1,490'	3	38	0	68	3200	73	73	611	P/U BHA, trip in hole, drill shoe, drill f/ 6140-7630	Charles
8	12-Nov	8,950'	1,320'	3	25	35	55	2750	150		520	Drill f/7,630' - 8,950'	Lodgepole

Daily Activity

Day	Date 2014	Depth 0600 Hrs	24 Hr Footage	Bit #	WOB (Klbs) Rotate	WOB (Klbs) Slide	RPM (RT)	Pump Pressure	SPM 1	SPM 2	GPM	24 Hr Activity	Formation
9	13-Nov	9,859'	909'	3	10	40	50	3300	150		525	Drill f/ 8,950'-9,859'	Lodgepole
10	14-Nov	10,240'	381'	3,4	10	45	50	2800	150		527	Drill f/ 9,859-9,950, TOOH, inspect BHA, P/U new BHA, TIH, ream salts, TIH, drill 9,950'-10,240, TOH	Lodgepole
11	15-Nov	10,561'	321'	4,5	10	40	50	2800	150		527	TOOH, run logs, P/U curve assembly, TIH, Drill f/ 10,240'-10,583'	Middle Bakken
12	16-Nov	10,859'	298'	5,6	10	35	25	3400		150	510	drill f/ 10,583-10,859, TOOH wet, inspect and changeout BHA	Middle Bakken
13	17-Nov	11,082'	223'	6	10	25	25	1450	98	145	0	TIH, ream salts, TIH, drill f/ 10,859-11,082'	Middle Bakken
14	18-Nov	11,175'	93'	6	10	25	26	2577	140	0	492	Drill f/ 11,082-11,175, TOOH, slip n cut, L/D BHA, rig up casers, run 7" intermediate casing	Middle Bakken
15	19-Nov	11,175'	0'									Run 7" intermediate Casing	Middle Bakken
16	20-Nov	11,175'	0'	6								rig down casing crew, rig up cementers, pump cement, set casing slips, prepare to skid rig	Middle Bakken
17	18-Dec	11,175'	0'									skid rig back, NU BOP, pressure test	Bkken

Daily Activity

Day	Date 2014	Depth 0600 Hrs	24 Hr Footage	Bit #	WOB (Klbs) Rotate	WOB (Klbs) Slide	RPM (RT)	Pump Pressure	SPM 1	SPM 2	GPM	24 Hr Activity	Formation
18	19-Dec	11,493'	318'	7	5	15	45	2100	75	75	263	P/U BHA, TIH, drill f/ 11,175' to 11,493'	Middle Bakken
19	20-Dec	12,866'	1,373'	7	10	18	45	860	30	40	245	drill f/ 11,493- 12,866'	Middle Bakken
20	21-Dec	13,813'	947'	7,8	12	25	45	3158	75	0	263	Drill f/ 12.866'-13,813, TOOH for motor, C/O BHA, TIH	Middle Bakken
21	22-Dec	15,008'	1,195'	8	8	20	40	3200	75	0	263	TIH, drill f/ 13,813'-15,008'	Middle Bakken
22	23-Dec	15,303'	295'	8	15	18	45	2835	75	0	281	Drill f/ 15,008-15303, confirm shale strike, back up 15,024, time drill	Middle Bakken
23	24-Dec	15,984'	681'	8	20	25	30	3736	0	75	263	time drill, , drill f/ 15,098'-15,984'	Middle Bakken
24	25-Dec	16,761'	777'	8	15	22	30	3100	0	75	264	Drill 15,984' - 16,761', TOOH for motor	Middle Bakken
25	26-Dec	16,865'	104'	8,9	12	20	40	3100	0	75	264	TOOH, C/O BHA, TIH, drill f/ 16,761' - 16,865	Middle Bakken
26	27-Dec	18,500'	1,635'	9	12	20	45	3200	0	75	263	Drill f/16,865 - 18,500'	Middle Bakken
27	28-Dec	18,009'	-491'	9	15	101	45	3200	0	75	263	Drill f/ 18,500-18,627, circ Bottoms up, TOH to sidetrack Time drill from 17,936 - 18,010	Middle Bakken
28	29-Dec	18,877'	868'	9	12	20	40	3200	0	75	281	Time Drill 18,010 -18,021'. Drill f/ 18,021-18,877'	Middle Bakken
29	30-Dec	19,731'	854'	10	12	20	40	3200	0	75	281	Drill f 18,877'-19,731' TOOH	Middle Bakken
30	31-Dec	19,731'	0'	10	-	-	-	-	-	-		TOOH, L/D BHA, P/U new BHA TIH, orintate to slide	Middle Bakken
31	1-Jan	20,475'	744'	-	-	-	-	-	-	-		Drill 19,731'-20,475' TOOH, ream, prepare for completions	Middle Bakken

RPM Geologic

Daily Progress

Oasis Petroleum
Kline Federal 5300 41-18 10B

Bit Record

Bit #	Size	Make	Model	Serial #	Jets	Depth In	Depth Out	Footage	Hours	Mean ROP (ft/hr)	Accum. Hours
1	17 1/2	Nov	TFR6195	E163630	12x18	0'	2,125'	2,125'	21	101.20	21.0
2	12 1/4	Varel	Varel	4007781	6x20	2,125'	6,140'	4,000'	26	153.80	47.00
3	8 3/4	Varel	Varel	4006758	6x16	6,140'	9,950'	3810	61.5	62.00	108.5
4	8 3/4	Varel	Varel	4006379	6x16	9,950'	10,240'	290	4.5	64.40	113.0
5	8 3/4	Halliburton	Sec	12560298	5x18	10,240'	10,859'	619	17.5	35.40	130.5
6	8 3/4	Halliburton	Sec	12487646	5x18	10,859'	11,175'	316	10.5	30.10	141.0
7	6	Varel	Varel	4007155	6x18	11,175'	13,813'	2638	46	57.30	187.0
8	6	Reed	Reed	A208139	6x19	13,813'	16,761'	2948	69	42.70	256.0
9	6	Smith	MDSi613	JK0375	6X18	16,761'	19,731'	3461	91	42.70	347.0
10	6	Smith	MDSi613	JJ035	6x18	19,731'	20,475'	744	16	46.50	363.0

DRILLING PLAN

OPERATOR	Oasis Petroleum	**COUNTY/STATE**	McKenzie Co., ND
WELL NAME	Kline Federal 5300 41-18 10B	**RIG**	0
WELL TYPE	Horizontal Middle Bakken		
LOCATION	SWNW 18-153N-100W Surface Location (survey plat): 500' fsl	237' fwl	
EST. T.D.	20,590'	**GROUND ELEV:**	2057 Finished Pad Elev. **Sub Height:** 25
	TOTAL LATERA 9,553'	**KB ELEV:**	2082

PROGNOSIS: Based on 2,082' KB(est)

MARKER		DEPTH (Surf Loc)	DATUM (Surf Loc)
Pierre	NDIC MAP	1,972	110
Greenhorn		4,646	(2,564)
Mowry		5,057	(2,975)
Dakota		5,471	(3,389)
Rierdon		6,486	(4,404)
Dunham Salt		6,814	(4,732)
Dunham Salt Base		6,929	(4,847)
Spearfish		7,024	(4,942)
Pine Salt		7,283	(5,201)
Pine Salt Base		7,318	(5,236)
Opeche Salt		7,374	(5,292)
Opeche Salt Base		7,403	(5,321)
Broom Creek (Top of Minnelusa Gp.)		7,605	(5,523)
Amsden		7,684	(5,602)
Tyler		7,853	(5,771)
Otter (Base of Minnelusa Gp.)		8,047	(5,965)
Kibbey Lime		8,390	(6,308)
Charles Salt		8,542	(6,460)
UB		9,159	(7,077)
Base Last Salt		9,238	(7,156)
Ratcliffe		9,301	(7,219)
Mission Canyon		9,454	(7,372)
Lodgepole		10,022	(7,940)
Lodgepole Fracture Zone		10,209	(8,127)
False Bakken		10,726	(8,644)
Upper Bakken		10,735	(8,653)
Middle Bakken		10,751	(8,669)
Middle Bakken Sand Target		10,760	(8,678)
Base Middle Bakken Sand Target		10,770	(8,688)
Lower Bakken		10,785	(8,703)
Three Forks		10,813	(8,731)

Dip Rate: -0.1

LOGS:

	Type	Interval
OH Logs:	Triple Combo KOP to Kibby (or min run of 1800' whichever is greater); GR/Res to BSC; GR to surf; CND through the Dakota	
CBL/GR:	Above top of cement/GR to base of casing	
MWD GR:	KOP to lateral TD	

DEVIATION:

Surf:	3 deg. max., 1 deg / 100'; srvy every 500'
Prod:	5 deg. max., 1 deg / 100'; srvy every 100'

DST'S: None planned

CORES: None planned

MUDLOGGING:

Two-Man:	8,342'	~200' above the Charles (Kibbey) to Casing point; Casing point to TD

30' samples at direction of wellsite geologist; 10' through target @ curve land

BOP: 11" 5000 psi blind, pipe & annular

Max. Anticipated BHP: 4673 **Surface Formation:** *Glacial till*

MUD:	Interval		Type	WT	Vis	WL	Remarks
Surface:	0' -	2,072'	FW/Gel - Lime Sweeps	8.4-9.0	28-32	NC	Circ Mud Tanks
Intermediate:	2,072' -	11,037'	Invert	9.5-10.4	40-50	30+HtHp	Circ Mud Tanks
Lateral:	11,037' -	20,590'	Salt Water	9.8-10.2	28-32	NC	Circ Mud Tanks

CASING:	Size	Wt ppf	Hole	Depth		Cement	WOC	Remarks
Surface:	9-5/8"	36#	13-1/2"	2,072'		To Surface	12	100' into Pierre
Intermediate:	7"	29/32#	8-3/4"	11,037'		3971	24	1500' above Dakota
Production Liner:	4.5"	11.6#	6"	20,590'	TOL @ 10,238'			50' above KOP

PROBABLE PLUGS, IF REQ'D:

OTHER:

	MD	TVD	FNL/FSL	FEL/FWL	S-T-R	AZI
Surface:	2,072	2,072	500' FSL	237' FWL	SEC 18-T153N-R100W	Survey Company:
KOP:	10,288'	10,288'	514' FSL	285' FWL	SEC 18-T153N-R100W	Build Rate: 12 deg /100'
EOC:	11,037'	10,765'	643' FSL	744' FWL	SEC 18-T153N-R100W	
Casing Point:	11,037'	10,765'	643' FSL	744' FWL	SEC 18-T153N-R100W	
Middle Bakken Lateral TD:	20,590'	10,782'	750' FSL	200' FEL	SEC 17-T153N-R100W	

Comments:

Request a Sundry for an Open Hole Log Waiver

Exception well: Oasis Petroleum's Kline Federal 5300 11-18H (153N 100W 18 NW NW)

35 packers, 35 sleeves, no frac string

Oasis Petroleum does not use Diesel Fuel, as defined by the US EPA in the list below, in our hydraulic fracture operations.

68334-30-5 (Primary Name: Fuels, diesel) 68476-34-6 (Primary Name: Fuels, diesel, No. 2)68476-30-2 (Primary Name: Fuel oil No. 2)

68476-31-3 (Primary Name: Fuel oil, No. 4)8008-20-6 (Primary Name: Kerosene)

Geology: M. Steed 4/3/2014 **Engineering:** hbader rpm

Formation Tops

	Subject Well:						
Operator:	**Oasis Petroleum North America**						
Well Name:	***Kline Federal 5300 41-18 10B***						
Location:	533' FSL &237' FWL SW SW Sec. 18 T153N, R100W						
Elevation:	GL: 2,057' Sub: 25' KB: 2,082'						
Formation/ Zone	**Prog. Top**	**Prog. MSL Datum**	**Est. MD Top (Gamma)**	**TVD Top (Gamma)**	**Est. MLS Datum**	**Thickness**	**Dip To *Kline Federal 5300 41-18 11T2***
Kibbey Lime	8,380	-6,298'	8,376'	8,376'	-6,294'	190'	6' High
Charles Salt	8,560	-6,478'	8,566'	8,566'	-6,484'	640'	1' Low
Base Last Salt	9,207	-7,125'	9,206'	9,206'	-7,124'	222'	1' High
Mission Canyon	9,429	-7,347'	9,428'	9,428'	-7,346'	552'	2' High
Lodgepole	9,975	-7,893'	9,980'	9,980'	-7,898'	728'	3' Low
False Bakken	10,707	-8,625'	10,864'	10,708'	-8,626'	8'	4' High
Upper Bakken Shale	10,717	-8,635'	10,890'	10,716'	-8,634'	17'	3' High
Middle Bakken	10,734	-8,652'	10,954'	10,733'	-8,651'	-	2' High

Control Well

Operator:	**Oasis Petroleum**				**Oasis Petroleum**			
Well Name:	***Kline Federal 5300 41-18 11T2***				***Kline Federal 5300 41-18 12TX***			
Location:	SW SW Sec. 18 T153N, R100W McKenzie Co., ND Approximately 25 ft South				SW SW Sec. 18 T153N, R100W McKenzie Co., ND Approximately 50 feet South			
Elevation:	KB: 2,082'				KB: 2,082'			
Formation/ Zone	**Est. TVD**	**MSL Datum**	**Thickness**	**Dist to target**	**Est. TVD**	**MSL Datum**	**Thickness**	**Dist to target**
Kibbey Lime	8,382'	-6,300'	183'	2,368'	8,384	-6,302'	172'	2,361'
Charles Salt	8,565'	-6,483'	642'	2,185'	8,556	-6,474'	650'	2,189'
Base Last Salt	9,207'	-7,125'	223'	1,543'	9,206	-7,124'	222'	1,539'
Mission Canyon	9,430'	-7,348'	567'	1,320'	9,428	-7,346'	547'	1,317'
Lodgepole	9,997'	-7,915'	708'	753'	9,975	-7,893'	729'	770'
False Bakken	10,705'	-8,623'	7'	45'	10,704	-8,622'	9'	41'
Upper Bakken Shale	10,712'	-8,630'	18'	38'	10,713	-8,631'	17'	32'
Middle Bakken	10,730'	-8,648'	20'	20'	10,730	-8,648'	27'	15'
Target	10,750'	-8,668'		'	10,745'	-8,663'		'

Offset Well Target Isopachs
Distance to Target
2,500'
2,000'
1,500'
1,000'
500'
-
2,368'
2,361'
2,374'
2,185'
2,189'
2,184'
1,543'
1,539'
1,544'
1,320'
1,317'
1,322'
753'
770'
770'
45'
41'
42'
38'
32'
34'
20'
15'
17'
Kibbey Lime
Charles Salt
Base Last Salt
Mission Canyon
Lodgepole
False Bakken
Upper Bakken Shale
Middle Bakken
Kline Federal 5300 41-18 11T2
Kline Federal 5300 41-18 12TX
Kline Federal 5300 41-18 10B

RPM Geologic

Surface: 500' FSL & 237' FEL
SW SW Sec. 18 T153N, R100W
McKenzie County, ND

Kline 5300 41-18 10B
Cross Section

Bottom Hole Location:
254.45' S & 9968.39' E
of surface location or approx.
754.45' FSL & 283.76' FEL
SE SE Sec. 17 T153N, R100W

Well Bore | Base UBS | Top of Target | Bottom of Target | Top LBS | Sidetrack 1 | Sidetrack 2 | 2 per. Mov. Avg. (TG x.2) | 2 per. Mov. Avg. (ROP x 50) | 2 per. Mov. Avg. (GR x 30)

RPM Geologic

Surface: 500' FSL & 237' FEL
SW SW Sec. 18 T153N, R100W
McKenzie County, ND

Kline Federal 5300 41-18 10B
Gamma Cross Section

Bottom Hole Location:
254.45' S & 9968.39' E
of surface location or approx.
754.45' FSL & 283.76' FEL
SE SE Sec. 17 T153N, R100W

RPM Geologic

Vertical Section View

Surface Location:
500' FSL & 237' FWL
SW SW Sec. 18, T153N, R100W
McKenzie County, ND

Bottom Hole Location
254.45' S & 9968.39' E
of surface location or approx.
754.45' FSL & 283.76' FEL
SE SE Sec. 17 T153N, R100W

WELL LOCATION PLAT

OASIS PETROLEUM NORTH AMERICA, LLC
1001 FANNIN, SUITE 1500, HOUSTON, TX 77002
"KLINE FEDERAL 5300 41-18 10B"
500 FEET FROM SOUTH LINE AND 237 FEET FROM WEST LINE
SECTION 18, T153N, R100W, 5th P.M., MCKENZIE COUNTY, NORTH DAKOTA

VICINITY MAP

THIS DOCUMENT WAS ORIGINALLY ISSUED AND SEALED BY ROBERT L. PROCIVE, PLS, REGISTRATION NUMBER 2884 ON 4/15/14 AND THE ORIGINAL DOCUMENTS ARE STORED AT THE OFFICES OF INTERSTATE ENGINEERING, INC.

0 1000
1" = 1000'

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– MONUMENT – NOT RECOVERED

STAKED ON 4/15/14
VERTICAL CONTROL DATUM WAS BASED UPON CONTROL POINT 4 WITH AN ELEVATION OF 2090.8'

THIS SURVEY AND PLAT IS BEING PROVIDED AT THE REQUEST OF ERIC BAYES OF OASIS PETROLEUM. I CERTIFY THAT THIS PLAT CORRECTLY REPRESENTS WORK PERFORMED BY ME OR UNDER MY SUPERVISION AND IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF.

ROBERT L. PROCIVE 2884LS

REGISTERED LAND SURVEYOR
ROBERT L. PROCIVE
LS-2884
DATE: 4/15/14
NORTH DAKOTA

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Revision No.	Date	By	Description

OASIS PETROLEUM NORTH AMERICA, LLC
WELL LOCATION PLAT
SECTION 18, T153N, R100W
MCKENZIE COUNTY, NORTH DAKOTA

Drawn By: B.H.H. Project No.: S14-09-081.04
Checked By: R.L.P. Date: APRIL 2014

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SECTION BREAKDOWN

OASIS PETROLEUM NORTH AMERICA, LLC
1001 FANNIN, SUITE 1500, HOUSTON, TX 77002
"KLINE FEDERAL 5300 41-18 10B"
500 FEET FROM SOUTH LINE AND 237 FEET FROM WEST LINE
SECTIONS 17 & 18, T153N, R100W, 5th P.M., MCKENZIE COUNTY, NORTH DAKOTA

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ALL AZIMUTHS ARE BASED ON G.P.S. OBSERVATIONS. THE ORIGINAL SURVEY OF THIS AREA FOR THE GENERAL LAND OFFICE (G.L.O.) WAS 1891. THE CORNERS FOUND ARE AS INDICATED AND ALL OTHERS ARE COMPUTED FROM THOSE CORNERS FOUND AND BASED ON G.L.O. DATA. THE MAPPING ANGLE FOR THIS AREA IS APPROXIMATELY 0°03'.

VICINITY MAP

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Revision No.	Date	By	Description

OASIS PETROLEUM NORTH AMERICA, LLC
SECTION BREAKDOWN
SECTIONS 17 & 18, T153N, R100W
MCKENZIE COUNTY, NORTH DAKOTA

Drawn By: B.H.H. Project No.: S14-09-081.04
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PAD LAYOUT

OASIS PETROLEUM NORTH AMERICA, LLC
1001 FANNIN, SUITE 1500, HOUSTON, TX 77002
"KLINE FEDERAL 5300 41-18 10B"
500 FEET FROM SOUTH LINE AND 237 FEET FROM WEST LINE
SECTION 18, T153N, R100W, 5th P.M., MCKENZIE COUNTY, NORTH DAKOTA

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NOTE: Pad dimensions shown are to usable area, the v-ditch and berm areas shall be built to the outside of the pad dimensions.

REGISTERED LAND SURVEYOR
ROBERT L. PROCIVE
LS-2884
DATE: 4/15/14
NORTH DAKOTA

V-DITCH DETAIL

Proposed Contours
Original Contours
BERM
DITCH

NOTE: All utilities shown are preliminary only, a complete utilities location is recommended before construction.

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0 80
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OASIS PETROLEUM NORTH AMERICA, LLC
PAD LAYOUT
SECTION 18, T153N, R100W
MCKENZIE COUNTY, NORTH DAKOTA

Drawn By: B.H.H. | Project No.: S14-09-081.04
Checked By: D.D.K. | Date: APRIL 2014

Revision No.	Date	By	Description

G:\2014\09-081\09-081.04 - Oasis Petroleum - Kline Federal 5300 41-18 10B
Location\Cad\Kline Federal 5300 41-18 10B.dwg - 4/15/2014 3:52 PM jack schmierer

PAD LAYOUT

OASIS PETROLEUM NORTH AMERICA, LLC
1001 FANNIN, SUITE 1500, HOUSTON, TX 77002
"KLINE FEDERAL 5300 41-18 9T"
533 FEET FROM SOUTH LINE AND 237 FEET FROM WEST LINE
SECTION 18, T153N, R100W, 5th P.M., MCKENZIE COUNTY, NORTH DAKOTA

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REGISTERED LAND SURVEYOR
ROBERT L. PROCIVE
REG. NO. LS-2884
DATE: 4/15/14
NORTH DAKOTA

V-DITCH DETAIL

Proposed Contours
Original Contours
BERM
DITCH

NOTE: All utilities shown are preliminary only, a complete utilities location is recommended before construction.

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0 80
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PAD LAYOUT
SECTION 18, T153N, R100W
MCKENZIE COUNTY, NORTH DAKOTA

Drawn By: B.H.H.	Project No.: S14-09-081.05
Checked By: D.D.K.	Date: APRIL 2014

Revision No.	Date	By	Description

Q:\2014\S14-09-081.05 Oasis Petroleum - Kline Federal 5300 41-18 9T Location\CAD\Kline Federal 5300 41-18 9T.dwg - 4/15/2014 3:59 PM josh schmierer

ACCESS APPROACH

OASIS PETROLEUM NORTH AMERICA, LLC
1001 FANNIN, SUITE 1500, HOUSTON, TX 77002
"KLINE FEDERAL 5300 41-18 10B"
500 FEET FROM SOUTH LINE AND 237 FEET FROM WEST LINE
SECTION 18, T153N, R100W, 5th P.M., MCKENZIE COUNTY, NORTH DAKOTA

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REGISTERED LAND SURVEYOR
ROBERT L. PROCIVE
LS-2884
DATE: 4/15/14
NORTH DAKOTA

0 500
1" = 500'

NOTE: All utilities shown are preliminary only, a complete utilities location is recommended before construction.

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OASIS PETROLEUM NORTH AMERICA, LLC
ACCESS APPROACH
SECTION 18, T153N, R100W
MCKENZIE COUNTY, NORTH DAKOTA

Drawn By: B.H.H.	Project No.: S14-09-081.04
Checked By: R.L.P.	Date: APRIL 2014

Revision No.	Date	By	Description

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OASIS PETROLEUM NORTH AMERICA, LLC
QUAD LOCATION MAP
SECTION 18, T153N, R100W
MCKENZIE COUNTY, NORTH DAKOTA

Drawn By: B.H.H. | Project No.: S14-09-081.04
Checked By: R.L.P. | Date: APRIL 2014

Revision No.	Date	By	Description

COUNTY ROAD MAP

OASIS PETROLEUM NORTH AMERICA, LLC
1001 FANNIN, SUITE 1500, HOUSTON, TX 77002
"KLINE FEDERAL 5300 41-18 10B"
500 FEET FROM SOUTH LINE AND 237 FEET FROM WEST LINE
SECTION 18, T153N, R100W, 5th P.M., MCKENZIE COUNTY, NORTH DAKOTA

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SCALE: 1" = 2 MILE

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OASIS PETROLEUM NORTH AMERICA, LLC
COUNTY ROAD MAP
SECTION 18, T153N, R100W
MCKENZIE COUNTY, NORTH DAKOTA

Drawn By: B.H.H.	Project No.: S14-09-081.04		
Checked By: R.L.P.	Date: APRIL 2014		

Revision No.	Date	By	Description

RPM Geologic

Operator:	Oasis Petroleum
Well :	Kline Federal 5300 41-18 10B
MWD Providers	GyroData
Directional Supervision:	RPM

Section:	18	QQ:	SW SW	County:	McKenzie	State:	ND
Township:	153	N/S:	N	Footages:	500	FN/SL:	S
Range:	100	E/W:	W		237	FE/WL:	W

Vertical Section Plane: 90

#	MD	Inc.	Azm.	T.V.D.	Ver. Sect.	Coordinates +N / -S	+E / -W	DLS
Tie	10187.00	0.66	66.22	10186.59	43.31	15.00	43.31	0.22
1	10217.00	0.44	40.99	10216.59	43.54	15.16	43.54	1.07
2	10248.00	2.68	70.70	10247.58	44.31	15.49	44.31	7.45
3	10279.00	7.78	74.22	10278.44	47.01	16.30	47.01	16.48
4	10311.00	13.05	74.83	10309.90	52.59	17.83	52.59	16.47
5	10343.00	18.46	74.57	10340.68	60.96	20.13	60.96	16.91
6	10375.00	20.40	71.84	10370.86	71.15	23.21	71.15	6.69
7	10406.00	22.11	70.88	10399.75	81.79	26.81	81.79	5.63
8	10438.00	24.53	70.79	10429.14	93.76	30.97	93.76	7.56
9	10470.00	25.93	73.60	10458.08	106.74	35.13	106.74	5.76
10	10502.00	30.11	78.00	10486.33	121.31	38.78	121.31	14.56
11	10533.00	33.54	79.67	10512.66	137.35	41.93	137.35	11.42
12	10565.00	37.14	79.40	10538.76	155.55	45.29	155.55	11.26
13	10597.00	41.14	75.09	10563.58	175.23	49.78	175.23	15.11
14	10628.00	45.36	73.69	10586.16	195.68	55.50	195.68	13.96
15	10660.00	49.85	71.84	10607.73	218.24	62.52	218.24	14.67
16	10691.00	53.49	73.69	10626.95	241.46	69.71	241.46	12.64
17	10723.00	57.10	76.06	10645.17	266.85	76.56	266.85	12.82
18	10754.00	60.40	77.82	10661.25	292.67	82.54	292.67	11.70
19	10785.00	64.04	77.73	10675.70	319.47	88.35	319.47	11.74
20	10816.00	67.91	77.91	10688.32	347.14	94.32	347.14	12.50
21	10848.00	68.31	78.52	10700.25	376.20	100.39	376.20	2.17
22	10879.00	68.35	78.08	10711.69	404.41	106.23	404.41	1.33
23	10910.00	71.74	76.76	10722.27	432.85	112.58	432.85	11.64
24	10942.00	77.23	76.41	10730.83	462.83	119.73	462.83	17.19
25	10973.00	81.05	75.62	10736.67	492.37	127.09	492.37	12.57
26	11005.00	81.49	73.60	10741.53	522.86	135.48	522.86	6.39
27	11036.00	81.54	73.69	10746.10	552.28	144.11	552.28	0.33
28	11068.00	85.01	73.07	10749.85	582.73	153.20	582.73	11.01
29	11078.00	86.42	73.25	10750.59	592.27	156.09	592.27	14.21
30	11098.00	88.09	71.84	10751.55	611.33	162.08	611.33	10.92
31	11166.00	88.70	71.38	10753.46	675.83	183.53	675.83	1.12

32	11197.00	89.05	71.21	10754.06	705.18	193.47	705.18	1.26
33	11229.00	89.71	70.68	10754.41	735.43	203.91	735.43	2.65
34	11260.00	90.59	71.91	10754.33	764.79	213.86	764.79	4.88
35	11291.00	91.30	73.84	10753.82	794.41	222.98	794.41	6.63
36	11322.00	91.96	75.07	10752.94	824.26	231.29	824.26	4.50
37	11353.00	92.70	76.39	10751.68	854.28	238.92	854.28	4.88
38	11384.00	92.88	78.50	10750.17	884.50	245.65	884.50	6.82
39	11415.00	92.88	79.38	10748.61	914.89	251.59	914.89	2.84
40	11446.00	92.35	80.88	10747.20	945.40	256.90	945.40	5.13
41	11477.00	92.09	82.72	10745.99	976.06	261.32	976.06	5.99
42	11508.00	92.18	82.72	10744.84	1006.78	265.24	1006.78	0.29
43	11539.00	91.12	86.06	10743.95	1037.62	268.27	1037.62	11.30
44	11570.00	89.63	86.32	10743.74	1068.55	270.33	1068.55	4.88
45	11602.00	88.53	88.76	10744.26	1100.51	271.70	1100.51	8.36
46	11633.00	89.36	87.03	10744.83	1131.48	272.84	1131.48	6.19
47	11664.00	90.46	88.35	10744.88	1162.46	274.09	1162.46	5.54
48	11695.00	91.08	88.70	10744.46	1193.44	274.89	1193.44	2.30
49	11726.00	91.56	88.79	10743.75	1224.43	275.57	1224.43	1.58
50	11758.00	90.29	90.02	10743.23	1256.42	275.90	1256.42	5.52
51	11820.00	90.02	90.81	10743.06	1318.42	275.45	1318.42	1.35
52	11851.00	90.42	90.28	10742.94	1349.42	275.16	1349.42	2.14
53	11882.00	90.73	90.10	10742.63	1380.42	275.05	1380.42	1.16
54	11913.00	90.77	90.37	10742.23	1411.41	274.93	1411.41	0.88
55	11945.00	89.85	90.72	10742.05	1443.41	274.62	1443.41	3.08
56	12007.00	88.66	91.42	10742.86	1505.39	273.46	1505.39	2.23
57	12069.00	89.05	90.19	10744.10	1567.37	272.59	1567.37	2.08
58	12100.00	89.54	90.02	10744.48	1598.37	272.54	1598.37	1.67
59	12163.00	89.71	87.64	10744.89	1661.35	273.82	1661.35	3.79
60	12194.00	88.70	88.26	10745.32	1692.33	274.93	1692.33	3.82
61	12256.00	89.80	87.03	10746.13	1754.27	277.48	1754.27	2.66
62	12287.00	90.11	89.14	10746.16	1785.25	278.52	1785.25	6.88
63	12349.00	90.20	88.87	10745.99	1847.24	279.59	1847.24	0.46
64	12380.00	89.49	88.26	10746.07	1878.23	280.37	1878.23	3.02
65	12411.00	89.36	89.84	10746.39	1909.22	280.88	1909.22	5.11
66	12473.00	90.07	88.35	10746.69	1971.21	281.86	1971.21	2.66
67	12505.00	90.51	89.31	10746.53	2003.20	282.51	2003.20	3.30
68	12567.00	91.69	89.23	10745.34	2065.19	283.30	2065.19	1.91
69	12599.00	91.08	91.16	10744.57	2097.18	283.20	2097.18	6.32
70	12662.00	90.55	91.95	10743.67	2160.14	281.49	2160.14	1.51
71	12693.00	89.67	93.44	10743.61	2191.11	280.03	2191.11	5.58
72	12756.00	90.64	93.00	10743.44	2254.01	276.49	2254.01	1.69
73	12788.00	89.41	93.71	10743.43	2285.95	274.62	2285.95	4.44
74	12851.00	89.14	93.18	10744.23	2348.83	270.83	2348.83	0.94
75	12883.00	88.62	93.80	10744.85	2380.77	268.88	2380.77	2.53

76	12945.00	89.05	93.62	10746.11	2442.63	264.87	2442.63	0.75
77	13040.00	88.79	92.48	10747.90	2537.47	259.82	2537.47	1.23
78	13103.00	88.97	91.42	10749.13	2600.42	257.68	2600.42	1.71
79	13135.00	89.41	91.25	10749.59	2632.41	256.93	2632.41	1.47
80	13229.00	87.56	91.25	10752.07	2726.35	254.88	2726.35	1.97
81	13324.00	87.69	90.63	10756.01	2821.26	253.32	2821.26	0.67
82	13355.00	87.74	90.46	10757.24	2852.23	253.03	2852.23	0.57
83	13387.00	88.00	90.28	10758.43	2884.21	252.82	2884.21	0.99
84	13418.00	88.57	89.31	10759.36	2915.19	252.93	2915.19	3.63
85	13481.00	88.97	89.40	10760.71	2978.17	253.64	2978.17	0.65
86	13512.00	89.41	89.93	10761.15	3009.17	253.82	3009.17	2.22
87	13544.00	90.29	88.87	10761.24	3041.17	254.16	3041.17	4.31
88	13607.00	91.08	88.87	10760.48	3104.15	255.40	3104.15	1.25
89	13670.00	90.02	88.52	10759.88	3167.13	256.84	3167.13	1.77
90	13700.00	90.33	89.14	10759.79	3197.12	257.45	3197.12	2.31
91	13732.00	90.42	88.61	10759.58	3229.12	258.08	3229.12	1.68
92	13763.00	89.71	89.49	10759.54	3260.11	258.59	3260.11	3.65
93	13795.00	89.85	90.46	10759.66	3292.11	258.60	3292.11	3.06
94	13858.00	89.05	91.86	10760.27	3355.09	257.33	3355.09	2.56
95	13890.00	88.75	91.25	10760.88	3387.08	256.46	3387.08	2.12
96	13953.00	88.22	89.49	10762.55	3450.05	256.05	3450.05	2.92
97	13984.00	88.53	88.87	10763.43	3481.03	256.50	3481.03	2.24
98	14047.00	89.76	91.77	10764.37	3544.02	256.15	3544.02	5.00
99	14079.00	89.63	89.93	10764.54	3576.01	255.67	3576.01	5.76
100	14110.00	88.92	88.79	10764.93	3607.01	256.02	3607.01	4.33
101	14173.00	88.66	87.38	10766.26	3669.96	258.12	3669.96	2.28
102	14205.00	88.79	89.75	10766.97	3701.94	258.92	3701.94	7.42
103	14268.00	89.32	88.87	10768.01	3764.92	259.68	3764.92	1.63
104	14299.00	90.24	89.84	10768.13	3795.92	260.03	3795.92	4.31
105	14362.00	90.59	89.93	10767.68	3858.92	260.16	3858.92	0.57
106	14393.00	90.90	92.30	10767.27	3889.91	259.55	3889.91	7.71
107	14457.00	91.08	90.72	10766.17	3953.87	257.87	3953.87	2.48
108	14520.00	90.51	90.90	10765.29	4016.86	256.98	4016.86	0.95
109	14551.00	90.11	89.75	10765.12	4047.86	256.80	4047.86	3.93
110	14614.00	90.77	89.75	10764.64	4110.86	257.08	4110.86	1.05
111	14646.00	91.12	89.93	10764.11	4142.85	257.17	4142.85	1.23
112	14709.00	90.90	89.75	10763.00	4205.84	257.34	4205.84	0.45
113	14740.00	90.90	88.52	10762.52	4236.83	257.81	4236.83	3.97
114	14803.00	90.66	89.40	10761.66	4299.82	258.95	4299.82	1.45
115	14835.00	90.33	87.91	10761.38	4331.81	259.70	4331.81	4.77
116	14866.00	89.85	87.99	10761.33	4362.79	260.81	4362.79	1.57
117	14929.00	89.58	87.12	10761.65	4425.73	263.50	4425.73	1.45
118	14961.00	89.54	89.75	10761.89	4457.71	264.37	4457.71	8.22
119	15024.00	90.07	90.98	10762.11	4520.71	263.97	4520.71	2.13

120	15118.00	90.37	91.77	10761.75	4614.68	261.72	4614.68	0.90
121	15149.00	91.08	92.04	10761.35	4645.66	260.69	4645.66	2.45
122	15181.00	91.52	90.54	10760.63	4677.64	259.97	4677.64	4.88
123	15212.00	91.91	90.98	10759.70	4708.63	259.56	4708.63	1.90
Proj	15300.00	90.00	90.00	10758.23	4796.61	258.80	4796.61	2.44

RPM Geologic

Operator:	**Oasis Petroleum**
Well :	Kline Federal 5300 41-18 10B
MWD Providers	Ryan
Directional Supervision:	RPM

Section:	18	QQ:	SW SW	County:	McKenzie	State:	ND
Township:	153	N/S:	N	Footages:	500	FN/SL:	S
Range:	100	E/W:	W		237	FE/WL:	W

Sidetrack #1 Surveys

Vertical Section Plane: **90**

#	MD	Inc.	Azm.	T.V.D.	Ver. Sect.	Coordinates +N / -S	Coordinates +E / -W	DLS
Tie	**14961.00**	**89.54**	**89.75**	**10761.87**	**4457.76**	**264.58**	**4457.76**	**0.00**
1	15024.00	90.07	90.98	10762.08	4520.76	264.18	4520.76	2.13
2	15087.00	87.56	92.39	10763.39	4583.71	262.33	4583.71	4.57
3	15118.00	87.30	93.09	10764.78	4614.64	260.85	4614.64	2.41
4	15149.00	87.69	92.92	10766.13	4645.57	259.22	4645.57	1.37
5	15181.00	87.47	91.51	10767.48	4677.52	257.99	4677.52	4.46
6	15212.00	87.16	91.77	10768.94	4708.47	257.10	4708.47	1.30
7	15244.00	87.25	92.65	10770.50	4740.41	255.87	4740.41	2.76
8	15275.00	88.75	91.77	10771.58	4771.37	254.67	4771.37	5.61
9	15306.00	89.05	91.25	10772.17	4802.35	253.86	4802.35	1.94
10	15338.00	89.10	92.04	10772.69	4834.33	252.94	4834.33	2.47
11	15369.00	89.67	91.42	10773.02	4865.31	252.00	4865.31	2.72
12	15401.00	90.02	91.25	10773.11	4897.31	251.26	4897.31	1.22
13	15432.00	90.29	92.30	10773.03	4928.29	250.30	4928.29	3.50
14	15495.00	89.71	89.75	10773.03	4991.27	249.17	4991.27	4.15
15	15527.00	88.79	89.84	10773.44	5023.27	249.29	5023.27	2.89
16	15590.00	89.32	89.49	10774.48	5086.26	249.65	5086.26	1.01
17	15621.00	89.67	88.87	10774.76	5117.26	250.10	5117.26	2.30
18	15684.00	89.54	88.61	10775.19	5180.24	251.48	5180.24	0.46
19	15716.00	89.54	87.73	10775.45	5212.22	252.50	5212.22	2.75
20	15779.00	89.67	88.26	10775.88	5275.18	254.71	5275.18	0.87
21	15810.00	87.87	89.75	10776.55	5306.17	255.25	5306.17	7.54
22	15873.00	89.05	90.54	10778.24	5369.14	255.09	5369.14	2.25
23	15905.00	91.03	90.63	10778.22	5401.14	254.76	5401.14	6.19
24	15968.00	92.35	90.46	10776.36	5464.11	254.16	5464.11	2.11
25	16000.00	90.81	89.93	10775.48	5496.10	254.05	5496.10	5.09
26	16063.00	91.65	89.31	10774.13	5559.08	254.47	5559.08	1.66
27	16094.00	90.20	87.12	10773.62	5590.06	255.44	5590.06	8.47
28	16126.00	90.29	88.17	10773.49	5622.03	256.75	5622.03	3.29
29	16157.00	89.32	86.41	10773.59	5652.99	258.22	5652.99	6.48
30	16188.00	88.62	88.17	10774.15	5683.95	259.68	5683.95	6.11
31	16251.00	89.27	88.61	10775.31	5746.92	261.45	5746.92	1.25
32	16346.00	89.58	88.08	10776.26	5841.87	264.19	5841.87	0.65
33	16377.00	89.05	88.70	10776.63	5872.86	265.07	5872.86	2.63

34	16440.00	91.52	88.87	10776.32	5935.84	266.40	5935.84	3.93
35	16472.00	89.85	90.02	10775.94	5967.83	266.71	5967.83	6.34
36	16503.00	90.46	91.25	10775.86	5998.83	266.37	5998.83	4.43
37	16535.00	90.42	90.63	10775.61	6030.82	265.84	6030.82	1.94
38	16598.00	88.44	91.60	10776.24	6093.80	264.62	6093.80	3.50
39	16629.00	86.15	91.33	10777.70	6124.76	263.83	6124.76	7.44
40	16724.00	86.37	91.33	10783.90	6219.53	261.63	6219.53	0.23
41	16787.00	87.21	92.92	10787.42	6282.38	259.29	6282.38	2.85
42	16818.00	88.75	92.04	10788.52	6313.33	257.95	6313.33	5.72
43	16851.00	89.14	91.33	10789.12	6346.31	256.98	6346.31	2.45
44	16914.00	89.71	91.25	10789.76	6409.30	255.56	6409.30	0.91
45	16945.00	89.67	90.54	10789.92	6440.29	255.08	6440.29	2.29
46	17008.00	89.71	89.75	10790.26	6503.29	254.92	6503.29	1.26
47	17103.00	89.54	88.87	10790.89	6598.28	256.06	6598.28	0.94
48	17197.00	90.07	88.52	10791.21	6692.25	258.21	6692.25	0.68
49	17228.00	89.89	88.17	10791.22	6723.24	259.10	6723.24	1.27
50	17291.00	90.64	88.26	10790.93	6786.21	261.06	6786.21	1.20
51	17323.00	90.46	89.93	10790.62	6818.20	261.57	6818.20	5.25
52	17354.00	90.73	90.28	10790.30	6849.20	261.51	6849.20	1.43
53	17386.00	90.95	90.02	10789.83	6881.20	261.43	6881.20	1.06
54	17418.00	91.08	90.10	10789.26	6913.19	261.39	6913.19	0.48
55	17449.00	89.01	90.90	10789.24	6944.19	261.12	6944.19	7.16
56	17480.00	89.14	91.07	10789.74	6975.18	260.59	6975.18	0.69
57	17575.00	89.58	90.10	10790.80	7070.17	259.62	7070.17	1.12
58	17607.00	89.89	89.66	10790.95	7102.17	259.69	7102.17	1.68
59	17669.00	90.90	89.68	10790.52	7164.16	260.04	7164.16	1.63
60	17701.00	90.46	90.37	10790.14	7196.16	260.03	7196.16	2.56
61	17764.00	91.03	89.84	10789.32	7259.16	259.92	7259.16	1.24
62	17796.00	89.19	89.84	10789.26	7291.15	260.00	7291.15	5.75
63	17858.00	89.27	89.40	10790.09	7353.15	260.42	7353.15	0.72
64	17952.00	90.81	89.14	10790.03	7447.14	261.61	7447.14	1.66
65	18046.00	90.46	89.23	10788.98	7541.12	262.95	7541.12	0.38
66	18078.00	90.02	89.66	10788.85	7573.12	263.26	7573.12	1.92
67	18140.00	90.37	89.49	10788.64	7635.12	263.72	7635.12	0.63
68	18172.00	88.18	89.66	10789.04	7667.11	263.96	7667.11	6.86
69	18235.00	88.18	89.49	10791.04	7730.08	264.42	7730.08	0.27
70	18266.00	88.53	89.49	10791.93	7761.06	264.70	7761.06	1.13
71	18329.00	89.36	89.49	10793.09	7824.05	265.26	7824.05	1.32
72	18360.00	88.09	90.19	10793.78	7855.04	265.35	7855.04	4.68
73	18423.00	88.48	89.93	10795.67	7918.01	265.28	7918.01	0.74
74	18454.00	88.97	89.58	10796.36	7949.01	265.41	7949.01	1.94
75	18516.00	89.71	89.49	10797.07	8011.00	265.92	8011.00	1.20
76	18551.00	88.04	90.28	10797.76	8045.99	265.99	8045.99	5.28
77	18629.00	90.00	90.00	10799.10	8123.97	265.80	8123.97	2.54

RPM Geologic

Operator:	**Oasis Petroleum**
Well :	Kline Federal 5300 41-18 10B
MWD Providers	Ryan
Directional Supervision:	RPM

Section:	18	QQ:	SW SW	County:	McKenzie	State:	ND
Township:	153	N/S:	N	Footages:	500	FN/SL:	S
Range:	100	E/W:	W		237	FE/WL:	W

Sidetrack #2 Surveys

Vertical Section Plane: **90**

#	MD	Inc.	Azm.	T.V.D.	Ver. Sect.	Coordinates +N / -S	Coordinates +E / -W	DLS
Tie	**17858.00**	**89.27**	**89.40**	**10790.09**	**7353.09**	**258.85**	**7353.09**	**0.72**
1	17952.00	90.59	89.14	10790.20	7447.08	260.05	7447.08	1.43
2	17984.00	90.81	88.87	10789.81	7479.07	260.60	7479.07	1.09
3	18015.00	89.23	90.10	10789.80	7510.07	260.88	7510.07	6.46
4	18046.00	90.07	90.46	10789.99	7541.07	260.73	7541.07	2.95
5	18109.00	90.42	89.84	10789.72	7604.07	260.57	7604.07	1.13
6	18140.00	90.55	90.37	10789.46	7635.07	260.51	7635.07	1.76
7	18203.00	91.12	90.98	10788.54	7698.05	259.77	7698.05	1.33
8	18235.00	91.65	90.98	10787.77	7730.04	259.22	7730.04	1.66
9	18297.00	92.00	91.16	10785.79	7792.00	258.06	7792.00	0.63
10	18329.00	92.40	90.90	10784.57	7823.97	257.49	7823.97	1.49
11	18360.00	92.57	90.90	10783.22	7854.94	257.00	7854.94	0.55
12	18423.00	91.78	90.98	10780.83	7917.88	255.97	7917.88	1.26
13	18454.00	92.00	90.72	10779.81	7948.86	255.51	7948.86	1.10
14	18517.00	92.84	90.63	10777.15	8011.80	254.77	8011.80	1.34
15	18548.00	91.30	91.16	10776.03	8042.78	254.28	8042.78	5.25
16	18611.00	90.81	91.60	10774.87	8105.75	252.77	8105.75	1.05
17	18705.00	89.98	91.69	10774.22	8199.70	250.07	8199.70	0.89
18	18768.00	90.90	91.07	10773.74	8262.68	248.55	8262.68	1.76
19	18799.00	91.25	90.90	10773.16	8293.67	248.02	8293.67	1.26
20	18893.00	90.95	90.81	10771.35	8387.65	246.62	8387.65	0.33
21	18987.00	90.77	90.90	10769.94	8481.62	245.21	8481.62	0.21
22	19018.00	90.15	91.69	10769.69	8512.61	244.51	8512.61	3.24
23	19050.00	90.55	91.69	10769.50	8544.60	243.57	8544.60	1.25
24	19081.00	90.95	91.42	10769.09	8575.59	242.73	8575.59	1.56
25	19112.00	91.25	91.51	10768.49	8606.57	241.93	8606.57	1.01
26	19144.00	89.98	91.33	10768.15	8638.56	241.14	8638.56	4.01
27	19175.00	90.02	91.60	10768.15	8669.55	240.35	8669.55	0.88
28	19207.00	88.53	91.33	10768.56	8701.53	239.53	8701.53	4.73
29	19269.00	86.95	91.42	10771.00	8763.47	238.04	8763.47	2.55
30	19300.00	87.25	91.51	10772.57	8794.42	237.25	8794.42	1.01
31	19331.00	87.69	91.51	10773.94	8825.37	236.44	8825.37	1.42
32	19363.00	87.56	91.25	10775.26	8857.34	235.67	8857.34	0.91
33	19426.00	88.48	91.07	10777.44	8920.29	234.39	8920.29	1.49

34	19457.00	89.54	90.10	10777.98	8951.28	234.08	8951.28	4.63
35	19520.00	89.41	88.08	10778.55	9014.27	235.08	9014.27	3.21
36	19551.00	89.41	87.29	10778.87	9045.24	236.33	9045.24	2.55
37	19614.00	89.93	87.03	10779.24	9108.16	239.45	9108.16	0.92
38	19646.00	90.42	87.29	10779.14	9140.12	241.04	9140.12	1.73
39	19740.00	91.16	86.32	10777.84	9233.96	246.27	9233.96	1.30
40	19771.00	91.38	86.41	10777.15	9264.89	248.24	9264.89	0.77
41	19834.00	91.38	85.71	10775.64	9327.73	252.57	9327.73	1.11
42	19865.00	90.33	88.17	10775.17	9358.68	254.22	9358.68	8.63
43	19928.00	90.73	87.47	10774.59	9421.63	256.62	9421.63	1.28
44	19960.00	90.99	88.96	10774.11	9453.61	257.61	9453.61	4.73
45	19991.00	91.30	87.73	10773.49	9484.59	258.51	9484.59	4.09
46	20022.00	91.30	88.96	10772.79	9515.57	259.40	9515.57	3.97
47	20054.00	91.52	87.91	10772.00	9547.54	260.28	9547.54	3.35
48	20117.00	89.63	89.63	10771.37	9610.52	261.63	9610.52	4.06
49	20180.00	88.35	91.77	10772.48	9673.50	260.86	9673.50	3.96
50	20211.00	88.62	90.63	10773.30	9704.48	260.21	9704.48	3.78
51	20305.00	89.19	92.13	10775.10	9798.44	257.95	9798.44	1.71
52	20400.00	89.67	90.81	10776.04	9893.40	255.51	9893.40	1.48
PROJ	20475.00	89.67	90.81	10776.47	9968.39	254.45	9968.39	0.00

Kline Federal 5300 41-18 10B LITHOLOGY

Geologists caught lagged samples in 30' intervals in the vertical hole, from 8,350' to 10,240' MD; 30' intervals in the curve build from 10,860' to 11,175' MD; and 50' samples in the lateral from 11,175' to TD at 20,475'

Electric geophysical log, sample and/or MWD gamma ray markers and tops are included in the sample descriptions below for reference. Samples were examined wet and dry under a binocular microscope in approximately 30' to 50' intervals. Sample descriptions begin in the **Kibbey Formation**. The drilling fluid was diesel invert in the vertical and curve, and salt water brine in the lateral.

Drilling vertical hole in Tyler Formation

8350-8376 SILTSTONE: reddish brown, occasional, gray to light gray, brown to light brown gray, soft, sub blocky, earthy texture, no visible porosity, no visible oil stain

Kibbey Lime *8,376' MD, 8,376' TVD (-6,294')*

8376-8410 SILTSTONE: brown, occasional, gray to light gray, brown to light brown gray, soft, sub blocky, earthy texture, no visible porosity, no visible oil stain; LIMESTONE: wackestone, light gray to medium gray, light gray brown to medium gray brown, occasional off white friable to firm, crystalline to microcrystalline

8410-8440 SILTY SANDSTONE: medium gray, firm to friable, rounded, well sorted, moderately cemented, calcite cement, possible intergranular porosity, no visible oil stain; SILTSTONE: reddish brown, occasional, gray to light gray, brown to light brown gray, soft, sub blocky, earthy texture, no visible porosity, no visible oil stain

8440-8470 SILTY SANDSTONE: medium gray, firm to friable, rounded, well sorted, moderately cemented, calcite cement, possible intergranular porosity, no visible oil stain; SILTSTONE: reddish brown, occasional, gray to light gray, brown to light brown gray, soft, sub blocky, earthy texture, no visible porosity, no visible oil stain

8470-8500 SILTY SANDSTONE: medium gray, firm to friable, rounded, well sorted, moderately cemented, calcite cement, possible intergranular porosity, no visible oil stain; SILTSTONE: reddish brown, occasional, gray to light gray, brown to light brown gray, soft, sub blocky, earthy texture, no visible porosity, no visible oil stain

8500-8530 SILTY SANDSTONE: medium gray, firm to friable, rounded, well sorted, moderately cemented, calcite cement, possible intergranular porosity, no visible oil stain; SILTSTONE: reddish brown, occasional, gray to light gray, brown to light brown gray, soft, sub blocky, earthy texture, no visible porosity, no visible oil stain

8530-8566 SILTY SANDSTONE: medium gray, firm to friable, rounded, well sorted, moderately cemented, calcite cement, possible intergranular porosity, no visible oil stain; SILTSTONE: reddish brown, occasional, gray to light gray, brown to light brown gray, soft, sub blocky, earthy texture, no visible porosity, no visible oil stain

8566-8590 SALT: translucent, trace off white, crystalline, firm, crystalline texture, no visible porosity, no visible oil stain

8590-8620 SALT: translucent, trace off white, crystalline, firm, crystalline texture, no visible porosity, no visible oil stain

8620-8650 SALT: translucent, trace off white, crystalline, firm, crystalline texture, no visible porosity, no visible oil stain, LIMESTONE: wackestone, light gray to medium gray, light gray brown to medium gray brown, occasional off white friable to firm, crystalline to microcrystalline

8650-8680 SALT: translucent, trace off white, crystalline, firm, crystalline texture, no visible porosity, no visible oil stain, LIMESTONE: wackestone, light gray to medium gray, light gray brown to medium gray brown, occasional off white friable to firm, crystalline to microcrystalline

8680-8710 SALT: translucent, trace off white, crystalline, firm, crystalline texture, no visible porosity, no visible oil stain

8710-8740 SALT: translucent, trace off white, crystalline, firm, crystalline texture, no visible porosity, no visible oil stain, LIMESTONE: wackestone, light gray to medium gray, light gray brown to medium gray brown, occasional off white friable to firm, crystalline to microcrystalline

8740-8770 SALT: translucent, trace off white, crystalline, firm, crystalline texture, no visible porosity, no visible oil stain, LIMESTONE: wackestone, light gray to medium gray, light gray brown to medium gray brown, occasional off white friable to firm, crystalline to microcrystalline

8770-8800 SALT: translucent, trace off white, crystalline, firm, crystalline texture, no visible porosity, no visible oil stain, LIMESTONE: wackestone, light gray to medium gray, light gray brown to medium gray brown, occasional off white friable to firm, crystalline to microcrystalline

8800-8830 SALT: translucent, trace off white, crystalline, firm, crystalline texture, no visible porosity, no visible oil stain, LIMESTONE: wackestone, light gray to medium gray, light gray brown to medium gray brown, occasional off white friable to firm, crystalline to microcrystalline

8830-8860 SALT: translucent, trace off white, crystalline, firm, crystalline texture, no visible porosity, no visible oil stain, LIMESTONE: wackestone, light gray to medium gray, light gray brown to medium gray brown, occasional off white friable to firm, crystalline to microcrystalline

8860-8890 SALT: translucent, trace off white, crystalline, firm, crystalline texture, no visible porosity, no visible oil stain, LIMESTONE: wackestone, light gray to medium gray, light gray brown to medium gray brown, occasional off white friable to firm, crystalline to microcrystalline

8890-8920 SALT: translucent, trace off white, crystalline, firm, crystalline texture, no visible porosity, no visible oil stain, LIMESTONE: wackestone, light gray to medium gray, light gray brown to medium gray brown, occasional off white friable to firm, crystalline to microcrystalline

8920-8950 SALT: translucent, trace off white, crystalline, firm, crystalline texture, no visible porosity, no visible oil stain

8950-8980 SALT: translucent, trace off white, crystalline, firm, crystalline texture, no visible porosity, no visible oil stain, LIMESTONE: wackestone, light gray to medium gray, light gray brown to medium gray brown, occasional off white friable to firm, crystalline to microcrystalline

8980-9010 SALT: translucent, trace off white, crystalline, firm, crystalline texture, no visible porosity, no visible oil stain, LIMESTONE: wackestone, light gray to medium gray, light gray brown to medium gray brown, occasional off white friable to firm, crystalline to microcrystalline

9010-9040 SALT: translucent, trace off white, crystalline, firm, crystalline texture, no visible porosity, no visible oil stain, LIMESTONE: wackestone, light gray to medium gray, light gray brown to medium gray brown, occasional off white friable to firm, crystalline to microcrystalline

9040-9070 SALT: translucent, trace off white, crystalline, firm, crystalline texture, no visible porosity, no visible oil stain, LIMESTONE: wackestone, light gray to medium gray, light gray brown to medium gray brown, occasional off white friable to firm, crystalline to microcrystalline

9070-9100 SALT: translucent, trace off white, crystalline, firm, crystalline texture, no visible porosity, no visible oil stain, LIMESTONE: wackestone, light gray to medium gray, light gray brown to medium gray brown, occasional off white friable to firm, crystalline to microcrystalline

9100-9130 SALT: translucent, trace off white, crystalline, firm, crystalline texture, no visible porosity, no visible oil stain, LIMESTONE: wackestone, light gray to medium gray, light gray brown to medium gray brown, occasional off white friable to firm, crystalline to microcrystalline

9130-9160 SALT: translucent, trace off white, crystalline, firm, crystalline texture, no visible porosity, no visible oil stain, LIMESTONE: wackestone, light gray to medium gray, light gray brown to medium gray brown, occasional off white friable to firm, crystalline to microcrystalline

9160-9206 SALT: translucent, trace off white, crystalline, firm, crystalline texture, no visible porosity, no visible oil stain, LIMESTONE: wackestone, light gray to medium gray, light gray brown to medium gray brown, occasional off white friable to firm, crystalline to microcrystalline

Base Charles Salt *9,206' MD, 9,206' TVD (-7,124')*

9160-9190 SALT: translucent, trace off white, crystalline, firm, crystalline texture, no visible porosity, no visible oil stain, LIMESTONE: wackestone, light gray to medium gray, light gray brown to medium gray brown, occasional off white friable to firm, crystalline to microcrystalline

9206-9220 LIMESTONE: wackestone, light gray to medium gray, light gray brown to medium gray brown, occasional off white friable to firm, crystalline to microcrystalline

9220-9250 LIMESTONE: wackestone, light gray to medium gray, light gray brown to medium gray brown, occasional off white friable to firm, crystalline to microcrystalline

9250-9280 LIMESTONE: wackestone, light gray to medium gray, light gray brown to medium gray brown, occasional off white friable to firm, crystalline to microcrystalline

9280-9310 LIMESTONE: wackestone, light gray to medium gray, light gray brown to medium gray brown, occasional off white friable to firm, crystalline to microcrystalline

9310-9340 LIMESTONE: wackestone, light gray to medium gray, light gray brown to medium gray brown, occasional off white friable to firm, crystalline to microcrystalline

9340-9370 LIMESTONE: wackestone, light gray to medium gray, light gray brown to medium gray brown, occasional off white friable to firm, crystalline to microcrystalline

9370-9400 LIMESTONE: wackestone, light gray to medium gray, light gray brown to medium gray brown, occasional off white friable to firm, crystalline to microcrystalline

9400-9428 LIMESTONE: wackestone, light gray to medium gray, light gray brown to medium gray brown, occasional off white friable to firm, crystalline to microcrystalline

Mission Canyon ***9,428 MD, 9,428' TVD (-7,346')***

9428-9460 LIMESTONE: wackestone, light gray to medium gray, light gray brown to medium gray brown, occasional off white friable to firm, crystalline to microcrystalline

9460-9490 LIMESTONE: wackestone, light gray to medium gray, light gray brown to medium gray brown, occasional off white friable to firm, crystalline to microcrystalline

9490-9520 LIMESTONE: wackestone, light gray to medium gray, light gray brown to medium gray brown, occasional off white friable to firm, crystalline to microcrystalline

9520-9550 LIMESTONE: wackestone, light gray to medium gray, light gray brown to medium gray brown, occasional off white friable to firm, crystalline to microcrystalline

9550-9580 LIMESTONE: wackestone, light gray to medium gray, light gray brown to medium gray brown, occasional off white friable to firm, crystalline to microcrystalline

9580-9610 LIMESTONE: wackestone, light gray to medium gray, light gray brown to medium gray brown, occasional off white friable to firm, crystalline to microcrystalline

9610-9640 LIMESTONE: wackestone, light gray to medium gray, light gray brown to medium gray brown, occasional off white friable to firm, crystalline to microcrystalline

9640-9670 LIMESTONE: wackestone, light gray to medium gray, light gray brown to medium gray brown, occasional off white friable to firm, crystalline to microcrystalline

9670-9700 LIMESTONE: wackestone, light gray to medium gray, light gray brown to medium gray brown, occasional off white friable to firm, crystalline to microcrystalline

9700-9730 LIMESTONE: wackestone, light gray to medium gray, light gray brown to medium gray brown, occasional off white friable to firm, crystalline to microcrystalline

9730-9760 LIMESTONE: wackestone, light gray to medium gray, light gray brown to medium gray brown, occasional off white friable to firm, crystalline to microcrystalline

9760-9790 LIMESTONE: wackestone, light gray to medium gray, light gray brown to medium gray brown, occasional off white friable to firm, crystalline to microcrystalline

9790-9820 LIMESTONE: wackestone, light gray to medium gray, light gray brown to medium gray brown, occasional off white friable to firm, crystalline to microcrystalline

9820-9850 LIMESTONE: wackestone, light gray to medium gray, light gray brown to medium gray brown, occasional off white friable to firm, crystalline to microcrystalline

9850-9880 LIMESTONE: wackestone, light gray to medium gray, light gray brown to medium gray brown, occasional off white friable to firm, crystalline to microcrystalline

9880-9910 LIMESTONE: wackestone, light gray to medium gray, light gray brown to medium gray brown, occasional off white friable to firm, crystalline to microcrystalline

9910-9940 LIMESTONE: wackestone, light gray to medium gray, light gray brown to medium gray brown, occasional off white friable to firm, crystalline to microcrystalline

9940-9980 LIMESTONE: wackestone, light gray to medium gray, light gray brown to medium gray brown, occasional off white friable to firm, crystalline to microcrystalline

Lodgepole ***9,980 MD, 9,980' TVD (-7,898')***

9880-9910 LIMESTONE: wackestone, light gray to medium gray, light gray brown to medium gray brown, occasional off white friable to firm, crystalline to microcrystalline

9910-9940 LIMESTONE: wackestone, light gray to medium gray, light gray brown to medium gray brown, occasional off white friable to firm, crystalline to microcrystalline

9940-9970 LIMESTONE: wackestone, light gray to medium gray, light gray brown to medium gray brown, occasional off white friable to firm, crystalline to microcrystalline

9980-10000 LIMESTONE: wackestone, light gray to medium gray, light gray brown to medium gray brown, occasional off white friable to firm, crystalline to microcrystalline

10000-10030 ARGILLACEOUS LIMESTONE: wackestone, medium gray brown to light gray brown, firm, crystalline texture, trace sparry calcareous, carbonaceous, possible intercrystalline porosity, possible slightly light brown spotty oil stain

10030-10060 ARGILLACEOUS LIMESTONE: wackestone, medium gray brown to light gray brown, firm, crystalline texture, trace sparry calcareous, carbonaceous, possible intercrystalline porosity, possible slightly light brown spotty oil stain

10060-10090 ARGILLACEOUS LIMESTONE: wackestone, medium gray brown to light gray brown, firm, crystalline texture, trace sparry calcareous, carbonaceous, possible intercrystalline porosity, possible slightly light brown spotty oil stain

10090-10120 ARGILLACEOUS LIMESTONE: wackestone, medium gray brown to light gray brown, firm, crystalline texture, trace sparry calcareous, carbonaceous, possible intercrystalline porosity, possible slightly light brown spotty oil stain

10120-10150 ARGILLACEOUS LIMESTONE: wackestone, medium gray brown to light gray brown, firm, crystalline texture, trace sparry calcareous, carbonaceous, possible intercrystalline porosity, possible slightly light brown spotty oil stain

10150-10180 ARGILLACEOUS LIMESTONE: wackestone, medium gray brown to light gray brown, firm, crystalline texture, trace sparry calcareous, carbonaceous, possible intercrystalline porosity, possible slightly light brown spotty oil stain

10180-10210 ARGILLACEOUS LIMESTONE: wackestone, medium gray brown to light gray brown, firm, crystalline texture, trace sparry calcareous, carbonaceous, possible intercrystalline porosity, possible slightly light brown spotty oil stain

10210-10240 ARGILLACEOUS LIMESTONE: wackestone, medium gray brown to light gray brown, firm, crystalline texture, trace sparry calcareous, carbonaceous, possible intercrystalline porosity, possible slightly light brown spotty oil stain

10,240' Vertical TD reached @ 03:00 hours CST, 14 November 2014

Drilling curve build in the Lodgepole Formation

10240-10270 ARGILLACEOUS LIMESTONE: wackestone, medium gray brown to light gray brown, firm, crystalline texture, trace sparry calcareous, carbonaceous, possible intercrystalline porosity, possible slightly light brown spotty oil stain

10270-10300 ARGILLACEOUS LIMESTONE: wackestone, medium gray brown to light gray brown, firm, crystalline texture, trace sparry calcareous, carbonaceous, possible intercrystalline porosity, possible slightly light brown spotty oil stain

10300-10330 ARGILLACEOUS LIMESTONE: wackestone, medium gray brown to light gray brown, firm, crystalline texture, trace sparry calcareous, carbonaceous, possible intercrystalline porosity, possible slightly light brown spotty oil stain

10330-10360 ARGILLACEOUS LIMESTONE: wackestone, medium gray brown to light gray brown, firm, crystalline texture, trace sparry calcareous, carbonaceous, possible intercrystalline porosity, possible slightly light brown spotty oil stain

10360-10390 ARGILLACEOUS LIMESTONE: wackestone, medium gray brown to light gray brown, firm, crystalline texture, trace sparry calcareous, carbonaceous, possible intercrystalline porosity, possible slightly light brown spotty oil stain

10390-10420 ARGILLACEOUS LIMESTONE: wackestone, medium gray brown to light gray brown, firm, crystalline texture, trace sparry calcareous, carbonaceous, possible intercrystalline porosity, possible slightly light brown spotty oil stain

10420-10450 ARGILLACEOUS LIMESTONE: wackestone, medium gray brown to light gray brown, firm, crystalline texture, trace sparry calcareous, carbonaceous, possible intercrystalline porosity, possible slightly light brown spotty oil stain

10450-10480 ARGILLACEOUS LIMESTONE: wackestone, medium gray brown to light gray brown, firm, crystalline texture, trace sparry calcareous, carbonaceous, possible intercrystalline porosity, possible slightly light brown spotty oil stain

10480-10510 ARGILLACEOUS LIMESTONE: wackestone, medium gray brown to light gray brown, firm, crystalline texture, trace sparry calcareous, carbonaceous, possible intercrystalline porosity, possible slightly light brown spotty oil stain

10510-10540 ARGILLACEOUS LIMESTONE: wackestone, medium gray brown to light gray brown, firm, crystalline texture, trace sparry calcareous, carbonaceous, possible intercrystalline porosity, possible slightly light brown spotty oil stain

10540-10570 ARGILLACEOUS LIMESTONE: wackestone, medium gray brown to light gray brown, firm, crystalline texture, trace sparry calcareous, carbonaceous, possible intercrystalline porosity, possible slightly light brown spotty oil stain

10570-10600 ARGILLACEOUS LIMESTONE: wackestone, medium gray brown to light gray brown, firm, crystalline texture, trace sparry calcareous, carbonaceous, possible intercrystalline porosity, possible slightly light brown spotty oil stain

10600-10630 ARGILLACEOUS LIMESTONE: wackestone, medium gray brown to light gray brown, firm, crystalline texture, trace sparry calcareous, carbonaceous, possible intercrystalline porosity, possible slightly light brown spotty oil stain

10630-10660 ARGILLACEOUS LIMESTONE: wackestone, medium gray brown to light gray brown, firm, crystalline texture, trace sparry calcareous, carbonaceous, possible intercrystalline porosity, possible slightly light brown spotty oil stain

10660-10690 ARGILLACEOUS LIMESTONE: wackestone, medium gray brown to light gray brown, firm, crystalline texture, trace sparry calcareous, carbonaceous, possible intercrystalline porosity, possible slightly light brown spotty oil stain

10690-10720 ARGILLACEOUS LIMESTONE: wackestone, medium gray brown to light gray brown, firm, crystalline texture, trace sparry calcareous, carbonaceous, possible intercrystalline porosity, possible slightly light brown spotty oil stain

10720-10750 ARGILLACEOUS LIMESTONE: wackestone, medium gray brown to light gray brown, firm, crystalline texture, trace sparry calcareous, carbonaceous, possible intercrystalline porosity, possible slightly light brown spotty oil stain

10750-10780 ARGILLACEOUS LIMESTONE: wackestone, medium gray brown to light gray brown, firm, crystalline texture, trace sparry calcareous, carbonaceous, possible intercrystalline porosity, possible slightly light brown spotty oil stain

10780-10810 ARGILLACEOUS LIMESTONE: wackestone, medium gray brown to light gray brown, firm, crystalline texture, trace sparry calcareous, carbonaceous, possible intercrystalline porosity, possible slightly light brown spotty oil stain

10810-10840 ARGILLACEOUS LIMESTONE: wackestone, medium gray brown to light gray brown, firm, crystalline texture, trace sparry calcareous, carbonaceous, possible intercrystalline porosity, possible slightly light brown spotty oil stain

10840-10864 SHALE: black, dark gray black, firm, sbblky, earthy, calcareous cement, petro, carbonaceous, abundt fine disseminated pyrite, fine laminated; LIMESTONE: wackestone, light gray to medium gray, light gray brown to medium gray brown, occasional off white friable to firm, crystalline to microcrystalline

False Bakken ***10,864' MD, 10,708' TVD (-8,626')***

10864-10890 SHALE: black, dark gray black, firm, sub blocky, earthy, calcareous cement, petro, carbonaceous, abundant fine disseminated pyrite, fine laminated

Upper Bakken Shale ***10,890' MD, 10,716' TVD (-8,634')***

10890-10954 SHALE: black, dark gray black, firm, sub blocky, earthy, calcareous cement, petro, carbonaceous, abundant fine disseminated pyrite, fine laminated

Middle Bakken ***10,954' MD, 10,733' TVD (-8,651')***

10930-10960 SILTY SANDSTONE: common salt and pepper, occasional light gray to medium gray, visible white, very fine grained, soft to firm, moderately to well sorted, rounded to sub rounded, moderately to poorly cemented, visible calcareous fluid fractures, possible fracture porosity, common intergranular porosity, visible light brown spotty oil stain

10960-10990 SILTY SANDSTONE: common salt and pepper, occasional light gray to medium gray, visible white, very fine grained, soft to firm, moderately to well sorted, rounded to sub rounded, moderately to poorly cemented, visible calcareous fluid fractures, possible fracture porosity, common intergranular porosity, visible light brown spotty oil stain

10990-11020 SILTY SANDSTONE: common salt and pepper, occasional light gray to medium gray, visible white, very fine grained, soft to firm, moderately to well sorted, rounded to sub rounded, moderately to poorly cemented, visible calcareous fluid fractures, possible fracture porosity, common intergranular porosity, visible light brown spotty oil stain

11020-11050 SILTY SANDSTONE: common salt and pepper, occasional light gray to medium gray, visible white, very fine grained, soft to firm, moderately to well sorted, rounded to sub rounded, moderately to poorly cemented, visible calcareous fluid fractures, possible fracture porosity, common intergranular porosity, visible light brown spotty oil stain

11050-11080 SILTY SANDSTONE: common salt and pepper, occasional light gray to medium gray, visible white, very fine grained, soft to firm, moderately to well sorted, rounded to sub rounded, moderately to poorly cemented, visible calcareous fluid fractures, possible fracture porosity, common intergranular porosity, visible light brown spotty oil stain

11080-11110 SILTY SANDSTONE: common salt and pepper, occasional light gray to medium gray, visible white, very fine grained, soft to firm, moderately to well sorted, rounded to sub rounded, moderately to poorly cemented, visible calcareous fluid fractures, possible fracture porosity, common intergranular porosity, visible light brown spotty oil stain

11110-11125 SILTY SANDSTONE: common salt and pepper, occasional light gray to medium gray, visible white, very fine grained, soft to firm, moderately to well sorted, rounded to sub rounded, moderately to poorly cemented, visible calcareous fluid fractures, possible fracture porosity, common intergranular porosity, visible light brown spotty oil stain

Curve TD of 11,125' @ 12:00 CST 17 November-2014

Intermediate 7" Casing Set @ 11,185' MD

11125-11175 SILTY SANDSTONE: common salt and pepper, occasional light gray to medium gray, visible white, very fine grained, soft to firm, moderately to well sorted, rounded to sub rounded, moderately to poorly cemented, visible calcareous fluid fractures, possible fracture porosity, common intergranular porosity, visible light brown spotty oil stain

11175-11200 SILTY SANDSTONE: common salt and pepper, occasional light gray to medium gray, visible white, very fine grained, soft to firm, moderately to well sorted, rounded to sub rounded, moderately to poorly cemented, visible calcareous fluid fractures, possible fracture porosity, common intergranular porosity, visible light brown spotty oil stain

11200-11250 SILTY SANDSTONE: common salt and pepper, occasional light gray to medium gray, visible white, very fine grained, soft to firm, moderately to well sorted, rounded to sub rounded, moderately to poorly cemented, visible calcareous fluid fractures, possible fracture porosity, common intergranular porosity, visible light brown spotty oil stain

11250-11300 SILTY SANDSTONE: salt and pepper, common light gray to medium gray, occasional light brown to tan, occasional visible white, very fine grained, soft to firm, moderately to well sorted, sub rounded to sub angular, moderately to poorly cemented, visible calcareous fluid fractures, possible fracture porosity, common intergranular porosity, visible light brown spotty oil stain

11300-11350 SILTY SANDSTONE: salt and pepper, common light gray to medium gray, occasional light brown to tan, occasional visible white, very fine grained, soft to firm, moderately to well sorted, sub rounded to sub angular, moderately to poorly cemented, visible calcareous fluid fractures, possible fracture porosity, common intergranular porosity, visible light brown spotty oil stain

11350-11400 SILTY SANDSTONE: salt and pepper, common light gray to medium gray, cc light brown to tan, occasional visible white, very fine grained, soft to firm, moderately to well sorted, sub rounded to sub angular, moderately to poorly cemented, visible calcareous fluid fractures, possible fracture porosity, common intergranular porosity, visible light brown spotty oil stain

11400-11450 SILTY SANDSTONE: salt and pepper, common light gray to medium gray, common white, rare tan, very fine grained, soft to firm, moderately to well sorted, sub rounded to sub angular, moderately to poorly cemented, visible calcareous fluid fractures, possible fracture porosity, common intergranular porosity, visible light brown spotty oil stain

11450-11500 SILTY SANDSTONE: salt and pepper, common light gray to medium gray, common white, rare tan, very fine grained, soft to firm, moderately to well sorted, sub rounded to sub angular, moderately to poorly cemented, visible calcareous fluid fractures, possible fracture porosity, common intergranular porosity, visible light brown spotty oil stain

11500-11550 SILTY SANDSTONE: salt and pepper, common light gray to medium gray, common white, rare tan, very fine grained, soft to firm, moderately to well sorted, sub rounded to sub angular, moderately to poorly cemented, visible calcareous fluid fractures, possible fracture porosity, common intergranular porosity, visible light brown spotty oil stain

11550-11600 SILTY SANDSTONE: salt and pepper, common light gray to medium gray, common white, rare tan, very fine grained, soft to firm, moderately to well sorted, sub rounded to sub angular, moderately to poorly cemented, visible calcareous fluid fractures, possible fracture porosity, common intergranular porosity, visible light brown spotty oil stain

11600-11650 SILTY SANDSTONE: salt and pepper, common light gray to medium gray, common white, rare tan, very fine grained, soft to firm, moderately to well sorted, sub rounded to sub angular, moderately to poorly cemented, visible calcareous fluid fractures, possible fracture porosity, common intergranular porosity, visible light brown spotty oil stain

11650-11700 SILTY SANDSTONE: salt and pepper, common light gray to medium gray, common white, rare tan, very fine grained, soft to firm, moderately to well sorted, sub rounded to sub angular, moderately to poorly cemented, visible calcareous fluid fractures, possible fracture porosity, common intergranular porosity, visible light brown spotty oil stain

11700-11750 SILTY SANDSTONE: salt and pepper, common light gray to medium gray, common white, rare tan, very fine grained, soft to firm, moderately to well sorted, sub rounded to sub angular, moderately to poorly cemented, visible calcareous fluid fractures, possible fracture porosity, common intergranular porosity, visible light brown spotty oil stain

11750-11800 SILTY SANDSTONE: salt and pepper, common light gray to medium gray, common white, rare tan, very fine grained, soft to firm, moderately to well sorted, sub rounded to sub angular, moderately to poorly cemented, visible calcareous fluid fractures, possible fracture porosity, common intergranular porosity, visible light brown spotty oil stain

11800-11850 SILTY SANDSTONE: salt and pepper, common light gray to medium gray, common white, rare tan, very fine grained, soft to firm, moderately to well sorted, sub rounded to sub angular, moderately to poorly cemented, visible calcareous fluid fractures, possible fracture porosity, common intergranular porosity, visible light brown spotty oil stain

11850-11900 SILTY SANDSTONE: salt and pepper, common light gray to medium gray, common white, rare tan, very fine grained, soft to firm, moderately to well sorted, sub rounded to sub angular, moderately to poorly cemented, visible calcareous fluid fractures, possible fracture porosity, common intergranular porosity, visible light brown spotty oil stain

11900-11950 SILTY SANDSTONE: salt and pepper, common light gray to medium gray, common white, rare tan, very fine grained, soft to firm, moderately to well sorted, sub rounded to sub angular, moderately to poorly cemented, visible calcareous fluid fractures, possible fracture porosity, common intergranular porosity, visible light brown spotty oil stain

11950-12000 SILTY SANDSTONE: light to medium gray, common light to medium brown, occasional white to off white, very fine grained, friable to firm, moderately to well sorted, sub rounded to sub angular, moderately to poorly cemented, visible calcareous fluid fractures, trace disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

12000-12050 SILTY SANDSTONE: light to medium gray, common light to medium brown, occasional white to off white, very fine grained, friable to firm, moderately to well sorted, sub rounded to sub angular, moderately to poorly cemented, visible calcareous fluid fractures, trace disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

12050-12100 SILTY SANDSTONE: light to medium gray, common medium brown, occasional light brown, occasional white to off white, very fine grained, friable to firm, moderately to well sorted, sub rounded to sub angular, moderately to poorly cemented, visible calcareous fluid fractures, rare crystalline pyrite, trace disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

12100-12150 SILTY SANDSTONE: light to medium gray, common medium brown, occasional light brown, occasional white to off white, very fine grained, friable to firm, moderately to well sorted, sub rounded to sub angular, moderately to poorly cemented, visible calcareous fluid fractures, rare crystalline pyrite, trace disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

12150-12200 SILTY SANDSTONE: medium brown, common light to medium gray, occasional white to off white, very fine grained, friable to firm, moderately to well sorted, sub rounded to sub angular, moderately to poorly cemented, visible calcareous fluid fractures, trace disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

12200-12250 SILTY SANDSTONE: medium brown, common light to medium gray, occasional dark brown, rare white to off white, very fine grained, friable to firm, moderately to well sorted, sub rounded to sub angular, moderately to poorly cemented, visible calcareous fluid fractures, trace disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

12250-12300 SILTY SANDSTONE: light to medium gray, common light to medium brown, rare white to off white, very fine grained, friable to firm, moderately to well sorted, sub rounded to sub angular, moderately to poorly cemented, visible calcareous fluid fractures, trace disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

12300-12350 SILTY SANDSTONE: light to medium gray, common light to medium brown, occasional white to off white, very fine grained, friable to firm, moderately to well sorted, sub rounded to sub angular, moderately to poorly cemented, visible calcareous fluid fractures, trace disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

12350-12400 SILTY SANDSTONE: light to medium gray, common light to medium brown, occasional white to off white, very fine grained, friable to firm, moderately to well sorted, sub rounded to sub angular, moderately to poorly cemented, visible calcareous fluid fractures, trace disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

12400-12450 SILTY SANDSTONE: light to medium gray, common light to medium brown, occasional white to off white, very fine grained, friable to firm, moderately to well sorted, sub rounded to sub angular, moderately to poorly cemented, visible calcareous fluid fractures, trace disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

12450-12500 SILTY SANDSTONE: light to medium gray, common light to medium brown, occasional white to off white, very fine grained, friable to firm, moderately to well sorted, sub rounded to sub angular, moderately to poorly cemented, visible calcareous fluid fractures, rare crystalline pyrite, trace disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

12500-12550 SILTY SANDSTONE: light brown to tan, common light to medium gray, common white to off white, occasional medium brown, very fine grained, friable to firm, moderately to well sorted, sub rounded to sub angular, moderately to poorly cemented, visible calcareous fluid fractures, rare crystalline pyrite, trace disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

12550-12600 SILTY SANDSTONE: light to medium gray, common light to medium brown, common white to off white, very fine grained, friable to firm, moderately to well sorted, sub rounded to sub angular, moderately to poorly cemented, visible calcareous fluid fractures, trace crystalline pyrite, trace disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

12600-12650 SILTY SANDSTONE: light to medium gray, common light to medium brown, common white to off white, very fine grained, friable to firm, moderately to well sorted, sub rounded to sub angular, moderately to poorly cemented, visible calcareous fluid fractures, trace crystalline pyrite, trace disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

12650-12700 SILTY SANDSTONE: light to medium gray, common light brown to tan, occasional white to off white, very fine grained, friable to firm, moderately to well sorted, sub rounded to sub angular, moderately to poorly cemented, visible calcareous fluid fractures, trace disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

12700-12750 SILTY SANDSTONE: light to medium gray, common light brown to tan, common white to off white, very fine grained, friable to firm, moderately to well sorted, sub rounded to sub angular, moderately to poorly cemented, visible calcareous fluid fractures, trace disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

12750-12800 SILTY SANDSTONE: light to medium gray, common light brown to tan, common white to off white, very fine grained, friable to firm, moderately to well sorted, sub rounded to sub angular, moderately to poorly cemented, visible calcareous fluid fractures, trace disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

12800-12850 SILTY SANDSTONE: light to medium gray, common light brown to tan, common white to off white, very fine grained, friable to firm, moderately to well sorted, sub rounded to sub angular, moderately to poorly cemented, visible calcareous fluid fractures, trace disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

12850-12900 SILTY SANDSTONE: light to medium gray, common light brown to tan, common white to off white, very fine grained, friable to firm, moderately to well sorted, sub rounded to sub angular, moderately to poorly cemented, visible calcareous fluid fractures, trace disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

12900-12950 SILTY SANDSTONE: light to medium gray, common light brown to tan, common white to off white, very fine grained, friable to firm, moderately to well sorted, sub rounded to sub angular, moderately to poorly cemented, visible calcareous fluid fractures, trace disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

12950-13000 SILTY SANDSTONE: light to medium gray, common light brown to tan, common white to off white, very fine grained, friable to firm, moderately to well sorted, sub rounded to sub angular, moderately to poorly cemented, visible calcareous fluid fractures, trace disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

13000-13050 SILTY SANDSTONE: light to medium gray, common light brown to tan, common white to off white, very fine grained, friable to firm, moderately to well sorted, sub rounded to sub angular, moderately to poorly cemented, visible calcareous fluid fractures, trace disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

13050-13100 SILTY SANDSTONE: light to medium gray, common light brown to tan, common white to off white, very fine grained, friable to firm, moderately to well sorted, sub rounded to sub angular, moderately to poorly cemented, visible calcareous fluid fractures, trace disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

13100-13150 SILTY SANDSTONE: light to medium gray, common light brown to tan, common white to off white, very fine grained, friable to firm, moderately to well sorted, sub rounded to sub angular, moderately to poorly cemented, visible calcareous fluid fractures, trace disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

13150-13200 SILTY SANDSTONE: light to medium gray, common light brown to tan, common white to off white, very fine grained, friable to firm, moderately to well sorted, sub rounded to sub angular, moderately to poorly cemented, visible calcareous fluid fractures, trace disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

13200-13250 SILTY SANDSTONE: light to medium gray, common light brown to tan, common white to off white, very fine grained, friable to firm, moderately to well sorted, sub rounded to sub angular, moderately to poorly cemented, visible calcareous fluid fractures, trace disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

13250-13300 SILTY SANDSTONE: light to medium gray, common light brown to tan, common white to off white, very fine grained, friable to firm, moderately to well sorted, sub rounded to sub angular, moderately to poorly cemented, visible calcareous fluid fractures, trace disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

13300-13350 SILTY SANDSTONE: light to medium gray, common light brown to tan, common white to off white, very fine grained, friable to firm, moderately to well sorted, sub rounded to sub angular, moderately to poorly cemented, visible calcareous fluid fractures, trace disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

13350-13400 SILTY SANDSTONE: light to medium gray, common light brown to tan, common white to off white, very fine grained, friable to firm, moderately to well sorted, sub rounded to sub angular, moderately to poorly cemented, visible calcareous fluid fractures, trace disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

13400-13450 SILTY SANDSTONE: light to medium gray, common light brown to tan, common white to off white, very fine grained, friable to firm, moderately to well sorted, sub rounded to sub angular, moderately to poorly cemented, visible calcareous fluid fractures, trace disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

13450-13500 SILTY SANDSTONE: light to medium gray, common light brown to tan, common white to off white, very fine grained, friable to firm, moderately to well sorted, sub rounded to sub angular, moderately to poorly cemented, visible calcareous fluid fractures, trace disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

13500-13550 SILTY SANDSTONE: light to medium gray, common light brown to tan, common white to off white, very fine grained, friable to firm, moderately to well sorted, sub rounded to sub angular, moderately to poorly cemented, visible calcareous fluid fractures, trace disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

13550-13600 SILTY SANDSTONE: light to medium gray, common light brown to tan, common white to off white, very fine grained, friable to firm, moderately to well sorted, sub rounded to sub angular, moderately to poorly cemented, visible calcareous fluid fractures, trace disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

13600-13650 SILTY SANDSTONE: light to medium gray, common light brown to tan, common white to off white, very fine grained, friable to firm, moderately to well sorted, sub rounded to sub angular, moderately to poorly cemented, visible calcareous fluid fractures, trace disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

13650-13700 SILTY SANDSTONE: light to medium gray, common light brown to tan, common white to off white, very fine grained, friable to firm, moderately to well sorted, sub rounded to sub angular, moderately to poorly cemented, visible calcareous fluid fractures, trace disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

13700-13750 SILTY SANDSTONE: light to medium gray, common light brown to tan, common white to off white, very fine grained, friable to firm, moderately to well sorted, sub rounded to sub angular, moderately to poorly cemented, visible calcareous fluid fractures, trace disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

13750-13800 SILTY SANDSTONE: light to medium gray, common light brown to tan, common white to off white, very fine grained, friable to firm, moderately to well sorted, sub rounded to sub angular, moderately to poorly cemented, visible calcareous fluid fractures, trace disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

13800-13850 SILTY SANDSTONE: light to medium gray, common light brown to tan, common white to off white, very fine grained, friable to firm, moderately to well sorted, sub rounded to sub angular, moderately to poorly cemented, visible calcareous fluid fractures, trace disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

13850-13900 SILTY SANDSTONE: light to medium gray, common light brown to tan, common white to off white, very fine grained, friable to firm, moderately to well sorted, sub rounded to sub angular, moderately to poorly cemented, visible calcareous fluid fractures, trace disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

NOTE: Oil highly visible in sample and coming over shakers

13900-13950 SILTY SANDSTONE: light to medium gray, common light brown to tan, common white to off white, very fine grained, friable to firm, moderately to well sorted, sub rounded to sub angular, moderately to poorly cemented, visible calcareous fluid fractures, trace disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

13950-14000 SILTY SANDSTONE: light to medium gray, common light brown to tan, common white to off white, very fine grained, friable to firm, moderately to well sorted, sub rounded to sub angular, moderately to poorly cemented, visible calcareous fluid fractures, trace disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

14000-14050 SILTY SANDSTONE: light to medium gray, common light brown to tan, common white to off white, very fine grained, friable to firm, moderately to well sorted, sub rounded to sub angular, moderately to poorly cemented, visible calcareous fluid fractures, trace disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

14050-14100 SILTY SANDSTONE: light to medium gray, common light brown to tan, common white to off white, very fine grained, friable to firm, moderately to well sorted, sub rounded to sub angular, moderately to poorly cemented, visible calcareous fluid fractures, trace disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

14100-14150 SILTY SANDSTONE: light to medium gray, common light brown to tan, common white to off white, very fine grained, friable to firm, moderately to well sorted, sub rounded to sub angular, moderately to poorly cemented, visible calcareous fluid fractures, trace disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

14150-14200 SILTY SANDSTONE: light to medium gray, common light brown to tan, common white to off white, very fine grained, friable to firm, moderately to well sorted, sub rounded to sub angular, moderately to poorly cemented, visible calcareous fluid fractures, trace disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

14200-14250 SILTY SANDSTONE: light to medium gray, common light brown to tan, common white to off white, very fine grained, friable to firm, moderately to well sorted, sub rounded to sub angular, moderately to poorly cemented, visible calcareous fluid fractures, trace disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

14250-14300 SILTY SANDSTONE: light to medium gray, common light brown to tan, common white to off white, very fine grained, friable to firm, moderately to well sorted, sub rounded to sub angular, moderately to poorly cemented, visible calcareous fluid fractures, trace disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

14300-14350 SILTY SANDSTONE: light to medium gray, common light brown to tan, common white to off white, very fine grained, friable to firm, moderately to well sorted, sub rounded to sub angular, moderately to poorly cemented, visible calcareous fluid fractures, trace disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

14350-14400 SILTY SANDSTONE: light to medium gray, common light brown to tan, common white to off white, very fine grained, friable to firm, moderately to well sorted, sub rounded to sub angular, moderately to poorly cemented, visible calcareous fluid fractures, trace disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

14400-14450 SILTY SANDSTONE: light to medium gray, common light brown to tan, common white to off white, very fine grained, friable to firm, moderately to well sorted, sub rounded to sub angular, moderately to poorly cemented, visible calcareous fluid fractures, trace disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

14450-14500 SILTY SANDSTONE: light to medium gray, common light brown to tan, common white to off white, very fine grained, friable to firm, moderately to well sorted, sub rounded to sub angular, moderately to poorly cemented, visible calcareous fluid fractures, trace disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

14500-14550 SILTY SANDSTONE: light to medium gray, common light brown to tan, common white to off white, very fine grained, friable to firm, moderately to well sorted, sub rounded to sub angular, moderately to poorly cemented, visible calcareous fluid fractures, trace disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

14550-14600 SILTY SANDSTONE: light to medium gray, common light brown to tan, common white to off white, very fine grained, friable to firm, moderately to well sorted, sub rounded to sub angular, moderately to poorly cemented, visible calcareous fluid fractures, trace disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

14600-14650 SILTY SANDSTONE: light to medium gray, common light brown to tan, common white to off white, very fine grained, friable to firm, moderately to well sorted, sub rounded to sub angular, moderately to poorly cemented, visible calcareous fluid fractures, trace disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

14650-14700 SILTY SANDSTONE: light to medium gray, common light brown to tan, common white to off white, very fine grained, friable to firm, moderately to well sorted, sub rounded to sub angular, moderately to poorly cemented, visible calcareous fluid fractures, trace disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

14700-14750 SILTY SANDSTONE: light to medium gray, common light brown to tan, common white to off white, very fine grained, friable to firm, moderately to well sorted, sub rounded to sub angular, moderately to poorly cemented, visible calcareous fluid fractures, trace disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

14750-14800 SILTY SANDSTONE: light to medium gray, common light brown to tan, common white to off white, very fine grained, friable to firm, moderately to well sorted, sub rounded to sub angular, moderately to poorly cemented, visible calcareous fluid fractures, trace disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

14800-14850 SILTY SANDSTONE: light to medium gray, common light brown to tan, common white to off white, very fine grained, friable to firm, moderately to well sorted, sub rounded to sub angular, moderately to poorly cemented, visible calcareous fluid fractures, trace disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

14850-14900 SILTY SANDSTONE: light to medium gray, common light brown to tan, common white to off white, very fine grained, friable to firm, moderately to well sorted, sub rounded to sub angular, moderately to poorly cemented, visible calcareous fluid fractures, trace disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

NOTE: Oil highly visible in sample and coming over shakers

14900-14950 SILTY SANDSTONE: light to medium gray, common light brown to tan, common white to off white, very fine grained, friable to firm, moderately to well sorted, sub rounded to sub angular, moderately to poorly cemented, visible calcareous fluid fractures, trace disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

14950-15000 SILTY SANDSTONE: light to medium gray, common light brown to tan, common white to off white, very fine grained, friable to firm, moderately to well sorted, sub rounded to sub angular, moderately to poorly cemented, visible calcareous fluid fractures, trace disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

15000-15050 SILTY SANDSTONE: light to medium gray, common light brown to tan, common white to off white, very fine grained, friable to firm, moderately to well sorted, sub rounded to sub angular, moderately to poorly cemented, visible calcareous fluid fractures, trace disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

15050-15100 SILTY SANDSTONE: light to medium gray, common light brown to tan, common white to off white, very fine grained, friable to firm, moderately to well sorted, sub rounded to sub angular, moderately to poorly cemented, visible calcareous fluid fractures, trace disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

15100-15150 SILTY SANDSTONE: light to medium gray, common light brown to tan, common white to off white, very fine grained, friable to firm, moderately to well sorted, sub rounded to sub angular, moderately to poorly cemented, visible calcareous fluid fractures, trace disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

15150-15200 SILTY SANDSTONE: light to medium gray, common light brown to tan, common white to off white, very fine grained, friable to firm, moderately to well sorted, sub rounded to sub angular, moderately to poorly cemented, visible calcareous fluid fractures, trace disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

15200-15250 SILTY SANDSTONE: light to medium gray, common light brown to tan, common white to off white, very fine grained, friable to firm, moderately to well sorted, sub rounded to sub angular, moderately to poorly cemented, visible calcareous fluid fractures, trace disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

15250-15300 SILTY SANDSTONE: light to medium gray, common light brown to tan, common white to off white, very fine grained, friable to firm, moderately to well sorted, sub rounded to sub angular, moderately to poorly cemented, visible calcareous fluid fractures, trace disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

15300-15350 SILTY SANDSTONE: light to medium gray, common light brown to tan, common white to off white, very fine grained, friable to firm, moderately to well sorted, sub rounded to sub angular, moderately to poorly cemented, visible calcareous fluid fractures, trace disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

15350-15400 SILTY SANDSTONE: light to medium gray, common light brown to tan, common white to off white, very fine grained, friable to firm, moderately to well sorted, sub rounded to sub angular, moderately to poorly cemented, visible calcareous fluid fractures, trace disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

15400-15450 SILTY SANDSTONE: light to medium gray, common light brown to tan, common white to off white, very fine grained, friable to firm, moderately to well sorted, sub rounded to sub angular, moderately to poorly cemented, visible calcareous fluid fractures, trace disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

15450-15500 SILTY SANDSTONE: light to medium gray, common light brown to tan, common white to off white, very fine grained, friable to firm, moderately to well sorted, sub rounded to sub angular, moderately to poorly cemented, visible calcareous fluid fractures, trace disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

15500-15550 SILTY SANDSTONE: light to medium gray, common light brown to tan, common white to off white, very fine grained, friable to firm, moderately to well sorted, sub rounded to sub angular, moderately to poorly cemented, visible calcareous fluid fractures, trace disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

15550-15600 SILTY SANDSTONE: light to medium gray, common light brown to tan, common white to off white, very fine grained, friable to firm, moderately to well sorted, sub rounded to sub angular, moderately to poorly cemented, visible calcareous fluid fractures, trace disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

15600-15650 SILTY SANDSTONE: light to medium gray, common light brown to tan, common white to off white, very fine grained, friable to firm, moderately to well sorted, sub rounded to sub angular, moderately to poorly cemented, visible calcareous fluid fractures, trace disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

15650-15700 SILTY SANDSTONE: light to medium gray, common light brown to tan, common white to off white, very fine grained, friable to firm, moderately to well sorted, sub rounded to sub angular, moderately to poorly cemented, visible calcareous fluid fractures, trace disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

15700-15750 SILTY SANDSTONE: light to medium gray, common light brown to tan, common white to off white, very fine grained, friable to firm, moderately to well sorted, sub rounded to sub angular, moderately to poorly cemented, visible calcareous fluid fractures, trace disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

15750-15800 SILTY SANDSTONE: light to medium gray, common light brown to tan, common white to off white, very fine grained, friable to firm, moderately to well sorted, sub rounded to sub angular, moderately to poorly cemented, visible calcareous fluid fractures, trace disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

15800-15850 SILTY SANDSTONE: light to medium gray, common light brown to tan, common white to off white, very fine grained, friable to firm, moderately to well sorted, sub rounded to sub angular, moderately to poorly cemented, visible calcareous fluid fractures, trace disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

15850-15900 SILTY SANDSTONE: light to medium gray, common light brown to tan, common white to off white, very fine grained, friable to firm, moderately to well sorted, sub rounded to sub angular, moderately to poorly cemented, visible calcareous fluid fractures, trace disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

15900-15950 SILTY SANDSTONE: light to medium gray, common light brown to tan, common white to off white, very fine grained, friable to firm, moderately to well sorted, sub rounded to sub angular, moderately to poorly cemented, visible calcareous fluid fractures, trace disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

15950-16000 SILTY SANDSTONE: light to medium gray, common light brown to tan, common white to off white, very fine grained, friable to firm, moderately to well sorted, sub rounded to sub angular, moderately to poorly cemented, visible calcareous fluid fractures, trace disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

16000-16050 SILTY SANDSTONE: light to medium gray, common light brown to tan, common white to off white, very fine grained, friable to firm, moderately to well sorted, sub rounded to sub angular, moderately to poorly cemented, visible calcareous fluid fractures, trace disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

16050-16100 SILTY SANDSTONE: light to medium gray, common light brown to tan, common white to off white, very fine grained, friable to firm, moderately to well sorted, sub rounded to sub angular, moderately to poorly cemented, visible calcareous fluid fractures, trace disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

16100-16150 SILTY SANDSTONE: light to medium gray, common light brown to tan, common white to off white, very fine grained, friable to firm, moderately to well sorted, sub rounded to sub angular, moderately to poorly cemented, visible calcareous fluid fractures, trace disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

16150-16200 SILTY SANDSTONE: light to medium gray, common light brown to tan, common white to off white, very fine grained, friable to firm, moderately to well sorted, sub rounded to sub angular, moderately to poorly cemented, visible calcareous fluid fractures, trace disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

16200-16250 SILTY SANDSTONE: light to medium gray, common light brown to tan, common white to off white, very fine grained, friable to firm, moderately to well sorted, sub rounded to sub angular, moderately to poorly cemented, visible calcareous fluid fractures, trace disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

16250-16300 SILTY SANDSTONE: light to medium gray, common light brown to tan, common white to off white, very fine grained, friable to firm, moderately to well sorted, sub rounded to sub angular, moderately to poorly cemented, visible calcareous fluid fractures, trace disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

16300-16350 SILTY SANDSTONE: light to medium gray, common light brown to tan, common white to off white, very fine grained, friable to firm, moderately to well sorted, sub rounded to sub angular, moderately to poorly cemented, visible calcareous fluid fractures, trace disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

16350-16400 SILTY SANDSTONE: light to medium gray, common light brown to tan, common white to off white, very fine grained, friable to firm, moderately to well sorted, sub rounded to sub angular, moderately to poorly cemented, visible calcareous fluid fractures, trace disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

16400-16450 SILTY SANDSTONE: light to medium gray, common light brown to tan, common white to off white, very fine grained, friable to firm, moderately to well sorted, sub rounded to sub angular, moderately to poorly cemented, visible calcareous fluid fractures, trace disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

16450-16500 SILTY SANDSTONE: light to medium gray, common light brown to tan, common white to off white, very fine grained, friable to firm, moderately to well sorted, sub rounded to sub angular, moderately to poorly cemented, visible calcareous fluid fractures, trace disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

16500-16550 SILTY SANDSTONE: light to medium gray, common light brown to tan, common white to off white, very fine grained, friable to firm, moderately to well sorted, sub rounded to sub angular, moderately to poorly cemented, visible calcareous fluid fractures, trace disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

16550-16600 SILTY SANDSTONE: light to medium gray, common light brown to tan, common white to off white, very fine grained, friable to firm, moderately to well sorted, sub rounded to sub angular, moderately to poorly cemented, visible calcareous fluid fractures, trace disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

16600-16650 SILTY SANDSTONE: light to medium gray, common light brown to tan, common white to off white, very fine grained, friable to firm, moderately to well sorted, sub rounded to sub angular, moderately to poorly cemented, visible calcareous fluid fractures, trace disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

16650-16700 SILTY SANDSTONE: light to medium gray, common light brown to tan, common white to off white, very fine grained, friable to firm, moderately to well sorted, sub rounded to sub angular, moderately to poorly cemented, visible calcareous fluid fractures, trace disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

16700-16750 SILTY SANDSTONE: light to medium gray, common light brown to tan, common white to off white, very fine grained, friable to firm, moderately to well sorted, sub rounded to sub angular, moderately to poorly cemented, visible calcareous fluid fractures, trace disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

16750-16800 SILTY SANDSTONE: light to medium gray, common light brown to tan, common white to off white, very fine grained, friable to firm, moderately to well sorted, sub rounded to sub angular, moderately to poorly cemented, visible calcareous fluid fractures, trace disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

NOTE: Oil highly visible in sample and coming over shakers

16800-16850 SILTY SANDSTONE: light to medium gray, common light brown to tan, common white to off white, very fine grained, friable to firm, moderately to well sorted, sub rounded to sub angular, moderately to poorly cemented, visible calcareous fluid fractures, trace disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

16850-16900 SILTY SANDSTONE: light to medium gray, common light brown to tan, common white to off white, very fine grained, friable to firm, moderately to well sorted, sub rounded to sub angular, moderately to poorly cemented, visible calcareous fluid fractures, trace disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

16900-16950 SILTY SANDSTONE: light to medium gray, common light brown to tan, common white to off white, very fine grained, friable to firm, moderately to well sorted, sub rounded to sub angular, moderately to poorly cemented, visible calcareous fluid fractures, trace disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

16950-17000 SILTY SANDSTONE: light to medium gray, common light brown to tan, common white to off white, very fine grained, friable to firm, moderately to well sorted, sub rounded to sub angular, moderately to poorly cemented, visible calcareous fluid fractures, trace disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

17000-17050 SILTY SANDSTONE: light to medium gray, common light brown to tan, common white to off white, very fine grained, friable to firm, moderately to well sorted, sub rounded to sub angular, moderately to poorly cemented, visible calcareous fluid fractures, trace disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

17050-17100 SILTY SANDSTONE: light to medium gray, common light brown to tan, common white to off white, very fine grained, friable to firm, moderately to well sorted, sub rounded to sub angular, moderately to poorly cemented, visible calcareous fluid fractures, trace disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

17100-17150 SILTY SANDSTONE: light to medium gray, common light brown to tan, common white to off white, very fine grained, friable to firm, moderately to well sorted, sub rounded to sub angular, moderately to poorly cemented, visible calcareous fluid fractures, trace disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

17150-17200 SILTY SANDSTONE: light to medium gray, common light brown to tan, common white to off white, very fine grained, friable to firm, moderately to well sorted, sub rounded to sub angular, moderately to poorly cemented, visible calcareous fluid fractures, trace disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

17200-17250 SILTY SANDSTONE: light to medium gray, common light brown to tan, common white to off white, very fine grained, friable to firm, moderately to well sorted, sub rounded to sub angular, moderately to poorly cemented, visible calcareous fluid fractures, trace disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

17250-17300 SILTY SANDSTONE: light to medium gray, common light brown to tan, common white to off white, very fine grained, friable to firm, moderately to well sorted, sub rounded to sub angular, moderately to poorly cemented, visible calcareous fluid fractures, trace disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

17300-17350 SILTY SANDSTONE: light to medium gray, common light brown to tan, common white to off white, very fine grained, friable to firm, moderately to well sorted, sub rounded to sub angular, moderately to poorly cemented, visible calcareous fluid fractures, trace disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

17350-17400 SILTY SANDSTONE: light to medium gray, common light brown to tan, common white to off white, very fine grained, friable to firm, moderately to well sorted, sub rounded to sub angular, moderately to poorly cemented, visible calcareous fluid fractures, trace disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

17400-17450 SILTY SANDSTONE: light to medium gray, common light brown to tan, common white to off white, very fine grained, friable to firm, moderately to well sorted, sub rounded to sub angular, moderately to poorly cemented, visible calcareous fluid fractures, trace disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

17450-17500 SILTY SANDSTONE: light to medium gray, common light brown to tan, common white to off white, very fine grained, friable to firm, moderately to well sorted, sub rounded to sub angular, moderately to poorly cemented, visible calcareous fluid fractures, trace disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

17500-17550 SILTY SANDSTONE: light to medium gray, common light brown to tan, common white to off white, very fine grained, friable to firm, moderately to well sorted, sub rounded to sub angular, moderately to poorly cemented, visible calcareous fluid fractures, trace disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

17550-17600 SILTY SANDSTONE: light to medium gray, common light brown to tan, common white to off white, very fine grained, friable to firm, moderately to well sorted, sub rounded to sub angular, moderately to poorly cemented, visible calcareous fluid fractures, trace disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

17600-16650 SILTY SANDSTONE: light to medium gray, common light brown to tan, common white to off white, very fine grained, friable to firm, moderately to well sorted, sub rounded to sub angular, moderately to poorly cemented, visible calcareous fluid fractures, trace disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

17650-17700 SILTY SANDSTONE: light to medium gray, common light brown to tan, common white to off white, very fine grained, friable to firm, moderately to well sorted, sub rounded to sub angular, moderately to poorly cemented, visible calcareous fluid fractures, trace disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

17700-17750 SILTY SANDSTONE: light to medium gray, common light brown to tan, common white to off white, very fine grained, friable to firm, moderately to well sorted, sub rounded to sub angular, moderately to poorly cemented, visible calcareous fluid fractures, trace disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

17750-17800 SILTY SANDSTONE: light to medium gray, common light brown to tan, common white to off white, very fine grained, friable to firm, moderately to well sorted, sub rounded to sub angular, moderately to poorly cemented, visible calcareous fluid fractures, trace disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

17800-17850 SILTY SANDSTONE: light to medium gray, common light brown to tan, common white to off white, very fine grained, friable to firm, moderately to well sorted, sub rounded to sub angular, moderately to poorly cemented, visible calcareous fluid fractures, trace disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

17850-17900 SILTY SANDSTONE: light to medium gray, common light brown to tan, common white to off white, very fine grained, friable to firm, moderately to well sorted, sub rounded to sub angular, moderately to poorly cemented, visible calcareous fluid fractures, trace disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

17900-17950 SILTY SANDSTONE: light to medium gray, common light brown to tan, common white to off white, very fine grained, friable to firm, moderately to well sorted, sub rounded to sub angular, moderately to poorly cemented, visible calcareous fluid fractures, trace disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

17950-18000 SILTY SANDSTONE: light to medium gray, common light brown to tan, common white to off white, very fine grained, friable to firm, moderately to well sorted, sub rounded to sub angular, moderately to poorly cemented, visible calcareous fluid fractures, trace disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

18000-18050 SILTY SANDSTONE: light to medium gray, common light brown to tan, common white to off white, very fine grained, friable to firm, moderately to well sorted, sub rounded to sub angular, moderately to poorly cemented, visible calcareous fluid fractures, trace disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

18050-18100 SILTY SANDSTONE: light to medium gray, common light brown to tan, common white to off white, very fine grained, friable to firm, moderately to well sorted, sub rounded to sub angular, moderately to poorly cemented, visible calcareous fluid fractures, trace disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

18100-18150 SILTY SANDSTONE: light to medium gray, common light brown to tan, common white to off white, very fine grained, friable to firm, well sorted, sub angular, moderately to well cemented, visible calcareous fluid fractures, occasional disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

18150-18200 SILTY SANDSTONE: light to medium gray, common light brown to tan, common white to off white, very fine grained, friable to firm, well sorted, sub angular, moderately to well cemented, visible calcareous fluid fractures, occasional disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

18200-18250 SILTY SANDSTONE: light to medium gray, common light brown to tan, common white to off white, very fine grained, friable to firm, well sorted, sub angular, moderately to well cemented, visible calcareous fluid fractures, occasional disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

18250-18300 SILTY SANDSTONE: light to medium gray, common light brown to tan, common white to off white, very fine grained, friable to firm, well sorted, sub angular, moderately to well cemented, visible calcareous fluid fractures, occasional disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

18300-18350 SILTY SANDSTONE: light to medium gray, common light brown to tan, common white to off white, very fine grained, friable to firm, well sorted, sub angular, moderately to well cemented, visible calcareous fluid fractures, occasional disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

18350-18400 SILTY SANDSTONE: light to medium gray, common light brown to tan, common white to off white, very fine grained, friable to firm, well sorted, sub angular, moderately to well cemented, visible calcareous fluid fractures, occasional disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

18400-18450 SILTY SANDSTONE: light to medium gray, common light brown to tan, common white to off white, very fine grained, friable to firm, well sorted, sub angular, moderately to well cemented, visible calcareous fluid fractures, occasional disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

18450-18500 SILTY SANDSTONE: light to medium gray, common light brown to tan, common white to off white, very fine grained, friable to firm, well sorted, sub angular, moderately to well cemented, visible calcareous fluid fractures, occasional disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

18500-18550 SILTY SANDSTONE: light to medium gray, common light brown to tan, common white to off white, very fine grained, friable to firm, well sorted, sub angular, moderately to well cemented, visible calcareous fluid fractures, occasional disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

18550-18600 SILTY SANDSTONE: light to medium gray, common light brown to tan, common white to off white, very fine grained, friable to firm, well sorted, sub angular, moderately to well cemented, visible calcareous fluid fractures, occasional disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

18600-18650 SILTY SANDSTONE: light to medium gray, common light brown to tan, common white to off white, very fine grained, friable to firm, well sorted, sub angular, moderately to well cemented, visible calcareous fluid fractures, occasional disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

18650-18700 SILTY SANDSTONE: light to medium gray, common light brown to tan, common white to off white, very fine grained, friable to firm, well sorted, sub angular, moderately to well cemented, visible calcareous fluid fractures, occasional disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

18700-18750 SILTY SANDSTONE: light to medium gray, common light brown to tan, common white to off white, very fine grained, friable to firm, well sorted, sub angular, moderately to well cemented, visible calcareous fluid fractures, occasional disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

18750-18800 SILTY SANDSTONE: light to medium gray, common light brown to tan, common white to off white, very fine grained, friable to firm, well sorted, sub angular, moderately to well cemented, visible calcareous fluid fractures, occasional disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

18800-18850 SILTY SANDSTONE: light to medium gray, common light brown to tan, common white to off white, very fine grained, friable to firm, moderately to well sorted, sub angular, moderately to well cemented, visible calcareous fluid fractures, common disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

18850-18900 SILTY SANDSTONE: light to medium gray, common light brown to tan, common white to off white, very fine grained, friable to firm, moderately to well sorted, sub angular, moderately to well cemented, visible calcareous fluid fractures, common disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

18900-18950 SILTY SANDSTONE: light to medium gray, common light brown to tan, common white to off white, very fine grained, friable to firm, moderately to well sorted, sub angular, moderately to well cemented, visible calcareous fluid fractures, common disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

18950-19000 SILTY SANDSTONE: light to medium gray, common light brown to tan, common white to off white, very fine grained, friable to firm, moderately to well sorted, sub angular to angular, moderately to well cemented, visible calcareous fluid fractures, common disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

19000-19050 SILTY SANDSTONE: light to medium gray, common light brown to tan, common white to off white, very fine grained, friable to firm, moderately to well sorted, sub angular to angular, moderately to well cemented, visible calcareous fluid fractures, common disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

19050-19100 SILTY SANDSTONE: light to medium gray, common light brown to tan, common white to off white, very fine grained, friable to firm, moderately to well sorted, sub angular to angular, moderately to well cemented, visible calcareous fluid fractures, common disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

19100-19150 SILTY SANDSTONE: light to medium gray, common light brown to tan, common white to off white, very fine grained, friable to firm, moderately to well sorted, sub angular to angular, moderately to well cemented, visible calcareous fluid fractures, common disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

19150-19200 SILTY SANDSTONE: light to medium gray, common white to off white, occasional light brown to tan very fine grained, friable to firm, moderately to well sorted, sub angular to angular, moderately to well cemented, visible calcareous fluid fractures, common disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

19200-19250 SILTY SANDSTONE: light to medium gray, common white to off white, occasional light brown to tan very fine grained, friable to firm, moderately to well sorted, sub angular to angular, moderately to well cemented, visible calcareous fluid fractures, common disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

19250-19300 SILTY SANDSTONE: light to medium gray, common white to off white, occasional light brown to tan very fine grained, friable to firm, moderately to well sorted, sub angular to angular, moderately to well cemented, visible calcareous fluid fractures, common disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

19300-19350 SILTY SANDSTONE: light to medium gray, common white to off white, occasional light brown to tan very fine grained, friable to firm, moderately to well sorted, sub angular to angular, moderately to well cemented, visible calcareous fluid fractures, common disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

19350-19400 SILTY SANDSTONE: light to medium gray, common white to off white, occasional light brown to tan very fine grained, friable to firm, moderately to well sorted, sub angular to angular, moderately to well cemented, visible calcareous fluid fractures, common disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

19400-19450 SILTY SANDSTONE: light to medium gray, common white to off white, occasional light brown to tan very fine grained, friable to firm, moderately to well sorted, sub angular to angular, moderately to well cemented, visible calcareous fluid fractures, common disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

19450-19500 SILTY SANDSTONE: light to medium gray, common white to off white, occasional light brown to tan very fine grained, friable to firm, moderately to well sorted, sub angular to angular, moderately to well cemented, visible calcareous fluid fractures, common disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

19500-19550 SILTY SANDSTONE: light to medium gray, common white to off white, occasional light brown to tan very fine grained, friable to firm, moderately to well sorted, sub angular to angular, moderately to well cemented, visible calcareous fluid fractures, common disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

19550-19600 SILTY SANDSTONE: light to medium gray, common white to off white, occasional light brown to tan very fine grained, friable to firm, moderately to well sorted, sub angular to angular, moderately to well cemented, visible calcareous fluid fractures, common disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

19600-19650 SILTY SANDSTONE: light to medium gray, common white to off white, occasional light brown to tan very fine grained, friable to firm, moderately to well sorted, sub angular to angular, moderately to well cemented, visible calcareous fluid fractures, common disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

19650-19700 SILTY SANDSTONE: light to medium gray, common white to off white, occasional light brown to tan very fine grained, friable to firm, moderately to well sorted, sub angular to angular, moderately to well cemented, visible calcareous fluid fractures, common disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

19700-19750 SILTY SANDSTONE: light to medium gray, common white to off white, occasional light brown to tan very fine grained, friable to firm, moderately to well sorted, sub angular to angular, moderately to well cemented, visible calcareous fluid fractures, common disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

19750-19800 SILTY SANDSTONE: light to medium gray, common white to off white, occasional light brown to tan very fine grained, friable to firm, moderately to well sorted, sub angular to angular, moderately to well cemented, visible calcareous fluid fractures, common disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

19800-19850 SILTY SANDSTONE: light to medium gray, common white to off white, occasional light brown to tan very fine grained, friable to firm, moderately to well sorted, sub angular to angular, moderately to well cemented, visible calcareous fluid fractures, common disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

19850-19900 SILTY SANDSTONE: light to medium gray, common white to off white, occasional light brown to tan very fine grained, friable to firm, moderately to well sorted, sub angular, moderately to well cemented, visible calcareous fluid fractures, common disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

19900-19950 SILTY SANDSTONE: light to medium gray, common white to off white, occasional light brown to tan very fine grained, friable to firm, moderately to well sorted, sub angular, moderately to well cemented, visible calcareous fluid fractures, common disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

19950-20000 SILTY SANDSTONE: light to medium gray, common white to off white, occasional light brown to tan very fine grained, friable to firm, moderately to well sorted, sub angular, moderately to well cemented, visible calcareous fluid fractures, common disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

20000-20050 SILTY SANDSTONE: light to medium gray, common white to off white, occasional light brown to tan very fine grained, friable to firm, moderately to well sorted, sub angular to angular, moderately to well cemented, visible calcareous fluid fractures, common disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

20050-20100 SILTY SANDSTONE: light to medium gray, common white to off white, occasional light brown to tan very fine grained, friable to firm, moderately to well sorted, sub angular to angular, moderately to well cemented, visible calcareous fluid fractures, common disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

20100-20150 SILTY SANDSTONE: light to medium gray, common white to off white, occasional light brown to tan very fine grained, friable to firm, moderately to well sorted, sub angular to angular, moderately to well cemented, visible calcareous fluid fractures, common disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

20150-20200 SILTY SANDSTONE: light to medium gray, common white to off white, occasional light brown to tan very fine grained, friable to firm, moderately to well sorted, sub angular to angular, moderately to well cemented, visible calcareous fluid fractures, common disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

20200-20250 SILTY SANDSTONE: light to medium gray, common white to off white, occasional light brown to tan very fine grained, friable to firm, moderately to well sorted, sub angular to angular, moderately to well cemented, visible calcareous fluid fractures, common disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

20250-20300 SILTY SANDSTONE: light to medium gray, common white to off white, occasional light brown to tan very fine grained, friable to firm, moderately to well sorted, sub angular to angular, moderately to well cemented, visible calcareous fluid fractures, common disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

20300-20350 SILTY SANDSTONE: light to medium gray, common white to off white, occasional light brown to tan very fine grained, friable to firm, moderately to well sorted, sub angular to angular, moderately to well cemented, visible calcareous fluid fractures, common disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

20350-20400 SILTY SANDSTONE: light to medium gray, common white to off white, occasional light brown to tan very fine grained, friable to firm, moderately to well sorted, sub angular to angular, moderately to well cemented, visible calcareous fluid fractures, common disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

20400-20450 SILTY SANDSTONE: light to medium gray, common white to off white, occasional light brown to tan very fine grained, friable to firm, moderately to well sorted, sub angular to angular, moderately to well cemented, visible calcareous fluid fractures, common disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

20450-20475 SILTY SANDSTONE: light to medium gray, common white to off white, occasional light brown to tan very fine grained, friable to firm, moderately to well sorted, sub angular to angular, moderately to well cemented, visible calcareous fluid fractures, common disseminated pyrite, possible fracture porosity, common intergranular porosity, trace light brown spotty oil stain

20,475' TD reached @ 10:48 hours CST, 31 December 2014

RPM Geologic

28652

Oil and Gas Division

Lynn D. Helms - Director Bruce E. Hicks - Assistant Director
Department of Mineral Resources
Lynn D. Helms - Director
North Dakota Industrial Commission
www.dmr.nd.gov/oilgas

January 8, 2016

Michael Kukuk
OASIS PETRO NO AMER
1001 FANNIN ST. SUITE 1500
HOUSTON, TX 77002

RE: See Attached List of Wells
List Reference WF# 28652

Dear Michael Kukuk:

We have not received the geological reports on the referenced well list. Please submit one paper copy and one digital pdf file of this report for each well.

If you have any questions, please contact Richard Suggs at (701) 328-8020.

Sincerely,

Taylor Roth
Engineering Technician

SUNDRY NOTICES AND REPORTS ON WELLS - FORM 4

INDUSTRIAL COMMISSION OF NORTH DAKOTA
OIL AND GAS DIVISION
600 EAST BOULEVARD DEPT 405
BISMARCK, ND 58505-0840
SFN 5749 (09-2006)

Well File No. **28652**

NOV 2015 RECEIVED ND OIL & GAS DIVISION

PLEASE READ INSTRUCTIONS BEFORE FILLING OUT FORM.
PLEASE SUBMIT THE ORIGINAL AND ONE COPY.

- [ ] Notice of Intent — Approximate Start Date
- [x] Report of Work Done — Date Work Completed: **November 13, 2015**
- [ ] Notice of Intent to Begin a Workover Project that may Qualify for a Tax Exemption Pursuant to NDCC Section 57-51.1-03. — Approximate Start Date

- [ ] Drilling Prognosis
- [ ] Spill Report
- [ ] Redrilling or Repair
- [ ] Shooting
- [ ] Casing or Liner
- [ ] Acidizing
- [ ] Plug Well
- [ ] Fracture Treatment
- [ ] Supplemental History
- [x] Change Production Method
- [ ] Temporarily Abandon
- [ ] Reclamation
- [ ] Other **Well is now on pump**

Well Name and Number				
Kline Federal 5300 41-18 10B				
Footages	Qtr-Qtr	Section	Township	Range
500 F S L 237 F W L	SWSW	18	153 N	100 W
Field	Pool	County		
Baker	Bakken	McKenzie		

24-HOUR PRODUCTION RATE

Before		After	
Oil	Bbls	Oil	Bbls
Water	Bbls	Water	Bbls
Gas	MCF	Gas	MCF

Name of Contractor(s)			
Address	City	State	Zip Code

DETAILS OF WORK

Effective 11/13/2015 the above referenced well is on pump.

End of Tubing: 2-7/8" L-80 tubing @ 10150'

Pump: ESP @ 10114'

Company		Telephone Number
Oasis Petroleum North America LLC		**281-404-9436**
Address		
1001 Fannin, Suite 1500		
City	State	Zip Code
Houston	**TX**	**77002**
Signature	Printed Name	
	Jennifer Swenson	
Title	Date	
Regulatory Specialist	**November 19, 2015**	
Email Address		
jswenson@oasispetroleum.com		

FOR STATE USE ONLY

- [x] Received
- [ ] Approved

Date: 11-30-2015

By: Original Signed By: TAYLOR ROTH

Title: Engineering Technician

T4

WELL COMPLETION OR RECOMPLETION REPORT - FORM 6

INDUSTRIAL COMMISSION OF NORTH DAKOTA
OIL AND GAS DIVISION
600 EAST BOULEVARD DEPT 405
BISMARCK, ND 58505-0840
SFN 2468 (04-2010)

OCT 2015 RECEIVED ND OIL & GAS DIVISION

Well File No. 28652

PLEASE READ INSTRUCTIONS BEFORE FILLING OUT FORM.
PLEASE SUBMIT THE ORIGINAL AND ONE COPY.

Designate Type of Completion
☑ Oil Well ☐ EOR Well ☐ Recompletion ☐ Deepened Well ☐ Added Horizontal Leg ☐ Extended Horizontal Leg
☐ Gas Well ☐ SWD Well ☐ Water Supply Well ☐ Other:

Well Name and Number: Kline Federal 5300 41-18 10B			Spacing Unit Description: Sec. 17/18 T153N R100W
Operator: Oasis Petroleum North America	Telephone Number: (281) 404-9591		Field: Baker
Address: 1001 Fannin, Suite 1500			Pool: Bakken
City: Houston	State: TX	Zip Code: 77002	Permit Type: ☐ Wildcat ☑ Development ☐ Extension

LOCATION OF WELL

At Surface	Qtr-Qtr	Section	Township	Range	County
500 F S L 237 F WL	SWSW	18	153 N	100 W	McKenzie

Spud Date	Date TD Reached	Drilling Contractor and Rig Number	KB Elevation (Ft)	Graded Elevation (Ft)
September 8, 2014	January 1, 2015	Nabors 486	2082	2057

Type of Electric and Other Logs Run (See Instructions)
MWD/GR FROM KOP TO TD; CBL FROM INT. TD TO SURFACE

CASING & TUBULARS RECORD (Report all strings set in well)

Well Bore	String Type	String Size (Inch)	Top Set (MD Ft)	Depth Set (MD Ft)	Hole Size (Inch)	Weight (Lbs/Ft)	Anchor Set (MD Ft)	Packer Set (MD Ft)	Sacks Cement	Top of Cement
Surface Hole	Surface	13 3/8	0	2125	17 1/2	54.5			950	0
Vertical Hole	Intermediate	9 5/8	0	6125	13 1/2	36			1204	2400
Vertical Hole	Intermediate	7	0	11125	8 3/4	32			842	
Lateral1	Liner	4 1/2	10190	20460	6	13.5			510	10190

PERFORATION & OPEN HOLE INTERVALS

Well Bore	Well Bore TD Drillers Depth (MD Ft)	Completion Type	Open Hole/Perforated Interval (MD,Ft) Top	Bottom	Kick-off Point (MD Ft)	Top of Casing Window (MD Ft)	Date Perf'd or Drilled	Date Isolated	Isolation Method	Sacks Cement
Lateral1	~~20475~~	Perforations	11125	~~20460~~	10240		06/26/2015			
	15303			15303						
ST 1	18629		15087	18629						
ST 2	20478		17858	20460						

PRODUCTION

Current Producing Open Hole or Perforated Interval(s), This Completion, Top and Bottom, (MD Ft)							Name of Zone (If Different from Pool Name)
Lateral 1- 11125' to 20460'							
Date Well Completed (SEE INSTRUCTIONS)	Producing Method	Pumping-Size & Type of Pump				Well Status (Producing or Shut-In)	
September 4, 2015	Flowing					Producing	
Date of Test	Hours Tested	Choke Size	Production for Test	Oil (Bbls)	Gas (MCF)	Water (Bbls)	Oil Gravity-API (Corr.)	Disposition of Gas
09/05/2015	24	34 /64		1917	1528	3763	42.0 °	

Flowing Tubing Pressure (PSI)	Flowing Casing Pressure (PSI)	Calculated 24-Hour Rate	Oil (Bbls)	Gas (MCF)	Water (Bbls)	Gas-Oil Ratio
	1850		1917	1528	3763	797

GEOLOGICAL MARKERS

Formation	MD (Ft)	TVD (Ft)
Dakota	**5471**	**5471**
Kibbey Lime	**8376**	**8376**
First Charles Salt	**8566**	**8566**
UB		
Base Last Salt	**9206**	**9206**
Ratcliffe		
Mission Canyon	**9428**	**9428**
Lodgepole	**9980**	**9980**
False Bakken	**10864**	**10706**
Scallion		
Upper Bakken	**10890**	**10715**
Middle Bakken	**10954**	**10733**
Target		

PLUG BACK INFORMATION

Well Bore	Type of Plug	Top (Ft)	Bottom (Ft)	Sacks Cement

CORES CUT

Top (Ft)	Bottom (Ft)	Formation	Top (Ft)	Bottom (Ft)	Formation

Drill Stem Test

Test Date	Formation	Top (Ft)	Bottom (Ft)	BH Temp (°F)	CL ppm	H2S ppm	Shut-in 1 (PSIG)	Shut-in 2 (PSIG)
Drill Pipe Recovery								
Sample Chamber Recovery								

Test Date	Formation	Top (Ft)	Bottom (Ft)	BH Temp (°F)	CL ppm	H2S ppm	Shut-in 1 (PSIG)	Shut-in 2 (PSIG)
Drill Pipe Recovery								
Sample Chamber Recovery								

Test Date	Formation	Top (Ft)	Bottom (Ft)	BH Temp (°F)	CL ppm	H2S ppm	Shut-in 1 (PSIG)	Shut-in 2 (PSIG)
Drill Pipe Recovery								
Sample Chamber Recovery								

Test Date	Formation	Top (Ft)	Bottom (Ft)	BH Temp (°F)	CL ppm	H2S ppm	Shut-in 1 (PSIG)	Shut-in 2 (PSIG)
Drill Pipe Recovery								
Sample Chamber Recovery								

Test Date	Formation	Top (Ft)	Bottom (Ft)	BH Temp (°F)	CL ppm	H2S ppm	Shut-in 1 (PSIG)	Shut-in 2 (PSIG)
Drill Pipe Recovery								
Sample Chamber Recovery								

Well Specific Stimulations

Date Stimulated	Stimulated Formation	Top (Ft)	Bottom (Ft)	Stimulation Stages	Volume	Volume Units
06/26/2015	Bakken	11125	20460	50	192526	Barrels

Type Treatment	Acid %	Lbs Proppant	Maximum Treatment Pressure (PSI)	Maximum Treatment Rate (BBLS/Min)
Sand Frac		9254340	8844	39.0

Details
100 Mesh: 229320
40/70 White: 1221920
20/40 White: 6435200
20/40 Resin Coated: 1367900

Date Stimulated	Stimulated Formation	Top (Ft)	Bottom (Ft)	Stimulation Stages	Volume	Volume Units

Type Treatment	Acid %	Lbs Proppant	Maximum Treatment Pressure (PSI)	Maximum Treatment Rate (BBLS/Min)

Details

Date Stimulated	Stimulated Formation	Top (Ft)	Bottom (Ft)	Stimulation Stages	Volume	Volume Units

Type Treatment	Acid %	Lbs Proppant	Maximum Treatment Pressure (PSI)	Maximum Treatment Rate (BBLS/Min)

Details

Date Stimulated	Stimulated Formation	Top (Ft)	Bottom (Ft)	Stimulation Stages	Volume	Volume Units

Type Treatment	Acid %	Lbs Proppant	Maximum Treatment Pressure (PSI)	Maximum Treatment Rate (BBLS/Min)

Details

Date Stimulated	Stimulated Formation	Top (Ft)	Bottom (Ft)	Stimulation Stages	Volume	Volume Units

Type Treatment	Acid %	Lbs Proppant	Maximum Treatment Pressure (PSI)	Maximum Treatment Rate (BBLS/Min)

Details

ADDITIONAL INFORMATION AND/OR LIST OF ATTACHMENTS

I hereby swear or affirm that the information provided is true, complete and correct as determined from all available records.	Email Address	Date
	jswenson@oasispetroleum.com	10/05/2015
Signature	Printed Name	Title
	Jennifer Swenson	Regulatory Specialist

TH

AUTHORIZATION TO PURCHASE AND TRANSPORT OIL FROM LEASE – Form 8

INDUSTRIAL COMMISSION OF NORTH DAKOTA
OIL AND GAS DIVISION
600 EAST BOULEVARD DEPT 405
BISMARCK, ND 58505-0840
SFN 5698 (03-2000)

SEP 2015 RECEIVED ND OIL & GAS DIVISION

Well File No.
28652
NDIC CTB No.
To be assigned

128652

PLEASE READ INSTRUCTIONS BEFORE FILLING OUT FORM.
PLEASE SUBMIT THE ORIGINAL AND FOUR COPIES.

Well Name and Number	Qtr-Qtr	Section	Township	Range	County
KLINE FEDERAL 5300 41-18 10B	LOT4	18	153	100	Mckenzie

Operator	Telephone Number	Field
Oasis Petroleum North America LLC	(281) 404-9573	BAKER

Address	City	State	Zip Code
1001 Fannin, Suite 1500	Houston	TX	77002

Name of First Purchaser	Telephone Number	% Purchased	Date Effective
Oasis Petroleum Marketing LLC	(281) 404-9627	100%	September 1, 2015

Principal Place of Business	City	State	Zip Code
1001 Fannin, Suite 1500	Houston	TX	77002

Field Address	City	State	Zip Code

Transporter	Telephone Number	% Transported	Date Effective
Hiland Crude, LLC	(580) 616-2058	75%	September 1, 2015

Address	City	State	Zip Code
P.O. Box 3886	Enid	OK	73702

The above named producer authorizes the above named purchaser to purchase the percentage of oil stated above which is produced from the lease designated above until further notice. The oil will be transported by the above named transporter.

Other First Purchasers Purchasing From This Lease	% Purchased	Date Effective
Other First Purchasers Purchasing From This Lease	% Purchased	Date Effective
Other Transporters Transporting From This Lease	% Transported	Date Effective
Power Crude Transport	25%	September 1, 2015
Other Transporters Transporting From This Lease	% Transported	Date Effective
		September 1, 2015

Comments

I hereby swear or affirm that the information provided is true, complete and correct as determined from all available records.		Date
Signature	Printed Name	Title
	Dina Barron	Mktg. Contracts Administrator

Above Signature Witnessed By:

Signature	Printed Name	Title
	Jeremy Harris	Marketing Scheduler

FOR STATE USE ONLY

Date Approved	SEP 18 2015
By	Evie Roberson
Title	Oil & Gas Production Analyst

Industrial Commission of North Dakota
Oil and Gas Division
Verbal Approval To Purchase and Transport Oil

Well or Facility No **28652**

Tight Hole **Yes**

OPERATOR

Operator	Representative	Rep Phone
OASIS PETROLEUM NORTH AMERICA LL	**Todd Hanson**	**(701) 577-1632**

WELL INFORMATION

Well Name
KLINE FEDERAL 5300 41-18 10B

Inspector
Richard Dunn

Well Location	QQ	Sec	Twp		Rng	
	LOT4	**18**	**153**	**N**	**100**	**W**

County
MCKENZIE

Field
BAKER

Footages
500 Feet From the **S** Line
237 Feet From the **W** Line

Pool
BAKKEN

Date of First Production Through Permanent Wellhead **This Is Not The First Sales**

PURCHASER / TRANSPORTER

Purchaser	Transporter
Kinder Morgan	**Kinder Morgan**

TANK BATTERY

Single Well Tank Battery Number :

SALES INFORMATION **This Is Not The First Sales**

ESTIMATED BARRELS TO BE SOLD	ACTUAL BARRELS SOLD	DATE
15000 BBLS	BBLS	
BBLS	BBLS	
BBLS	BBLS	
BBLS	BBLS	
BBLS	BBLS	
BBLS	BBLS	
BBLS	BBLS	
BBLS	BBLS	
BBLS	BBLS	

DETAILS

Must E-Mail or Call Inspector at 701-770-3554/rsdunn@nd.gov on first date of sales and report amount sold, date sold, and first date of production through the permanent wellhead. Must also forward Forms 6 & 8 to State prior to reaching 15000 Bbl estimate or no later than required time frame for submitting those forms.

Start Date	**8/25/2015**
Date Approved	**8/25/2015**
Approved By	**Richard Dunn**

WELL COMPLETION OR RECOMPLETION REPORT - FORM 6

INDUSTRIAL COMMISSION OF NORTH DAKOTA
OIL AND GAS DIVISION
600 EAST BOULEVARD DEPT 405
BISMARCK, ND 58505-0840
SFN 2468 (04-2010)

JUL 2015 RECEIVED ND OIL & GAS DIVISION

Well File No. **28652**

PLEASE READ INSTRUCTIONS BEFORE FILLING OUT FORM.
PLEASE SUBMIT THE ORIGINAL AND ONE COPY.

Designate Type of Completion
☑ Oil Well ☐ EOR Well ☐ Recompletion ☐ Deepened Well ☐ Added Horizontal Leg ☐ Extended Horizontal Leg
☐ Gas Well ☐ SWD Well ☐ Water Supply Well ☐ Other:

Well Name and Number **Kline Federal 5300 41-18 10B**			Spacing Unit Description **Sec. 17/18 T153N R100W**
Operator **Oasis Petroleum North America**		Telephone Number **(281) 404-9591**	Field **Baker**
Address **1001 Fannin, Suite 1500**			Pool **Bakken**
City **Houston**	State **TX**	Zip Code **77002**	Permit Type ☐ Wildcat ☑ Development ☐ Extension

LOCATION OF WELL

At Surface	Qtr-Qtr	Section	Township	Range	County
500 F **S** L **237** F **W** L	**SWSW**	**18**	**153 N**	**100 W**	**McKenzie**

Spud Date	Date TD Reached	Drilling Contractor and Rig Number	KB Elevation (Ft)	Graded Elevation (Ft)
September 8, 2014	**January 1, 2015**	**Nabors 486**	**2082**	**2057**

Type of Electric and Other Logs Run (See Instructions)
MWD/GR FROM KOP TO TD; CBL FROM INT. TD TO SURFACE

CASING & TUBULARS RECORD (Report all strings set in well)

Well Bore	String Type	String Size (Inch)	Top Set (MD Ft)	Depth Set (MD Ft)	Hole Size (Inch)	Weight (Lbs/Ft)	Anchor Set (MD Ft)	Packer Set (MD Ft)	Sacks Cement	Top of Cement
Surface Hole	**Surface**	**13 3/8**	**0**	**2125**	**17 1/2**	**54.5**			**950**	**0**
Vertical Hole	**Intermediate**	**9 5/8**	**0**	**6125**	**13 1/2**	**36**			**1204**	**2400**
Vertical Hole	**Intermediate**	**7**	**0**	**11125**	**8 3/4**	**32**			**842**	
Lateral1	**Liner**	**4 1/2**	**10190**	**20460**	**6**	**13.5**			**510**	**10190**

PERFORATION & OPEN HOLE INTERVALS

Well Bore	Well Bore TD Drillers Depth (MD Ft)	Completion Type	Open Hole/Perforated Interval (MD,Ft) Top	Bottom	Kick-off Point (MD Ft)	Top of Casing Window (MD Ft)	Date Perf'd or Drilled	Date Isolated	Isolation Method	Sacks Cement
Lateral1	**20475**	**Perforations**			**10240**					

PRODUCTION

Current Producing Open Hole or Perforated Interval(s), This Completion, Top and Bottom, (MD Ft) **Lateral 1-**							Name of Zone (If Different from Pool Name)
Date Well Completed (SEE INSTRUCTIONS)			Producing Method	Pumping-Size & Type of Pump			Well Status (Producing or Shut-In)
Date of Test	Hours Tested	Choke Size **/64**	Production for Test	Oil (Bbls)	Gas (MCF)	Water (Bbls)	Oil Gravity-API (Corr.) °	Disposition of Gas
Flowing Tubing Pressure (PSI)	Flowing Casing Pressure (PSI)		Calculated 24-Hour Rate	Oil (Bbls)	Gas (MCF)	Water (Bbls)	Gas-Oil Ratio

GEOLOGICAL MARKERS

Formation	MD (Ft)	TVD (Ft)
Dakota	5471	5471
Kibbey Lime	8376	8376
First Charles Salt	8566	8566
UB		
Base Last Salt	9206	9206
Ratcliffe		
Mission Canyon	9428	9428
Lodgepole	9980	9980
False Bakken	10864	10706
Scallion		
Upper Bakken	10890	10715
Middle Bakken	10954	10733
Target		

PLUG BACK INFORMATION

Well Bore	Type of Plug	Top (Ft)	Bottom (Ft)	Sacks Cement

CORES CUT

Top (Ft)	Bottom (Ft)	Formation	Top (Ft)	Bottom (Ft)	Formation

Drill Stem Test

Test Date	Formation	Top (Ft)	Bottom (Ft)	BH Temp (°F)	CL ppm	H2S ppm	Shut-in 1 (PSIG)	Shut-in 2 (PSIG)
Drill Pipe Recovery								
Sample Chamber Recovery								
Test Date	Formation	Top (Ft)	Bottom (Ft)	BH Temp (°F)	CL ppm	H2S ppm	Shut-in 1 (PSIG)	Shut-in 2 (PSIG)
Drill Pipe Recovery								
Sample Chamber Recovery								
Test Date	Formation	Top (Ft)	Bottom (Ft)	BH Temp (°F)	CL ppm	H2S ppm	Shut-in 1 (PSIG)	Shut-in 2 (PSIG)
Drill Pipe Recovery								
Sample Chamber Recovery								
Test Date	Formation	Top (Ft)	Bottom (Ft)	BH Temp (°F)	CL ppm	H2S ppm	Shut-in 1 (PSIG)	Shut-in 2 (PSIG)
Drill Pipe Recovery								
Sample Chamber Recovery								
Test Date	Formation	Top (Ft)	Bottom (Ft)	BH Temp (°F)	CL ppm	H2S ppm	Shut-in 1 (PSIG)	Shut-in 2 (PSIG)
Drill Pipe Recovery								
Sample Chamber Recovery								

Well Specific Stimulations

Date Stimulated	Stimulated Formation	Top (Ft)	Bottom (Ft)	Stimulation Stages	Volume	Volume Units **Barrels**
Type Treatment **Sand Frac**	Acid %	Lbs Proppant	Maximum Treatment Pressure (PSI)	Maximum Treatment Rate (BBLS/Min)		
Details						

Date Stimulated	Stimulated Formation	Top (Ft)	Bottom (Ft)	Stimulation Stages	Volume	Volume Units
Type Treatment	Acid %	Lbs Proppant	Maximum Treatment Pressure (PSI)	Maximum Treatment Rate (BBLS/Min)		
Details						

Date Stimulated	Stimulated Formation	Top (Ft)	Bottom (Ft)	Stimulation Stages	Volume	Volume Units
Type Treatment	Acid %	Lbs Proppant	Maximum Treatment Pressure (PSI)	Maximum Treatment Rate (BBLS/Min)		
Details						

Date Stimulated	Stimulated Formation	Top (Ft)	Bottom (Ft)	Stimulation Stages	Volume	Volume Units
Type Treatment	Acid %	Lbs Proppant	Maximum Treatment Pressure (PSI)	Maximum Treatment Rate (BBLS/Min)		
Details						

Date Stimulated	Stimulated Formation	Top (Ft)	Bottom (Ft)	Stimulation Stages	Volume	Volume Units
Type Treatment	Acid %	Lbs Proppant	Maximum Treatment Pressure (PSI)	Maximum Treatment Rate (BBLS/Min)		
Details						

ADDITIONAL INFORMATION AND/OR LIST OF ATTACHMENTS

This is a preliminary completion report. A supplemental report will be filed upon first production of the well.

I hereby swear or affirm that the information provided is true, complete and correct as determined from all available records.	Email Address **jswenson@oasispetroleum.com**	Date **07/21/2015**
Signature	Printed Name **Jennifer Swenson**	Title **Regulatory Specialist**

SUNDRY NOTICES AND REPORTS ON WELLS - FORM 4

INDUSTRIAL COMMISSION OF NORTH DAKOTA
OIL AND GAS DIVISION
600 EAST BOULEVARD DEPT 405
BISMARCK, ND 58505-0840
SFN 5749 (09-2006)

RECEIVED JUN 30 2015 ND OIL & GAS DIVISION

Well File No. 28652

PLEASE READ INSTRUCTIONS BEFORE FILLING OUT FORM.
PLEASE SUBMIT THE ORIGINAL AND ONE COPY.

☑ Notice of Intent	Approximate Start Date: June 30, 2015	☐ Drilling Prognosis	☐ Spill Report
☐ Report of Work Done	Date Work Completed:	☐ Redrilling or Repair	☐ Shooting
☐ Notice of Intent to Begin a Workover Project that may Qualify for a Tax Exemption Pursuant to NDCC Section 57-51.1-03.	Approximate Start Date:	☐ Casing or Liner	☐ Acidizing
		☐ Plug Well	☐ Fracture Treatment
		☐ Supplemental History	☐ Change Production Method
		☐ Temporarily Abandon	☐ Reclamation
		☑ Other	Change well status to CONFIDENTIAL

Well Name and Number				
Kline Federal 5300 41-18 10B				
Footages: 500 F S L 237 F W L	Qtr-Qtr: LOT 4	Section: 18	Township: 153 N	Range: 100 W
Field: Baker	Pool: Bakken	County: McKenzie		

24-HOUR PRODUCTION RATE

Before		After	
Oil	Bbls	Oil	Bbls
Water	Bbls	Water	Bbls
Gas	MCF	Gas	MCF

Name of Contractor(s)			
Address	City	State	Zip Code

DETAILS OF WORK

Effective immediately, we request CONFIDENTIAL STATUS for the above referenced well.

This well has not been completed

OFF CONFIDENTIAL 12/30/15.

Company: Oasis Petroleum North America LLC		Telephone Number: 281-404-9436
Address: 1001 Fannin, Suite 1500		
City: Houston	State: TX	Zip Code: 77002
Signature:	Printed Name: Jennifer Swenson	
Title: Regulatory Specialist	Date: June 30, 2015	
Email Address: jswenson@oasispetroleum.com		

FOR STATE USE ONLY

☐ Received	☒ Approved
Date: 7/07/15	
By: Alice D. Webber	
Title: Engineering Technician	

Gyrodata Incorporated
301 Thelma Dr. #413
Casper, Wyoming 82601

307-472-0182
Fax: 307-472-0204

DIRECTIONAL SURVEY CERTIFICATION

RE: Oasis Petroleum (Operator)

Kline Federal 5300 41-18 10B (Well Name & No.)

8.19 (Magnetic Declination)

Surveyor: Blake Hunter

I, Kristopher Bertsch ,having personal knowledge of all the facts, hereby certify that the attached directional survey run from measured depth of 138 feet to a measured depth of 15212 feet and is projected to 15303 feet, is true and correct as determined from all available records.

Signature	Title	Company
	MWD Coordinator	Gyrodata, Inc.

*All measurements recorded with a manned MWD Survey Tool.

A Gyrodata Directional Survey

FINAL DEFINITIVE COPY

for

OASIS PETROLEUM

Lease: Kline Federal Well: 5300 41-18 10B, 8 3/4" Case, 6" Hole

Location: Nabors #486, McKenzie County, North Dakota

Job Number: RD0814M177

Run Date: 05 Mar 2015

Surveyor: Blake Hunter

Calculation Method: MINIMUM CURVATURE

Survey Latitude: 48.068944 deg. N Longitude: 103.603319 deg. W

Magnetic Declination: 8.1900 deg

Total Correction: 8.1900 deg

Proposed Well Direction: 90.000 deg

Depth Reference: Rotary Table

Air Gap (RKB to Ground / RKB to MSL): 25.00

Ground Elevation (Ground to MSL / MSL to Mudline): 2057.00

Vertical Section Calculated from Well Head Location

Closure Calculated from Well Head Location

Horizontal Coordinates Calculated from Well Head Location

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MEASURED DEPTH feet	INCL deg.	AZIMUTH deg.	DOGLEG SEVERITY deg./ 100 ft.	VERTICAL DEPTH feet	CLOSURE DIST. feet	CLOSURE AZIMUTH deg.	HORIZONTAL COORDINATES feet	
0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.00 N	0.00 E

NO TIE-IN DATA PROVIDED. TIE-IN TO SURFACE.
ALL AZIMUTHS ARE REFERENCED TO TRUE NORTH.
ALL MEASURED DEPTHS AND COORDINATES REFERENCED TO NABORS 486 R.K.B. OF 25 FT.
138-15212 FT. MAGNETIC MEASUREMENT WHILE DRILLING SURVEY.
STRAIGHT LINE PROJECTION TO BIT DEPTH AT 15303 FT. MD.

138.00	0.40	84.47	0.29	138.00	0.5	84.5	0.05 N	0.48 E
232.00	0.48	53.62	0.26	232.00	1.2	74.5	0.31 N	1.12 E
325.00	0.31	52.74	0.18	324.99	1.8	67.0	0.69 N	1.64 E
419.00	0.44	72.69	0.19	418.99	2.4	66.4	0.96 N	2.18 E
515.00	0.75	86.58	0.35	514.99	3.3	70.8	1.10 N	3.16 E
605.00	0.35	60.13	0.52	604.98	4.2	72.3	1.28 N	3.99 E
697.00	0.66	103.54	0.51	696.98	4.9	74.8	1.29 N	4.75 E
789.00	0.40	66.54	0.45	788.98	5.7	76.9	1.30 N	5.56 E
881.00	0.31	49.84	0.15	880.97	6.2	75.3	1.58 N	6.04 E
973.00	0.66	95.90	0.54	972.97	7.0	76.0	1.69 N	6.76 E
1064.00	0.35	33.32	0.65	1063.97	7.7	75.9	1.87 N	7.43 E
1156.00	0.22	349.64	0.27	1155.97	7.9	73.2	2.28 N	7.56 E
1248.00	0.48	246.89	0.62	1247.97	7.5	72.2	2.30 N	7.17 E
1340.00	0.35	249.53	0.14	1339.96	6.9	72.6	2.05 N	6.55 E

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1431.00	0.48	266.67	0.20	1430.96	6.2	71.9	1.93 N	5.91 E
1526.00	0.35	253.84	0.17	1525.96	5.5	70.8	1.83 N	5.24 E
1622.00	0.62	267.55	0.30	1621.95	4.8	68.8	1.72 N	4.44 E
1717.00	0.31	285.92	0.36	1716.95	4.1	64.3	1.77 N	3.67 E
1811.00	0.62	316.77	0.41	1810.95	3.8	54.3	2.21 N	3.08 E
1907.00	0.75	339.53	0.31	1906.94	4.0	38.3	3.18 N	2.51 E
2002.00	0.22	357.72	0.57	2001.94	4.6	30.1	3.94 N	2.28 E
2071.00	0.57	351.48	0.51	2070.94	4.9	26.8	4.41 N	2.23 E
2190.00	0.62	355.20	0.05	2189.93	6.0	20.3	5.64 N	2.08 E
2284.00	0.44	349.84	0.20	2283.93	6.8	16.9	6.50 N	1.98 E
2379.00	0.48	156.39	0.96	2378.92	6.8	17.7	6.50 N	2.07 E
2472.00	0.66	145.67	0.22	2471.92	6.2	23.9	5.70 N	2.53 E
2567.00	0.57	153.23	0.13	2566.91	5.7	32.3	4.83 N	3.05 E
2662.00	0.48	157.01	0.10	2661.91	5.3	40.3	4.04 N	3.42 E
2757.00	0.31	194.10	0.31	2756.91	4.9	45.8	3.42 N	3.51 E
2852.00	0.31	178.19	0.09	2851.91	4.5	49.9	2.92 N	3.46 E
2945.00	0.35	191.02	0.09	2944.91	4.2	55.0	2.39 N	3.41 E
3039.00	0.44	92.58	0.64	3038.90	4.3	60.7	2.09 N	3.72 E
3134.00	0.31	108.76	0.18	3133.90	4.8	65.3	1.99 N	4.33 E
3227.00	0.40	101.02	0.11	3226.90	5.2	69.3	1.85 N	4.88 E
3322.00	0.57	135.04	0.34	3321.90	5.7	75.4	1.45 N	5.54 E
3417.00	0.88	92.67	0.63	3416.89	6.7	80.7	1.08 N	6.60 E

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MEASURED DEPTH feet	INCL deg.	AZIMUTH deg.	DOGLEG SEVERITY deg./ 100 ft.	VERTICAL DEPTH feet	CLOSURE DIST. feet	CLOSURE AZIMUTH deg.	HORIZONTAL COORDINATES feet	
3512.00	0.79	88.19	0.12	3511.88	8.1	82.4	1.07 N	7.99 E
3606.00	0.75	83.88	0.07	3605.87	9.3	82.9	1.15 N	9.25 E
3701.00	0.70	103.92	0.27	3700.86	10.5	84.1	1.08 N	10.43 E
3796.00	0.57	82.48	0.28	3795.86	11.5	85.0	1.00 N	11.46 E
3890.00	0.62	78.00	0.07	3889.85	12.5	84.6	1.17 N	12.42 E
3984.00	0.57	104.98	0.30	3983.85	13.4	85.1	1.15 N	13.37 E
4079.00	0.35	92.85	0.25	4078.84	14.2	85.9	1.02 N	14.12 E
4171.00	0.22	101.55	0.15	4170.84	14.6	86.2	0.97 N	14.57 E
4266.00	0.31	66.31	0.19	4265.84	15.0	86.1	1.03 N	14.98 E
4361.00	0.22	39.94	0.16	4360.84	15.4	85.2	1.28 N	15.34 E
4456.00	0.31	70.00	0.17	4455.84	15.8	84.5	1.50 N	15.70 E
4550.00	0.26	70.44	0.05	4549.84	16.2	84.1	1.66 N	16.14 E
4645.00	0.13	52.86	0.15	4644.84	16.5	83.7	1.80 N	16.42 E
4740.00	0.31	355.29	0.28	4739.84	16.6	82.7	2.12 N	16.49 E
4835.00	0.31	355.64	0.00	4834.84	16.7	80.9	2.63 N	16.45 E
4931.00	0.70	37.21	0.53	4930.83	17.1	78.7	3.36 N	16.78 E
5024.00	0.66	34.93	0.05	5023.83	17.9	76.3	4.25 N	17.43 E
5119.00	0.70	34.23	0.04	5118.82	18.8	74.0	5.18 N	18.07 E
5214.00	0.66	35.81	0.05	5213.81	19.7	71.9	6.10 N	18.72 E
5308.00	0.48	68.42	0.39	5307.81	20.5	71.0	6.69 N	19.40 E
5403.00	0.35	40.91	0.25	5402.81	21.2	70.5	7.05 N	19.96 E
5497.00	0.53	29.92	0.21	5496.80	21.8	69.4	7.65 N	20.37 E

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MEASURED DEPTH feet	INCL deg.	AZIMUTH deg.	DOGLEG SEVERITY deg./ 100 ft.	VERTICAL DEPTH feet	CLOSURE DIST. feet	CLOSURE AZIMUTH deg.	HORIZONTAL COORDINATES feet	
5592.00	0.31	32.64	0.23	5591.80	22.3	68.3	8.24 N	20.73 E
5687.00	0.31	351.60	0.23	5686.80	22.6	67.3	8.71 N	20.83 E
5782.00	0.18	358.89	0.14	5781.80	22.7	66.3	9.12 N	20.79 E
5876.00	0.18	40.29	0.14	5875.80	22.9	65.8	9.38 N	20.88 E
5971.00	0.35	353.44	0.28	5970.80	23.1	65.0	9.78 N	20.94 E
6066.00	0.40	27.99	0.24	6065.80	23.5	63.8	10.36 N	21.07 E
6090.00	0.35	27.37	0.21	6089.80	23.6	63.6	10.50 N	21.14 E
6159.00	0.44	24.29	0.13	6158.79	24.0	62.9	10.93 N	21.34 E
6253.00	0.79	16.74	0.38	6252.79	24.7	61.3	11.88 N	21.68 E
6348.00	0.84	21.48	0.09	6347.78	25.7	59.3	13.15 N	22.12 E
6443.00	1.05	60.59	0.70	6442.77	27.2	58.4	14.23 N	23.14 E
6537.00	1.05	27.46	0.64	6536.75	28.8	57.6	15.42 N	24.28 E
6632.00	0.48	29.66	0.60	6631.74	29.9	56.4	16.53 N	24.88 E
6725.00	0.48	47.50	0.16	6724.74	30.6	56.0	17.14 N	25.36 E
6821.00	0.40	177.75	0.83	6820.74	30.8	56.4	17.07 N	25.67 E
6914.00	0.35	235.32	0.39	6913.74	30.4	56.9	16.59 N	25.45 E
7010.00	0.31	94.34	0.65	7009.74	30.3	57.2	16.40 N	25.47 E
7103.00	0.22	165.53	0.34	7102.73	30.4	57.8	16.21 N	25.76 E
7197.00	0.48	194.98	0.33	7196.73	30.1	58.7	15.65 N	25.71 E
7292.00	0.48	172.13	0.20	7291.73	29.7	59.9	14.87 N	25.66 E
7386.00	0.31	205.96	0.30	7385.73	29.3	60.9	14.26 N	25.60 E

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7480.00	0.13	185.84	0.21	7479.73	29.0	61.3	13.92 N	25.48 E
7575.00	0.31	163.69	0.21	7574.73	28.9	62.0	13.57 N	25.54 E
7669.00	0.31	182.67	0.11	7668.72	28.7	63.0	13.07 N	25.60 E
7764.00	0.35	214.75	0.20	7763.72	28.4	63.7	12.57 N	25.42 E
7856.00	0.31	194.36	0.13	7855.72	28.0	64.3	12.10 N	25.20 E
7951.00	0.35	136.00	0.34	7950.72	27.9	65.3	11.64 N	25.34 E
8045.00	0.44	157.10	0.18	8044.72	28.0	66.6	11.11 N	25.68 E
8139.00	0.44	132.40	0.20	8138.72	28.1	68.0	10.53 N	26.09 E
8234.00	0.26	132.58	0.19	8233.71	28.4	69.1	10.14 N	26.51 E
8328.00	0.26	109.20	0.11	8327.71	28.6	69.7	9.92 N	26.87 E
8422.00	0.04	9.53	0.29	8421.71	28.8	69.9	9.89 N	27.08 E
8516.00	0.62	116.75	0.67	8515.71	29.2	70.6	9.69 N	27.54 E
8610.00	0.44	119.66	0.19	8609.71	29.8	71.8	9.28 N	28.31 E
8705.00	0.35	104.63	0.14	8704.70	30.3	72.7	9.03 N	28.90 E
8800.00	0.35	27.46	0.46	8799.70	30.7	72.6	9.21 N	29.32 E
8895.00	0.57	40.82	0.26	8894.70	31.3	71.7	9.83 N	29.76 E
8988.00	0.62	46.09	0.08	8987.70	32.2	70.9	10.53 N	30.43 E
9082.00	0.66	42.58	0.06	9081.69	33.1	70.1	11.28 N	31.16 E
9177.00	0.70	37.39	0.08	9176.68	34.1	69.2	12.14 N	31.88 E
9270.00	0.75	28.78	0.13	9269.68	35.1	68.0	13.13 N	32.52 E
9365.00	0.66	47.85	0.26	9364.67	36.1	67.1	14.04 N	33.22 E
9460.00	0.57	64.28	0.21	9459.66	37.1	66.8	14.61 N	34.06 E

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MEASURED DEPTH feet	INCL deg.	AZIMUTH deg.	DOGLEG SEVERITY deg./ 100 ft.	VERTICAL DEPTH feet	CLOSURE DIST. feet	CLOSURE AZIMUTH deg.	HORIZONTAL COORDINATES feet	
9553.00	0.57	51.54	0.14	9552.66	38.0	66.6	15.10 N	34.83 E
9647.00	0.79	90.48	0.53	9646.65	39.0	66.8	15.38 N	35.85 E
9741.00	0.79	111.31	0.30	9740.64	40.1	67.8	15.14 N	37.10 E
9834.00	0.88	116.67	0.13	9833.63	41.0	69.2	14.59 N	38.34 E
9931.00	1.05	100.23	0.33	9930.62	42.3	70.5	14.10 N	39.88 E
10025.00	0.84	76.59	0.47	10024.61	43.7	71.2	14.10 N	41.39 E
10120.00	0.75	56.64	0.30	10119.60	45.0	71.1	14.61 N	42.59 E
10187.00	0.66	66.22	0.22	10186.59	45.8	70.9	15.00 N	43.31 E
10217.00	0.44	40.99	1.07	10216.59	46.1	70.8	15.16 N	43.54 E
10248.00	2.68	70.70	7.45	10247.58	46.9	70.7	15.49 N	44.31 E
10279.00	7.78	74.22	16.48	10278.44	49.8	70.9	16.30 N	47.01 E
10311.00	13.05	74.83	16.47	10309.90	55.5	71.3	17.84 N	52.59 E
10343.00	18.46	74.57	16.91	10340.69	64.2	71.7	20.13 N	60.96 E
10375.00	20.40	71.84	6.69	10370.86	74.8	71.9	23.22 N	71.15 E
10406.00	22.11	70.88	5.63	10399.75	86.1	71.8	26.81 N	81.79 E
10438.00	24.53	70.79	7.56	10429.14	98.7	71.7	30.97 N	93.76 E
10470.00	25.93	73.60	5.76	10458.09	112.4	71.8	35.13 N	106.74 E
10502.00	30.11	78.00	14.56	10486.33	127.4	72.3	38.78 N	121.32 E
10533.00	33.54	79.67	11.42	10512.67	143.6	73.0	41.93 N	137.35 E
10565.00	37.14	79.40	11.26	10538.77	162.0	73.8	45.30 N	155.55 E
10597.00	41.14	75.09	15.11	10563.59	182.2	74.1	49.78 N	175.23 E
10628.00	45.36	73.69	13.96	10586.16	203.4	74.2	55.51 N	195.68 E

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10660.00	49.85	71.84	14.67	10607.73	227.0	74.0	62.52 N	218.24 E
10691.00	53.49	73.69	12.64	10626.96	251.3	73.9	69.72 N	241.46 E
10723.00	57.10	76.06	12.82	10645.17	277.6	74.0	76.57 N	266.85 E
10754.00	60.40	77.82	11.70	10661.25	304.1	74.2	82.55 N	292.67 E
10785.00	64.04	77.73	11.74	10675.70	331.5	74.5	88.35 N	319.47 E
10816.00	67.91	77.91	12.50	10688.32	359.7	74.8	94.33 N	347.14 E
10848.00	68.31	78.52	2.17	10700.25	389.4	75.1	100.39 N	376.20 E
10879.00	68.35	78.08	1.33	10711.70	418.1	75.3	106.23 N	404.41 E
10910.00	71.74	76.76	11.64	10722.28	447.2	75.4	112.58 N	432.85 E
10942.00	77.23	76.41	17.19	10730.83	478.1	75.5	119.73 N	462.83 E
10973.00	81.05	75.62	12.57	10736.67	508.5	75.5	127.09 N	492.37 E
11005.00	81.49	73.60	6.39	10741.53	540.1	75.5	135.48 N	522.86 E
11036.00	81.54	73.69	0.33	10746.10	570.8	75.4	144.12 N	552.28 E
11068.00	85.01	73.07	11.01	10749.85	602.5	75.3	153.21 N	582.73 E
11078.00	86.42	73.25	14.21	10750.60	612.5	75.2	156.10 N	592.27 E
11098.00	88.09	71.84	10.92	10751.55	632.4	75.2	162.09 N	611.33 E
11166.00	88.70	71.38	1.12	10753.46	700.3	74.8	183.53 N	675.83 E
11197.00	89.05	71.21	1.26	10754.07	731.2	74.7	193.47 N	705.18 E
11229.00	89.71	70.68	2.65	10754.41	763.2	74.5	203.92 N	735.43 E
11260.00	90.59	71.91	4.88	10754.33	794.1	74.4	213.86 N	764.79 E
11291.00	91.30	73.84	6.63	10753.82	825.1	74.3	222.99 N	794.41 E

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11322.00	91.96	75.07	4.50	10752.94	856.1	74.3	231.29 N	824.26 E
11353.00	92.70	76.39	4.88	10751.68	887.1	74.4	238.93 N	854.28 E
11384.00	92.88	78.50	6.82	10750.17	918.0	74.5	245.66 N	884.50 E
11415.00	92.88	79.38	2.84	10748.61	948.9	74.6	251.59 N	914.89 E
11446.00	92.35	80.88	5.13	10747.20	979.7	74.8	256.90 N	945.40 E
11477.00	92.09	82.72	5.99	10746.00	1010.4	75.0	261.32 N	976.06 E
11508.00	92.18	84.39	5.39	10744.84	1041.1	75.3	264.80 N	1006.84 E
11539.00	91.12	86.06	6.38	10743.95	1071.6	75.6	267.38 N	1037.72 E
11570.00	89.63	86.32	4.88	10743.75	1102.1	75.8	269.44 N	1068.65 E
11602.00	88.53	86.76	3.70	10744.26	1133.5	76.1	271.37 N	1100.58 E
11633.00	89.36	87.03	2.82	10744.83	1164.0	76.4	273.05 N	1131.53 E
11664.00	90.46	88.35	5.54	10744.88	1194.4	76.7	274.30 N	1162.50 E
11695.00	91.08	88.70	2.30	10744.46	1224.8	77.0	275.09 N	1193.49 E
11726.00	91.56	88.79	1.58	10743.75	1255.1	77.3	275.77 N	1224.48 E
11758.00	90.29	90.02	5.52	10743.23	1286.4	77.6	276.11 N	1256.47 E
11820.00	90.02	90.81	1.35	10743.07	1347.0	78.2	275.66 N	1318.47 E
11851.00	90.42	90.28	2.14	10742.95	1377.3	78.5	275.36 N	1349.46 E
11882.00	90.73	90.10	1.16	10742.64	1407.6	78.7	275.26 N	1380.46 E
11913.00	90.77	90.37	0.88	10742.23	1438.0	79.0	275.13 N	1411.46 E
11945.00	89.85	90.72	3.08	10742.06	1469.4	79.2	274.83 N	1443.46 E
12007.00	88.66	91.42	2.23	10742.86	1530.1	79.7	273.67 N	1505.44 E
12069.00	89.05	90.19	2.08	10744.10	1591.0	80.1	272.80 N	1567.42 E

A Gyrodata Directional Survey

Oasis Petroleum
Lease: Kline Federal Well: 5300 41-18 10B, 8 3/4" Case, 6" Hole
Location: Nabors #486, McKenzie County, North Dakota
Job Number: RD0814M177

MEASURED DEPTH feet	INCL deg.	AZIMUTH deg.	DOGLEG SEVERITY deg./ 100 ft.	VERTICAL DEPTH feet	CLOSURE DIST. feet	CLOSURE AZIMUTH deg.	HORIZONTAL COORDINATES feet	
12100.00	89.54	90.02	1.67	10744.48	1621.5	80.3	272.74 N	1598.42 E
12163.00	89.71	87.64	3.79	10744.90	1683.8	80.6	274.03 N	1661.40 E
12194.00	88.70	88.26	3.82	10745.33	1714.6	80.8	275.14 N	1692.37 E
12256.00	89.80	87.03	2.66	10746.14	1776.2	81.0	277.68 N	1754.32 E
12287.00	90.11	89.14	6.88	10746.16	1806.9	81.1	278.72 N	1785.30 E
12349.00	90.20	88.87	0.46	10745.99	1868.4	81.4	279.80 N	1847.29 E
12380.00	89.49	88.26	3.02	10746.08	1899.1	81.5	280.57 N	1878.28 E
12411.00	89.36	89.84	5.11	10746.39	1929.8	81.6	281.09 N	1909.27 E
12473.00	90.07	88.35	2.66	10746.70	1991.3	81.9	282.07 N	1971.26 E
12505.00	90.51	89.31	3.30	10746.53	2023.1	82.0	282.72 N	2003.25 E
12567.00	91.69	89.23	1.91	10745.34	2084.6	82.2	283.51 N	2065.23 E
12599.00	91.08	91.16	6.32	10744.57	2116.3	82.3	283.40 N	2097.22 E
12662.00	90.55	91.95	1.51	10743.68	2178.5	82.6	281.69 N	2160.19 E
12693.00	89.67	93.44	5.58	10743.62	2209.0	82.7	280.23 N	2191.16 E
12756.00	90.64	93.00	1.69	10743.45	2271.0	83.0	276.69 N	2254.06 E
12788.00	89.41	93.71	4.44	10743.43	2302.5	83.1	274.82 N	2286.00 E
12851.00	89.14	93.18	0.94	10744.23	2364.5	83.4	271.04 N	2348.88 E
12883.00	88.62	93.80	2.53	10744.85	2396.0	83.6	269.09 N	2380.82 E
12945.00	89.05	93.62	0.75	10746.11	2457.0	83.8	265.08 N	2442.67 E
13040.00	88.79	92.48	1.23	10747.91	2550.8	84.1	260.02 N	2537.52 E
13103.00	88.97	91.42	1.71	10749.14	2613.2	84.3	257.88 N	2600.47 E
13135.00	89.41	91.25	1.47	10749.59	2645.0	84.4	257.14 N	2632.46 E

A Gyrodata Directional Survey

Oasis Petroleum
Lease: Kline Federal Well: 5300 41-18 10B, 8 3/4" Case, 6" Hole
Location: Nabors #486, McKenzie County, North Dakota
Job Number: RD0814M177

MEASURED DEPTH feet	INCL deg.	AZIMUTH deg.	DOGLEG SEVERITY deg./ 100 ft.	VERTICAL DEPTH feet	CLOSURE DIST. feet	CLOSURE AZIMUTH deg.	HORIZONTAL COORDINATES feet	
13229.00	87.56	91.25	1.97	10752.07	2738.3	84.7	255.09 N	2726.40 E
13324.00	87.69	90.63	0.67	10756.01	2832.7	84.9	253.53 N	2821.30 E
13355.00	87.74	90.46	0.57	10757.25	2863.5	84.9	253.23 N	2852.28 E
13387.00	88.00	90.28	0.99	10758.44	2895.3	85.0	253.03 N	2884.26 E
13418.00	88.57	89.31	3.63	10759.36	2926.2	85.0	253.14 N	2915.24 E
13481.00	88.97	89.40	0.65	10760.72	2989.0	85.1	253.85 N	2978.22 E
13512.00	89.41	89.93	2.22	10761.15	3019.9	85.2	254.03 N	3009.22 E
13544.00	90.29	88.87	4.31	10761.24	3051.8	85.2	254.36 N	3041.22 E
13607.00	91.08	88.87	1.25	10760.49	3114.7	85.3	255.61 N	3104.20 E
13670.00	90.02	88.52	1.77	10759.88	3177.6	85.4	257.04 N	3167.18 E
13700.00	90.33	89.14	2.31	10759.79	3207.5	85.4	257.65 N	3197.17 E
13732.00	90.42	88.61	1.68	10759.58	3239.5	85.4	258.28 N	3229.16 E
13763.00	89.71	89.49	3.65	10759.54	3270.4	85.5	258.80 N	3260.16 E
13795.00	89.85	90.46	3.06	10759.67	3302.3	85.5	258.81 N	3292.16 E
13858.00	89.05	91.86	2.56	10760.27	3365.0	85.6	257.53 N	3355.14 E
13890.00	88.75	91.25	2.12	10760.89	3396.8	85.7	256.67 N	3387.12 E
13953.00	88.22	89.49	2.92	10762.55	3459.6	85.8	256.26 N	3450.10 E
13984.00	88.53	88.87	2.24	10763.43	3490.5	85.8	256.70 N	3481.08 E
14047.00	89.76	91.77	5.00	10764.37	3553.3	85.9	256.35 N	3544.07 E
14079.00	89.63	89.93	5.76	10764.54	3585.2	85.9	255.88 N	3576.06 E
14110.00	88.92	88.79	4.33	10764.93	3616.1	85.9	256.22 N	3607.05 E

A Gyrodata Directional Survey

Oasis Petroleum
Lease: Kline Federal Well: 5300 41-18 10B, 8 3/4" Case, 6" Hole
Location: Nabors #486, McKenzie County, North Dakota
Job Number: RD0814M177

MEASURED DEPTH feet	INCL deg.	AZIMUTH deg.	DOGLEG SEVERITY deg./ 100 ft.	VERTICAL DEPTH feet	CLOSURE DIST. feet	CLOSURE AZIMUTH deg.	HORIZONTAL COORDINATES feet	
14173.00	88.66	87.38	2.28	10766.26	3679.1	86.0	258.33 N	3670.00 E
14205.00	88.79	89.75	7.42	10766.98	3711.0	86.0	259.13 N	3701.98 E
14268.00	89.32	88.87	1.63	10768.02	3773.9	86.1	259.89 N	3764.97 E
14299.00	90.24	89.84	4.31	10768.13	3804.9	86.1	260.24 N	3795.97 E
14362.00	90.59	89.93	0.57	10767.68	3867.7	86.1	260.36 N	3858.97 E
14393.00	90.90	92.30	7.71	10767.28	3898.6	86.2	259.76 N	3889.95 E
14457.00	91.08	90.72	2.48	10766.17	3962.3	86.3	258.07 N	3953.92 E
14520.00	90.51	90.90	0.95	10765.30	4025.1	86.3	257.18 N	4016.91 E
14551.00	90.11	89.75	3.93	10765.13	4056.1	86.4	257.01 N	4047.91 E
14614.00	90.77	89.75	1.05	10764.64	4118.9	86.4	257.28 N	4110.90 E
14646.00	91.12	89.93	1.23	10764.12	4150.9	86.4	257.37 N	4142.90 E
14709.00	90.90	89.75	0.45	10763.01	4213.8	86.5	257.55 N	4205.89 E
14740.00	90.90	88.52	3.97	10762.52	4244.7	86.5	258.01 N	4236.88 E
14803.00	90.68	89.40	1.44	10761.65	4307.7	86.6	259.16 N	4299.86 E
14835.00	90.33	87.91	4.78	10761.37	4339.6	86.6	259.91 N	4331.85 E
14866.00	89.85	87.99	1.57	10761.32	4370.6	86.6	261.02 N	4362.83 E
14929.00	89.58	87.12	1.45	10761.63	4433.6	86.6	263.71 N	4425.77 E
14961.00	89.54	89.75	8.22	10761.88	4465.6	86.6	264.58 N	4457.76 E
15024.00	90.07	90.98	2.13	10762.09	4528.5	86.7	264.18 N	4520.76 E
15118.00	90.73	91.77	1.10	10761.44	4622.2	86.8	261.92 N	4614.72 E
15149.00	91.08	92.04	1.43	10760.95	4653.0	86.8	260.89 N	4645.70 E
15181.00	91.52	90.54	4.88	10760.22	4684.9	86.8	260.17 N	4677.69 E

A Gyrodata Directional Survey

Oasis Petroleum
Lease: Kline Federal Well: 5300 41-18 10B, 8 3/4" Case, 6" Hole
Location: Nabors #486, McKenzie County, North Dakota
Job Number: RD0814M177

MEASURED DEPTH feet	INCL deg.	AZIMUTH deg.	DOGLEG SEVERITY deg./ 100 ft.	VERTICAL DEPTH feet	CLOSURE DIST. feet	CLOSURE AZIMUTH deg.	HORIZONTAL COORDINATES feet	
15212.00	91.91	90.98	1.90	10759.29	4715.8	86.8	259.76 N	4708.67 E
STRAIGHT LINE PROJECTION TO BIT DEPTH AT 15303 FT. MD.								
15303.00	91.91	90.98	0.00	10756.26	4806.5	86.9	258.21 N	4799.61 E

Final Station Closure: Distance: 4806.55 ft Az: 86.92 deg.

Gyrodata Incorporated
301 Thelma Dr. #413
Casper, Wyoming 82601

307-472-0182
Fax: 307-472-0204

DIRECTIONAL SURVEY CERTIFICATION

RE: Oasis Petroleum (Operator)

Kline Federal 5300 41-18 10B ST1 (Well Name & No.)

8.19 (Magnetic Declination)

Surveyor: Blake Hunter

I, Kristopher Bertsch ,having personal knowledge of all the facts, hereby certify that the attached directional survey run from measured depth of 15024 feet to a measured depth of 18551 feet and is projected to 18629 feet, is true and correct as determined from all available records.

Signature	Title	Company
	MWD Coordinator	Gyrodata, Inc.

*All measurements recorded with a manned MWD Survey Tool.

A Gyrodata Directional Survey

FINAL DEFINITIVE COPY

for

OASIS PETROLEUM

Lease: Kline Federal Well: 5300 41-18 10B ST1, 6" Hole

Location: Nabors #486, McKenzie County, North Dakota

Job Number: RD0814M177ST1

Run Date: 26 Feb 2015

Surveyor: Blake Hunter

Calculation Method: MINIMUM CURVATURE

Survey Latitude: 48.068944 deg. N Longitude: 103.603319 deg. W

Magnetic Declination: 8.1900 deg

Total Correction: 8.1900 deg

Proposed Well Direction: 90.000 deg

Depth Reference: Rotary Table

Air Gap (RKB to Ground / RKB to MSL): 25.00

Ground Elevation (Ground to MSL / MSL to Mudline): 2057.00

Vertical Section Calculated from Well Head Location

Closure Calculated from Well Head Location

Horizontal Coordinates Calculated from Well Head Location

A Gyrodata Directional Survey

Oasis Petroleum
Lease: Kline Federal Well: 5300 41-18 10B ST1, 6" Hole
Location: Nabors #486, McKenzie County, North Dakota
Job Number: RD0814M177ST1

MEASURED DEPTH feet	INCL deg.	AZIMUTH deg.	DOGLEG SEVERITY deg./ 100 ft.	VERTICAL DEPTH feet	CLOSURE DIST. feet	CLOSURE AZIMUTH deg.	HORIZONTAL COORDINATES feet	
14961.00	89.54	89.75	0.00	10761.87	4465.6	86.6	264.58 N	4457.76 E

TIE-ON TO GYRODATA SURVEY OF ORIGINAL WELLBORE AT 14961 FT. MD.
ALL AZIMUTHS ARE REFERENCED TO TRUE NORTH.
ALL MEASURED DEPTHS AND COORDINATES REFERENCED TO NABORS 486 R.K.B. OF 25 FT.
15024-18551 MAGNETIC MEASUREMENT WHILE DRILLING SURVEY.
STRAIGHT LINE PROJECTION TO BIT DEPTH AT 18629 FT. MD.

15024.00	90.07	90.98	2.13	10762.08	4528.5	86.7	264.18 N	4520.76 E
15087.00	87.56	92.39	4.57	10763.39	4591.2	86.7	262.33 N	4583.71 E
15118.00	87.30	93.09	2.41	10764.78	4622.0	86.8	260.85 N	4614.64 E
15149.00	87.69	92.92	1.37	10766.13	4652.8	86.8	259.22 N	4645.57 E
15181.00	87.47	91.51	4.46	10767.48	4684.6	86.8	257.99 N	4677.52 E
15212.00	87.16	91.77	1.30	10768.94	4715.5	86.9	257.10 N	4708.47 E
15244.00	87.25	92.65	2.76	10770.50	4747.3	86.9	255.87 N	4740.41 E
15275.00	88.75	91.77	5.61	10771.58	4778.2	86.9	254.67 N	4771.37 E
15306.00	89.05	91.25	1.94	10772.17	4809.1	87.0	253.86 N	4802.35 E
15338.00	89.10	92.04	2.47	10772.69	4840.9	87.0	252.94 N	4834.33 E
15369.00	89.67	91.42	2.72	10773.02	4871.8	87.0	252.00 N	4865.31 E
15401.00	90.02	91.25	1.22	10773.11	4903.7	87.1	251.26 N	4897.31 E
15432.00	90.29	92.30	3.50	10773.03	4934.6	87.1	250.30 N	4928.29 E
15495.00	89.71	89.75	4.15	10773.03	4997.5	87.1	249.17 N	4991.27 E

A Gyrodata Directional Survey

Oasis Petroleum
Lease: Kline Federal Well: 5300 41-18 10B ST1, 6" Hole
Location: Nabors #486, McKenzie County, North Dakota
Job Number: RD0814M177ST1

MEASURED DEPTH feet	INCL deg.	AZIMUTH deg.	DOGLEG SEVERITY deg./ 100 ft.	VERTICAL DEPTH feet	CLOSURE DIST. feet	CLOSURE AZIMUTH deg.	HORIZONTAL COORDINATES feet	
15527.00	88.79	89.84	2.89	10773.44	5029.5	87.2	249.29 N	5023.27 E
15590.00	89.32	89.49	1.01	10774.48	5092.4	87.2	249.65 N	5086.26 E
15621.00	89.67	88.87	2.30	10774.76	5123.4	87.2	250.10 N	5117.26 E
15684.00	89.54	88.61	0.46	10775.19	5186.3	87.2	251.48 N	5180.24 E
15716.00	89.54	87.73	2.75	10775.45	5218.3	87.2	252.50 N	5212.22 E
15779.00	89.67	88.26	0.87	10775.88	5281.3	87.2	254.71 N	5275.18 E
15810.00	87.87	89.75	7.54	10776.55	5312.3	87.2	255.25 N	5306.17 E
15873.00	89.05	90.54	2.25	10778.24	5375.2	87.3	255.09 N	5369.14 E
15905.00	91.03	90.63	6.19	10778.22	5407.1	87.3	254.76 N	5401.14 E
15968.00	92.35	90.46	2.11	10776.36	5470.0	87.3	254.16 N	5464.11 E
16000.00	90.81	89.93	5.09	10775.48	5502.0	87.4	254.05 N	5496.10 E
16063.00	91.65	89.31	1.66	10774.13	5564.9	87.4	254.47 N	5559.08 E
16094.00	90.20	87.12	8.47	10773.62	5595.9	87.4	255.44 N	5590.06 E
16126.00	90.29	88.17	3.29	10773.49	5627.9	87.4	256.75 N	5622.03 E
16157.00	89.32	86.41	6.48	10773.59	5658.9	87.4	258.22 N	5652.99 E
16188.00	88.62	88.17	6.11	10774.15	5689.9	87.4	259.68 N	5683.95 E
16251.00	89.27	88.61	1.25	10775.31	5752.9	87.4	261.45 N	5746.92 E
16346.00	89.58	88.08	0.65	10776.26	5847.8	87.4	264.19 N	5841.87 E
16377.00	89.05	88.70	2.63	10776.63	5878.8	87.4	265.07 N	5872.86 E
16440.00	91.52	88.87	3.93	10776.32	5941.8	87.4	266.40 N	5935.84 E
16472.00	89.85	90.02	6.34	10775.94	5973.8	87.4	266.71 N	5967.83 E
16503.00	90.46	91.25	4.43	10775.86	6004.7	87.5	266.37 N	5998.83 E

A Gyrodata Directional Survey

Oasis Petroleum
Lease: Kline Federal Well: 5300 41-18 10B ST1, 6" Hole
Location: Nabors #486, McKenzie County, North Dakota
Job Number: RD0814M177ST1

MEASURED DEPTH feet	INCL deg.	AZIMUTH deg.	DOGLEG SEVERITY deg./ 100 ft.	VERTICAL DEPTH feet	CLOSURE DIST. feet	CLOSURE AZIMUTH deg.	HORIZONTAL COORDINATES feet	
16535.00	90.42	90.63	1.94	10775.61	6036.7	87.5	265.84 N	6030.82 E
16598.00	88.44	91.60	3.50	10776.24	6099.5	87.5	264.62 N	6093.80 E
16629.00	86.15	91.33	7.44	10777.70	6130.4	87.5	263.83 N	6124.76 E
16724.00	86.37	92.48	1.23	10783.90	6225.0	87.6	260.67 N	6219.50 E
16787.00	87.21	92.92	1.50	10787.42	6287.6	87.7	257.71 N	6282.33 E
16818.00	88.75	92.04	5.72	10788.52	6318.5	87.7	256.37 N	6313.28 E
16851.00	89.14	91.33	2.45	10789.12	6351.4	87.7	255.40 N	6346.26 E
16914.00	89.71	91.25	0.91	10789.76	6414.3	87.7	253.98 N	6409.24 E
16945.00	89.67	90.54	2.29	10789.92	6445.2	87.7	253.50 N	6440.24 E
17008.00	89.71	89.75	1.26	10790.26	6508.2	87.8	253.34 N	6503.24 E
17103.00	89.54	88.87	0.94	10790.89	6603.1	87.8	254.48 N	6598.23 E
17197.00	90.07	88.52	0.68	10791.21	6697.1	87.8	256.62 N	6692.20 E
17228.00	89.89	88.17	1.27	10791.22	6728.1	87.8	257.52 N	6723.19 E
17291.00	90.64	88.26	1.20	10790.93	6791.1	87.8	259.48 N	6786.16 E
17323.00	90.46	89.93	5.25	10790.62	6823.1	87.8	259.99 N	6818.15 E
17354.00	90.73	90.28	1.43	10790.30	6854.1	87.8	259.93 N	6849.15 E
17386.00	90.95	90.02	1.06	10789.83	6886.0	87.8	259.85 N	6881.14 E
17418.00	91.08	90.10	0.48	10789.26	6918.0	87.8	259.81 N	6913.14 E
17449.00	89.01	90.90	7.16	10789.24	6949.0	87.9	259.54 N	6944.14 E
17480.00	89.14	91.07	0.69	10789.74	6979.9	87.9	259.01 N	6975.13 E
17575.00	89.58	90.10	1.12	10790.80	7074.8	87.9	258.04 N	7070.11 E
17607.00	89.89	89.66	1.68	10790.95	7106.8	87.9	258.11 N	7102.11 E

A Gyrodata Directional Survey

Oasis Petroleum
Lease: Kline Federal Well: 5300 41-18 10B ST1, 6" Hole
Location: Nabors #486, McKenzie County, North Dakota
Job Number: RD0814M177ST1

MEASURED DEPTH feet	INCL deg.	AZIMUTH deg.	DOGLEG SEVERITY deg./ 100 ft.	VERTICAL DEPTH feet	CLOSURE DIST. feet	CLOSURE AZIMUTH deg.	HORIZONTAL COORDINATES feet	
17669.00	90.90	89.66	1.63	10790.52	7168.8	87.9	258.47 N	7164.11 E
17701.00	90.46	90.37	2.61	10790.14	7200.7	87.9	258.47 N	7196.11 E
17764.00	91.03	89.84	1.24	10789.32	7263.7	88.0	258.35 N	7259.10 E
17796.00	89.19	89.84	5.75	10789.26	7295.7	88.0	258.44 N	7291.10 E
17858.00	89.27	89.40	0.72	10790.09	7357.6	88.0	258.85 N	7353.09 E
17952.00	90.81	89.14	1.66	10790.03	7451.6	88.0	260.05 N	7447.08 E
18046.00	90.46	89.23	0.38	10788.98	7545.6	88.0	261.39 N	7541.07 E
18078.00	90.02	89.66	1.92	10788.85	7577.6	88.0	261.70 N	7573.07 E
18140.00	90.37	89.49	0.63	10788.64	7639.6	88.0	262.16 N	7635.06 E
18172.00	88.18	89.66	6.86	10789.04	7671.5	88.0	262.39 N	7667.06 E
18235.00	88.18	89.49	0.27	10791.04	7734.5	88.1	262.86 N	7730.02 E
18266.00	88.53	89.49	1.13	10791.93	7765.5	88.1	263.14 N	7761.01 E
18329.00	89.36	89.49	1.32	10793.09	7828.4	88.1	263.70 N	7824.00 E
18360.00	88.09	90.19	4.68	10793.78	7859.4	88.1	263.78 N	7854.99 E
18423.00	88.48	89.93	0.74	10795.67	7922.4	88.1	263.72 N	7917.96 E
18454.00	88.97	89.58	1.94	10796.36	7953.3	88.1	263.85 N	7948.95 E
18516.00	89.71	89.49	1.20	10797.07	8015.3	88.1	264.35 N	8010.95 E
18551.00	88.04	90.28	5.28	10797.76	8050.3	88.1	264.42 N	8045.94 E

A Gyrodata Directional Survey

Oasis Petroleum
Lease: Kline Federal Well: 5300 41-18 10B ST1, 6" Hole
Location: Nabors #486, McKenzie County, North Dakota
Job Number: RD0814M177ST1

MEASURED DEPTH feet	INCL deg.	AZIMUTH deg.	DOGLEG SEVERITY deg./ 100 ft.	VERTICAL DEPTH feet	CLOSURE DIST. feet	CLOSURE AZIMUTH deg.	HORIZONTAL COORDINATES feet	
STRAIGHT LINE PROJECTION TO BIT DEPTH AT 18629 FT. MD.								
18629.00	88.04	90.28	0.00	10800.43	8128.2	88.1	264.04 N	8123.89 E

Final Station Closure: Distance: 8128.18 ft Az: 88.14 deg.

Gyrodata Incorporated
301 Thelma Dr. #413
Casper, Wyoming 82601

307-472-0182
Fax: 307-472-0204

DIRECTIONAL SURVEY CERTIFICATION

RE: Oasis Petroleum (Operator)

Kline Federal 5300 41-18 10B ST2 (Well Name & No.)

8.19 (Magnetic Declination)

Surveyor: Blake Hunter

I, Kristopher Bertsch ,having personal knowledge of all the facts, hereby certify that the attached directional survey run from measured depth of 17952 feet to a measured depth of 20400 feet and is projected to 20478 feet, is true and correct as determined from all available records.

Signature	Title	Company
	MWD Coordinator	Gyrodata, Inc.

*All measurements recorded with a manned MWD Survey Tool.

A Gyrodata Directional Survey

FINAL DEFINITIVE COPY

for

OASIS PETROLEUM

Lease: Kline Federal Well: 5300 41-18 10B ST2, 6" Hole

Location: Nabors #486, McKenzie County, North Dakota

Job Number: RD0814M177ST2

Run Date: 26 Feb 2015

Surveyor: Blake Hunter

Calculation Method: MINIMUM CURVATURE

Survey Latitude: 48.068944 deg. N Longitude: 103.603319 deg. W

Magnetic Declination: 8.1900 deg

Total Correction: 8.1900 deg

Proposed Well Direction: 90.000 deg

Depth Reference: Rotary Table

Air Gap (RKB to Ground / RKB to MSL): 25.00

Ground Elevation (Ground to MSL / MSL to Mudline): 2057.00

Vertical Section Calculated from Well Head Location

Closure Calculated from Well Head Location

Horizontal Coordinates Calculated from Well Head Location

A Gyrodata Directional Survey

Oasis Petroleum
Lease: Kline Federal Well: 5300 41-18 10B ST2, 6" Hole
Location: Nabors #486, McKenzie County, North Dakota
Job Number: RD0814M177ST2

MEASURED DEPTH feet	INCL deg.	AZIMUTH deg.	DOGLEG SEVERITY deg./ 100 ft.	VERTICAL DEPTH feet	CLOSURE DIST. feet	CLOSURE AZIMUTH deg.	HORIZONTAL COORDINATES feet	
17858.00	89.27	89.40	0.00	10790.09	7357.6	88.0	258.85 N	7353.09 E

TIE-ON TO GYRODATA SURVEY OF ST1 AT 17858 FT. MD.
ALL AZIMUTHS ARE REFERENCED TO TRUE NORTH.
ALL MEASURED DEPTHS AND COORDINATES REFERENCED TO NABORS 486 R.K.B. AT 25 FT.
17952-20400 FT. MAGNETIC MEASUREMENT WHILE DRILLING SURVEY.
STRAIGHT LINE PROJECTION TO BIT DEPTH AT 20478 FT. MD.

17952.00	90.59	89.14	1.43	10790.20	7451.6	88.0	260.05 N	7447.08 E
17984.00	90.81	88.87	1.09	10789.81	7483.6	88.0	260.60 N	7479.07 E
18015.00	89.23	90.10	6.46	10789.80	7514.6	88.0	260.88 N	7510.07 E
18046.00	90.07	90.46	2.95	10789.99	7545.6	88.0	260.73 N	7541.07 E
18109.00	90.42	89.84	1.13	10789.72	7608.5	88.0	260.57 N	7604.07 E
18140.00	90.55	90.37	1.76	10789.46	7639.5	88.0	260.51 N	7635.07 E
18203.00	91.12	90.98	1.33	10788.54	7702.4	88.1	259.77 N	7698.05 E
18235.00	91.65	90.98	1.66	10787.77	7734.4	88.1	259.22 N	7730.04 E
18297.00	92.00	91.16	0.63	10785.79	7796.3	88.1	258.06 N	7792.00 E
18329.00	92.40	90.90	1.49	10784.57	7828.2	88.1	257.49 N	7823.97 E
18360.00	92.57	90.90	0.55	10783.22	7859.1	88.1	257.00 N	7854.94 E
18423.00	91.78	90.98	1.26	10780.83	7922.0	88.1	255.97 N	7917.88 E
18454.00	92.00	90.72	1.10	10779.81	7953.0	88.2	255.51 N	7948.86 E
18517.00	92.84	90.63	1.34	10777.15	8015.9	88.2	254.77 N	8011.80 E

A Gyrodata Directional Survey

Oasis Petroleum
Lease: Kline Federal Well: 5300 41-18 10B ST2, 6" Hole
Location: Nabors #486, McKenzie County, North Dakota
Job Number: RD0814M177ST2

MEASURED DEPTH feet	INCL deg.	AZIMUTH deg.	DOGLEG SEVERITY deg./ 100 ft.	VERTICAL DEPTH feet	CLOSURE DIST. feet	CLOSURE AZIMUTH deg.	HORIZONTAL COORDINATES feet	
18548.00	91.30	91.16	5.25	10776.03	8046.8	88.2	254.28 N	8042.78 E
18611.00	90.81	91.60	1.05	10774.87	8109.7	88.2	252.77 N	8105.75 E
18705.00	89.98	91.69	0.89	10774.22	8203.5	88.3	250.07 N	8199.70 E
18768.00	90.90	91.07	1.76	10773.74	8266.4	88.3	248.55 N	8262.68 E
18799.00	91.25	90.90	1.26	10773.16	8297.4	88.3	248.02 N	8293.67 E
18893.00	90.95	90.81	0.33	10771.35	8391.3	88.3	246.62 N	8387.65 E
18987.00	90.77	90.90	0.21	10769.94	8485.2	88.3	245.21 N	8481.62 E
19018.00	90.15	91.69	3.24	10769.69	8516.1	88.4	244.51 N	8512.61 E
19050.00	90.55	91.69	1.25	10769.50	8548.1	88.4	243.57 N	8544.60 E
19081.00	90.95	91.42	1.56	10769.09	8579.0	88.4	242.73 N	8575.59 E
19112.00	91.25	91.51	1.01	10768.49	8610.0	88.4	241.93 N	8606.57 E
19144.00	89.98	91.33	4.01	10768.15	8641.9	88.4	241.14 N	8638.56 E
19175.00	90.02	91.60	0.88	10768.15	8672.9	88.4	240.35 N	8669.55 E
19207.00	88.53	91.33	4.73	10768.56	8704.8	88.4	239.53 N	8701.53 E
19269.00	86.95	91.42	2.55	10771.00	8766.7	88.4	238.04 N	8763.47 E
19300.00	87.25	91.51	1.01	10772.57	8797.6	88.5	237.25 N	8794.42 E
19331.00	87.69	91.51	1.42	10773.94	8828.5	88.5	236.44 N	8825.37 E
19363.00	87.56	91.25	0.91	10775.26	8860.5	88.5	235.67 N	8857.34 E
19426.00	88.48	91.07	1.49	10777.44	8923.4	88.5	234.39 N	8920.29 E
19457.00	89.54	90.10	4.63	10777.98	8954.3	88.5	234.08 N	8951.28 E
19520.00	89.41	88.08	3.21	10778.55	9017.3	88.5	235.08 N	9014.27 E
19551.00	89.41	87.29	2.55	10778.87	9048.3	88.5	236.33 N	9045.24 E

A Gyrodata Directional Survey

Oasis Petroleum
Lease: Kline Federal Well: 5300 41-18 10B ST2, 6" Hole
Location: Nabors #486, McKenzie County, North Dakota
Job Number: RD0814M177ST2

MEASURED DEPTH feet	INCL deg.	AZIMUTH deg.	DOGLEG SEVERITY deg./ 100 ft.	VERTICAL DEPTH feet	CLOSURE DIST. feet	CLOSURE AZIMUTH deg.	HORIZONTAL COORDINATES feet	
19614.00	89.93	87.03	0.92	10779.24	9111.3	88.5	239.45 N	9108.16 E
19646.00	90.42	87.29	1.73	10779.14	9143.3	88.5	241.04 N	9140.12 E
19740.00	91.16	86.32	1.30	10777.84	9237.2	88.5	246.27 N	9233.96 E
19771.00	91.38	86.41	0.77	10777.15	9268.2	88.5	248.24 N	9264.89 E
19834.00	91.38	85.71	1.11	10775.64	9331.1	88.4	252.57 N	9327.73 E
19865.00	90.33	88.17	8.63	10775.17	9362.1	88.4	254.22 N	9358.68 E
19928.00	90.73	87.47	1.28	10774.59	9425.1	88.4	256.62 N	9421.63 E
19960.00	90.99	88.96	4.73	10774.11	9457.1	88.4	257.61 N	9453.61 E
19991.00	91.30	87.73	4.09	10773.49	9488.1	88.4	258.51 N	9484.59 E
20022.00	91.30	88.96	3.97	10772.79	9519.1	88.4	259.40 N	9515.57 E
20054.00	91.52	87.91	3.35	10772.00	9551.1	88.4	260.28 N	9547.54 E
20117.00	89.63	88.70	3.25	10771.37	9614.1	88.4	262.14 N	9610.51 E
20180.00	88.35	91.77	5.28	10772.48	9677.0	88.4	261.88 N	9673.49 E
20211.00	88.62	90.63	3.78	10773.30	9708.0	88.5	261.23 N	9704.47 E
20305.00	89.19	92.13	1.71	10775.10	9801.8	88.5	258.97 N	9798.42 E
20400.00	89.67	90.81	1.48	10776.04	9896.7	88.5	256.53 N	9893.39 E
STRAIGHT LINE PROJECTION TO BIT DEPTH AT 20478 FT. MD.								
20478.00	89.67	90.81	0.00	10776.49	9974.6	88.5	255.43 N	9971.38 E

Final Station Closure: Distance: 9974.65 ft Az: 88.53 deg.

A Gyrodata Directional Survey

Oasis Petroleum
Lease: Kline Federal Well: 5300 41-18 10B ST2, 6" Hole
Location: Nabors #486, McKenzie County, North Dakota
Job Number: RD0814M177ST2

MEASURED DEPTH feet	INCL deg.	AZIMUTH deg.	DOGLEG SEVERITY deg./ 100 ft.	VERTICAL DEPTH feet	CLOSURE DIST. feet	CLOSURE AZIMUTH deg.	HORIZONTAL COORDINATES feet

SUNDRY NOTICES AND REPORTS ON WELLS - FORM 4

INDUSTRIAL COMMISSION OF NORTH DAKOTA
OIL AND GAS DIVISION
600 EAST BOULEVARD DEPT 405
BISMARCK, ND 58505-0840
SFN 5749 (09-2006)

DEC 2014 RECEIVED ND OIL & GAS DIVISION

Well File No. **28652**

PLEASE READ INSTRUCTIONS BEFORE FILLING OUT FORM.
PLEASE SUBMIT THE ORIGINAL AND ONE COPY.

☑ Notice of Intent	Approximate Start Date **December 9, 2014**	☐ Drilling Prognosis	☐ Spill Report
☐ Report of Work Done	Date Work Completed	☐ Redrilling or Repair	☐ Shooting
☐ Notice of Intent to Begin a Workover Project that may Qualify for a Tax Exemption Pursuant to NDCC Section 57-51.1-03.	Approximate Start Date	☐ Casing or Liner	☐ Acidizing
		☐ Plug Well	☐ Fracture Treatment
		☐ Supplemental History	☐ Change Production Method
		☐ Temporarily Abandon	☐ Reclamation
		☐ Other	**Waiver from tubing/packer requirement**

Well Name and Number				
Kline Federal 5300 41-18 10B				
Footages	Qtr-Qtr	Section	Township	Range
500 F S L 237 F W L	**LOT 4**	**18**	**153 N**	**100 W**
Field	Pool	County		
BAKER	**Bakken**	**MCKENZIE**		

24-HOUR PRODUCTION RATE

Before		After	
Oil	Bbls	Oil	Bbls
Water	Bbls	Water	Bbls
Gas	MCF	Gas	MCF

Name of Contractor(s)			
Address	City	State	Zip Code

DETAILS OF WORK

Oasis Petroleum North America LLC requests a variance to NDAC 43-02-03-21 for the tubing/packer requirement: Casing, tubing, and cementing requirements during the completion period immediately following the upcoming fracture stimulation.

The following assurances apply:

1. the well is equipped with new 29# and 32# casing at surface with an API burst rating of 11,220 psi;
2. The Frac design will ise a safety factor of 0.85 API burst rating to determine the maximum pressure;
3. Damage to the casing during the frac would be detected immediately by montioring equipement;
4. The casing is exposed to significantly lower rates and pressures during flowback than during the frac job;
5. The frac fluid and formation fluids have very low corrosion and erosion rates;
6. Production equipment will be installed as soon as possible after the well ceases flowing;
7. A 300# gauge will be installed on the surface casing during the flowback period

Company		Telephone Number
Oasis Petroleum North America LLC		**281-404-9436**
Address		
1001 Fannin, Suite 1500		
City	State	Zip Code
Houston	**TX**	**77002**
Signature	Printed Name	
	Jennifer Swenson	
Title	Date	
Regulatory Assistant	**December 9, 2014**	
Email Address		
jswenson@oasispetroleum.com		

FOR STATE USE ONLY

☐ Received	☑ Approved
Date	December 22, 2014
By	
Title	PETROLEUM ENGINEER

SUNDRY NOTICES AND REPORTS ON WELLS - FORM 4

INDUSTRIAL COMMISSION OF NORTH DAKOTA
OIL AND GAS DIVISION
600 EAST BOULEVARD DEPT 405
BISMARCK, ND 58505-0840
SFN 5749 (09-2006)

JUL 2014
RECEIVED
ND OIL & GAS
DIVISION

Well File No.
28652

PLEASE READ INSTRUCTIONS BEFORE FILLING OUT FORM.
PLEASE SUBMIT THE ORIGINAL AND ONE COPY.

☑ Notice of Intent	Approximate Start Date **July 28, 2014**	☐ Drilling Prognosis	☐ Spill Report
☐ Report of Work Done	Date Work Completed	☐ Redrilling or Repair	☐ Shooting
☐ Notice of Intent to Begin a Workover Project that may Qualify for a Tax Exemption Pursuant to NDCC Section 57-51.1-03.	Approximate Start Date	☑ Casing or Liner	☐ Acidizing
		☐ Plug Well	☐ Fracture Treatment
		☐ Supplemental History	☐ Change Production Method
		☐ Temporarily Abandon	☐ Reclamation
		☐ Other **Change casing**	

Well Name and Number				
Kline Federal 5300 41-18 10B				
Footages	Qtr-Qtr	Section	Township	Range
500 F S L 237 F W L	**SWSW**	**18**	**153 N**	**100 W**
Field	Pool	County		
Baker	**Bakken**	**McKenzie**		

24-HOUR PRODUCTION RATE

Before		After	
Oil	Bbls	Oil	Bbls
Water	Bbls	Water	Bbls
Gas	MCF	Gas	MCF

Name of Contractor(s)			
Address	City	State	Zip Code

DETAILS OF WORK

Oasis Petroleum respectfully requests permission to make the following changes to the above referenced well:

Surface Casing: 13-3/8, 54.5#, 17-1/2" Hole, 2,072' MD
Dakota Contingency: 9-5/8, 40#, 12-1/4" Hole, 6,101' MD

Attached are revised plats, drill plan, well summary, directional plan and plot

Company **Oasis Petroleum North America LLC**		Telephone Number **281-404-9563**
Address **1001 Fannin, Suite 1500**		
City **Houston**	State **TX**	Zip Code **77002**
Signature Heather McCowan	Printed Name **Heather McCowan**	
Title **Regulatory Assistant**	Date **July 28, 2014**	
Email Address **hmccowan@oasispetroleum.com**		

FOR STATE USE ONLY

☐ Received	☒ Approved
Date 8-5-14	
By Nathaniel Erbele	
Title Petroleum Resource Specialist	

Project: Indian Hills
Site: 153N-100W-17/18
Well: Kline Federal 5300 41-18 10B
Wellbore: Kline Federal 5300 41-18 10B
Design: Design #1

OASIS PETROLEUM

WELL DETAILS: Kline Federal 5300 41-18 10B

Ground Level: 2057.0

Northing	Easting	Latitude	Longitude
405202.44	1209970.87	48° 4' 8.200 N	103° 36' 11.950 W

CASING DETAILS

VD	MD	Name	Size
0765.0	11037.0	7"	7

Azimuths to True North
Magnetic North: 8.27°

Magnetic Field
Strength: 56438.3snT
Dip Angle: 72.99°
Date: 5/19/2014
Model: IGRF2010

SECTION DETAILS

MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	Target
0.0	0.00	0.00	0.0	0.0	0.0	0.00	
2200.0	0.00	0.00	2200.0	0.0	0.0	0.00	
2216.7	0.50	74.25	2216.7	0.0	0.1	3.00	
7926.7	0.50	74.25	7926.4	13.5	48.0	0.00	
7943.3	0.00	0.00	7943.1	13.6	48.1	3.00	
10287.8	0.00	0.00	10287.6	13.6	48.1	0.00	
11037.0	89.90	74.25	10765.0	142.9	506.8	12.00	
11824.6	89.90	90.00	10766.4	250.5	1284.6	2.00	
20590.0	89.90	90.00	10781.7	250.0	10050.0	0.00	5300 41-18 10B PBHL

Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well Kline Federal 5300 41-18 10B
Company:	Oasis Petroleum	TVD Reference:	WELL @ 2082.0usft (Original Well Elev)
Project:	Indian Hills	MD Reference:	WELL @ 2082.0usft (Original Well Elev)
Site:	153N-100W-17/18	North Reference:	True
Well:	Kline Federal 5300 41-18 10B	Survey Calculation Method:	Minimum Curvature
Wellbore:	Kline Federal 5300 41-18 10B		
Design:	Design #1		

Project Indian Hills

Map System:	US State Plane 1983	**System Datum:**	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	North Dakota Northern Zone		

Site 153N-100W-17/18

Site Position:		**Northing:**	408,962.44 usft	**Latitude:**	48° 4' 45.380 N
From:	Lat/Long	**Easting:**	1,210,229.18 usft	**Longitude:**	103° 36' 10.380 W
Position Uncertainty:	0.0 usft	**Slot Radius:**	13-3/16 "	**Grid Convergence:**	-2.31 °

Well Kline Federal 5300 41-18 10B

Well Position	**+N/-S**	-3,767.4 usft	**Northing:**	405,202.44 usft	**Latitude:**	48° 4' 8.200 N
	+E/-W	-106.6 usft	**Easting:**	1,209,970.87 usft	**Longitude:**	103° 36' 11.950 W
Position Uncertainty		2.0 usft	**Wellhead Elevation:**		**Ground Level:**	2,057.0 usft

Wellbore Kline Federal 5300 41-18 10B

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	5/19/2014	8.27	72.99	56,438

Design Design #1

Audit Notes:

Version:		**Phase:**	PROTOTYPE	**Tie On Depth:**	0.0

Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.0	0.0	0.0	90.00

Plan Sections

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	
2,200.0	0.00	0.00	2,200.0	0.0	0.0	0.00	0.00	0.00	0.00	
2,216.7	0.50	74.25	2,216.7	0.0	0.1	3.00	3.00	0.00	74.25	
7,926.7	0.50	74.25	7,926.4	13.5	48.0	0.00	0.00	0.00	0.00	
7,943.3	0.00	0.00	7,943.1	13.6	48.1	3.00	-3.00	0.00	180.00	
10,287.8	0.00	0.00	10,287.6	13.6	48.1	0.00	0.00	0.00	0.00	
11,037.0	89.90	74.25	10,765.0	142.9	506.8	12.00	12.00	0.00	74.25	
11,824.6	89.90	90.00	10,766.4	250.5	1,284.6	2.00	0.00	2.00	90.01	
20,590.0	89.90	90.00	10,781.7	250.0	10,050.0	0.00	0.00	0.00	0.00	5300 41-18 10B PBHI

Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well Kline Federal 5300 41-18 10B
Company:	Oasis Petroleum	TVD Reference:	WELL @ 2082.0usft (Original Well Elev)
Project:	Indian Hills	MD Reference:	WELL @ 2082.0usft (Original Well Elev)
Site:	153N-100W-17/18	North Reference:	True
Well:	Kline Federal 5300 41-18 10B	Survey Calculation Method:	Minimum Curvature
Wellbore:	Kline Federal 5300 41-18 10B		
Design:	Design #1		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
2,200.0	0.00	0.00	2,200.0	0.0	0.0	0.0	0.00	0.00	0.00
2,216.7	0.50	74.25	2,216.7	0.0	0.1	0.1	3.00	3.00	0.00
2,300.0	0.50	74.25	2,300.0	0.2	0.8	0.8	0.00	0.00	0.00
2,400.0	0.50	74.25	2,400.0	0.5	1.6	1.6	0.00	0.00	0.00
2,500.0	0.50	74.25	2,500.0	0.7	2.4	2.4	0.00	0.00	0.00
2,600.0	0.50	74.25	2,600.0	0.9	3.3	3.3	0.00	0.00	0.00
2,700.0	0.50	74.25	2,700.0	1.2	4.1	4.1	0.00	0.00	0.00
2,800.0	0.50	74.25	2,800.0	1.4	5.0	5.0	0.00	0.00	0.00
2,900.0	0.50	74.25	2,900.0	1.6	5.8	5.8	0.00	0.00	0.00
3,000.0	0.50	74.25	3,000.0	1.9	6.6	6.6	0.00	0.00	0.00
3,100.0	0.50	74.25	3,100.0	2.1	7.5	7.5	0.00	0.00	0.00
3,200.0	0.50	74.25	3,200.0	2.3	8.3	8.3	0.00	0.00	0.00
3,300.0	0.50	74.25	3,300.0	2.6	9.2	9.2	0.00	0.00	0.00
3,400.0	0.50	74.25	3,400.0	2.8	10.0	10.0	0.00	0.00	0.00
3,500.0	0.50	74.25	3,500.0	3.1	10.8	10.8	0.00	0.00	0.00
3,600.0	0.50	74.25	3,599.9	3.3	11.7	11.7	0.00	0.00	0.00
3,700.0	0.50	74.25	3,699.9	3.5	12.5	12.5	0.00	0.00	0.00
3,800.0	0.50	74.25	3,799.9	3.8	13.4	13.4	0.00	0.00	0.00
3,900.0	0.50	74.25	3,899.9	4.0	14.2	14.2	0.00	0.00	0.00
4,000.0	0.50	74.25	3,999.9	4.2	15.0	15.0	0.00	0.00	0.00
4,100.0	0.50	74.25	4,099.9	4.5	15.9	15.9	0.00	0.00	0.00
4,200.0	0.50	74.25	4,199.9	4.7	16.7	16.7	0.00	0.00	0.00
4,300.0	0.50	74.25	4,299.9	5.0	17.6	17.6	0.00	0.00	0.00
4,400.0	0.50	74.25	4,399.9	5.2	18.4	18.4	0.00	0.00	0.00
4,500.0	0.50	74.25	4,499.9	5.4	19.2	19.2	0.00	0.00	0.00
4,600.0	0.50	74.25	4,599.9	5.7	20.1	20.1	0.00	0.00	0.00
4,646.1	0.50	74.25	4,646.0	5.8	20.5	20.5	0.00	0.00	0.00
Greenhorn									
4,700.0	0.50	74.25	4,699.9	5.9	20.9	20.9	0.00	0.00	0.00
4,800.0	0.50	74.25	4,799.9	6.1	21.8	21.8	0.00	0.00	0.00
4,900.0	0.50	74.25	4,899.9	6.4	22.6	22.6	0.00	0.00	0.00
5,000.0	0.50	74.25	4,999.9	6.6	23.4	23.4	0.00	0.00	0.00
5,057.1	0.50	74.25	5,057.0	6.7	23.9	23.9	0.00	0.00	0.00
Mowry									
5,100.0	0.50	74.25	5,099.9	6.8	24.3	24.3	0.00	0.00	0.00
5,200.0	0.50	74.25	5,199.9	7.1	25.1	25.1	0.00	0.00	0.00
5,300.0	0.50	74.25	5,299.9	7.3	26.0	26.0	0.00	0.00	0.00
5,400.0	0.50	74.25	5,399.9	7.6	26.8	26.8	0.00	0.00	0.00
5,471.1	0.50	74.25	5,471.0	7.7	27.4	27.4	0.00	0.00	0.00
Dakota									
5,500.0	0.50	74.25	5,499.9	7.8	27.6	27.6	0.00	0.00	0.00
5,600.0	0.50	74.25	5,599.9	8.0	28.5	28.5	0.00	0.00	0.00
5,700.0	0.50	74.25	5,699.9	8.3	29.3	29.3	0.00	0.00	0.00
5,800.0	0.50	74.25	5,799.9	8.5	30.2	30.2	0.00	0.00	0.00
5,900.0	0.50	74.25	5,899.9	8.7	31.0	31.0	0.00	0.00	0.00
6,000.0	0.50	74.25	5,999.9	9.0	31.8	31.8	0.00	0.00	0.00
6,100.0	0.50	74.25	6,099.9	9.2	32.7	32.7	0.00	0.00	0.00
6,200.0	0.50	74.25	6,199.8	9.5	33.5	33.5	0.00	0.00	0.00
6,300.0	0.50	74.25	6,299.8	9.7	34.4	34.4	0.00	0.00	0.00
6,400.0	0.50	74.25	6,399.8	9.9	35.2	35.2	0.00	0.00	0.00
6,486.2	0.50	74.25	6,486.0	10.1	35.9	35.9	0.00	0.00	0.00
Rierdon									
6,500.0	0.50	74.25	6,499.8	10.2	36.0	36.0	0.00	0.00	0.00

Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well Kline Federal 5300 41-18 10B
Company:	Oasis Petroleum	TVD Reference:	WELL @ 2082.0usft (Original Well Elev)
Project:	Indian Hills	MD Reference:	WELL @ 2082.0usft (Original Well Elev)
Site:	153N-100W-17/18	North Reference:	True
Well:	Kline Federal 5300 41-18 10B	Survey Calculation Method:	Minimum Curvature
Wellbore:	Kline Federal 5300 41-18 10B		
Design:	Design #1		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
6,600.0	0.50	74.25	6,599.8	10.4	36.9	36.9	0.00	0.00	0.00
6,700.0	0.50	74.25	6,699.8	10.6	37.7	37.7	0.00	0.00	0.00
6,800.0	0.50	74.25	6,799.8	10.9	38.6	38.6	0.00	0.00	0.00
6,814.2	0.50	74.25	6,814.0	10.9	38.7	38.7	0.00	0.00	0.00
Dunham Salt									
6,900.0	0.50	74.25	6,899.8	11.1	39.4	39.4	0.00	0.00	0.00
6,929.2	0.50	74.25	6,929.0	11.2	39.6	39.6	0.00	0.00	0.00
Dunham Salt Base									
7,000.0	0.50	74.25	6,999.8	11.4	40.2	40.2	0.00	0.00	0.00
7,024.2	0.50	74.25	7,024.0	11.4	40.4	40.4	0.00	0.00	0.00
Spearfish									
7,100.0	0.50	74.25	7,099.8	11.6	41.1	41.1	0.00	0.00	0.00
7,200.0	0.50	74.25	7,199.8	11.8	41.9	41.9	0.00	0.00	0.00
7,283.2	0.50	74.25	7,283.0	12.0	42.6	42.6	0.00	0.00	0.00
Pine Salt									
7,300.0	0.50	74.25	7,299.8	12.1	42.8	42.8	0.00	0.00	0.00
7,318.2	0.50	74.25	7,318.0	12.1	42.9	42.9	0.00	0.00	0.00
Pine Salt Base									
7,374.2	0.50	74.25	7,374.0	12.2	43.4	43.4	0.00	0.00	0.00
Opeche Salt									
7,400.0	0.50	74.25	7,399.8	12.3	43.6	43.6	0.00	0.00	0.00
7,403.2	0.50	74.25	7,403.0	12.3	43.6	43.6	0.00	0.00	0.00
Opeche Salt Base									
7,500.0	0.50	74.25	7,499.8	12.5	44.4	44.4	0.00	0.00	0.00
7,600.0	0.50	74.25	7,599.8	12.8	45.3	45.3	0.00	0.00	0.00
7,605.2	0.50	74.25	7,605.0	12.8	45.3	45.3	0.00	0.00	0.00
Broom Creek (Top of Minnelusa Gp.)									
7,684.2	0.50	74.25	7,684.0	13.0	46.0	46.0	0.00	0.00	0.00
Amsden									
7,700.0	0.50	74.25	7,699.8	13.0	46.1	46.1	0.00	0.00	0.00
7,800.0	0.50	74.25	7,799.8	13.2	47.0	47.0	0.00	0.00	0.00
7,853.2	0.50	74.25	7,853.0	13.4	47.4	47.4	0.00	0.00	0.00
Tyler									
7,900.0	0.50	74.25	7,899.8	13.5	47.8	47.8	0.00	0.00	0.00
7,926.7	0.50	74.25	7,926.4	13.5	48.0	48.0	0.00	0.00	0.00
7,943.3	0.00	0.00	7,943.1	13.6	48.1	48.1	3.00	-3.00	0.00
8,000.0	0.00	0.00	7,999.8	13.6	48.1	48.1	0.00	0.00	0.00
8,047.2	0.00	0.00	8,047.0	13.6	48.1	48.1	0.00	0.00	0.00
Otter (Base of Minnelusa Gp.)									
8,100.0	0.00	0.00	8,099.8	13.6	48.1	48.1	0.00	0.00	0.00
8,200.0	0.00	0.00	8,199.8	13.6	48.1	48.1	0.00	0.00	0.00
8,300.0	0.00	0.00	8,299.8	13.6	48.1	48.1	0.00	0.00	0.00
8,390.2	0.00	0.00	8,390.0	13.6	48.1	48.1	0.00	0.00	0.00
Kibbey Lime									
8,400.0	0.00	0.00	8,399.8	13.6	48.1	48.1	0.00	0.00	0.00
8,500.0	0.00	0.00	8,499.8	13.6	48.1	48.1	0.00	0.00	0.00
8,542.2	0.00	0.00	8,542.0	13.6	48.1	48.1	0.00	0.00	0.00
Charles Salt									
8,600.0	0.00	0.00	8,599.8	13.6	48.1	48.1	0.00	0.00	0.00
8,700.0	0.00	0.00	8,699.8	13.6	48.1	48.1	0.00	0.00	0.00
8,800.0	0.00	0.00	8,799.8	13.6	48.1	48.1	0.00	0.00	0.00
8,900.0	0.00	0.00	8,899.8	13.6	48.1	48.1	0.00	0.00	0.00

Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well Kline Federal 5300 41-18 10B
Company:	Oasis Petroleum	TVD Reference:	WELL @ 2082.0usft (Original Well Elev)
Project:	Indian Hills	MD Reference:	WELL @ 2082.0usft (Original Well Elev)
Site:	153N-100W-17/18	North Reference:	True
Well:	Kline Federal 5300 41-18 10B	Survey Calculation Method:	Minimum Curvature
Wellbore:	Kline Federal 5300 41-18 10B		
Design:	Design #1		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
9,000.0	0.00	0.00	8,999.8	13.6	48.1	48.1	0.00	0.00	0.00
9,100.0	0.00	0.00	9,099.8	13.6	48.1	48.1	0.00	0.00	0.00
9,159.2	0.00	0.00	9,159.0	13.6	48.1	48.1	0.00	0.00	0.00
UB									
9,200.0	0.00	0.00	9,199.8	13.6	48.1	48.1	0.00	0.00	0.00
9,238.2	0.00	0.00	9,238.0	13.6	48.1	48.1	0.00	0.00	0.00
Base Last Salt									
9,300.0	0.00	0.00	9,299.8	13.6	48.1	48.1	0.00	0.00	0.00
9,301.2	0.00	0.00	9,301.0	13.6	48.1	48.1	0.00	0.00	0.00
Ratcliffe									
9,400.0	0.00	0.00	9,399.8	13.6	48.1	48.1	0.00	0.00	0.00
9,454.2	0.00	0.00	9,454.0	13.6	48.1	48.1	0.00	0.00	0.00
Mission Canyon									
9,500.0	0.00	0.00	9,499.8	13.6	48.1	48.1	0.00	0.00	0.00
9,600.0	0.00	0.00	9,599.8	13.6	48.1	48.1	0.00	0.00	0.00
9,700.0	0.00	0.00	9,699.8	13.6	48.1	48.1	0.00	0.00	0.00
9,800.0	0.00	0.00	9,799.8	13.6	48.1	48.1	0.00	0.00	0.00
9,900.0	0.00	0.00	9,899.8	13.6	48.1	48.1	0.00	0.00	0.00
10,000.0	0.00	0.00	9,999.8	13.6	48.1	48.1	0.00	0.00	0.00
10,022.2	0.00	0.00	10,022.0	13.6	48.1	48.1	0.00	0.00	0.00
Lodgepole									
10,100.0	0.00	0.00	10,099.8	13.6	48.1	48.1	0.00	0.00	0.00
10,200.0	0.00	0.00	10,199.8	13.6	48.1	48.1	0.00	0.00	0.00
10,209.2	0.00	0.00	10,209.0	13.6	48.1	48.1	0.00	0.00	0.00
Lodgepole Fracture Zone									
10,287.8	0.00	0.00	10,287.6	13.6	48.1	48.1	0.00	0.00	0.00
KOP Build 12°/100'									
10,300.0	1.46	74.25	10,299.8	13.6	48.2	48.2	12.00	12.00	0.00
10,325.0	4.46	74.25	10,324.7	14.0	49.5	49.5	12.00	12.00	0.00
10,350.0	7.46	74.25	10,349.6	14.7	52.0	52.0	12.00	12.00	0.00
10,375.0	10.46	74.25	10,374.3	15.7	55.7	55.7	12.00	12.00	0.00
10,400.0	13.46	74.25	10,398.8	17.1	60.7	60.7	12.00	12.00	0.00
10,425.0	16.46	74.25	10,422.9	18.9	66.9	66.9	12.00	12.00	0.00
10,450.0	19.46	74.25	10,446.7	21.0	74.4	74.4	12.00	12.00	0.00
10,475.0	22.46	74.25	10,470.0	23.4	83.0	83.0	12.00	12.00	0.00
10,500.0	25.46	74.25	10,492.9	26.2	92.7	92.7	12.00	12.00	0.00
10,525.0	28.46	74.25	10,515.1	29.2	103.6	103.6	12.00	12.00	0.00
10,550.0	31.46	74.25	10,536.8	32.6	115.7	115.7	12.00	12.00	0.00
10,575.0	34.46	74.25	10,557.8	36.3	128.8	128.8	12.00	12.00	0.00
10,600.0	37.46	74.25	10,578.0	40.3	142.9	142.9	12.00	12.00	0.00
10,625.0	40.46	74.25	10,597.4	44.6	158.0	158.0	12.00	12.00	0.00
10,650.0	43.46	74.25	10,616.0	49.1	174.1	174.1	12.00	12.00	0.00
10,675.0	46.46	74.25	10,633.7	53.9	191.1	191.1	12.00	12.00	0.00
10,700.0	49.46	74.25	10,650.5	58.9	209.0	209.0	12.00	12.00	0.00
10,725.0	52.46	74.25	10,666.2	64.2	227.7	227.7	12.00	12.00	0.00
10,750.0	55.46	74.25	10,680.9	69.7	247.1	247.1	12.00	12.00	0.00
10,775.0	58.46	74.25	10,694.5	75.4	267.3	267.3	12.00	12.00	0.00
10,800.0	61.46	74.25	10,707.0	81.3	288.1	288.1	12.00	12.00	0.00
10,825.0	64.46	74.25	10,718.4	87.3	309.5	309.5	12.00	12.00	0.00
10,843.4	66.67	74.25	10,726.0	91.8	325.6	325.6	12.00	12.00	0.00
False Bakken									
10,850.0	67.46	74.25	10,728.6	93.5	331.5	331.5	12.00	12.00	0.00
10,867.5	69.57	74.25	10,735.0	97.9	347.2	347.2	12.00	12.00	0.00

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Project:	Indian Hills	MD Reference:	WELL @ 2082.0usft (Original Well Elev)
Site:	153N-100W-17/18	North Reference:	True
Well:	Kline Federal 5300 41-18 10B	Survey Calculation Method:	Minimum Curvature
Wellbore:	Kline Federal 5300 41-18 10B		
Design:	Design #1		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
Upper Bakken									
10,875.0	70.46	74.25	10,737.6	99.8	354.0	354.0	12.00	12.00	0.00
10,900.0	73.46	74.25	10,745.3	106.3	376.8	376.8	12.00	12.00	0.00
10,921.7	76.07	74.25	10,751.0	112.0	397.0	397.0	12.00	12.00	0.00
Middle Bakken									
10,925.0	76.46	74.25	10,751.8	112.8	400.1	400.1	12.00	12.00	0.00
10,950.0	79.46	74.25	10,757.0	119.5	423.6	423.6	12.00	12.00	0.00
10,968.3	81.66	74.25	10,760.0	124.4	441.0	441.0	12.00	12.00	0.00
Middle Bakken Sand Target									
10,975.0	82.46	74.25	10,760.9	126.2	447.4	447.4	12.00	12.00	0.00
11,000.0	85.46	74.25	10,763.6	132.9	471.3	471.3	12.00	12.00	0.00
11,025.0	88.46	74.25	10,764.9	139.7	495.3	495.3	12.00	12.00	0.00
11,037.0	89.90	74.25	10,765.0	143.0	506.9	506.9	11.97	11.97	0.00
EOC - 7"									
11,100.0	89.90	75.51	10,765.2	159.4	567.7	567.7	2.00	0.00	2.00
11,200.0	89.90	77.51	10,765.3	182.7	664.9	664.9	2.00	0.00	2.00
11,300.0	89.90	79.51	10,765.5	202.6	762.9	762.9	2.00	0.00	2.00
11,400.0	89.90	81.51	10,765.7	219.1	861.5	861.5	2.00	0.00	2.00
11,500.0	89.90	83.51	10,765.9	232.1	960.7	960.7	2.00	0.00	2.00
11,600.0	89.90	85.51	10,766.0	241.7	1,060.2	1,060.2	2.00	0.00	2.00
11,700.0	89.90	87.51	10,766.2	247.8	1,160.0	1,160.0	2.00	0.00	2.00
11,800.0	89.90	89.51	10,766.4	250.4	1,260.0	1,260.0	2.00	0.00	2.00
11,824.6	89.90	90.00	10,766.4	250.5	1,284.6	1,284.6	2.00	0.00	2.00
11,900.0	89.90	90.00	10,766.6	250.5	1,360.0	1,360.0	0.00	0.00	0.00
12,000.0	89.90	90.00	10,766.7	250.5	1,460.0	1,460.0	0.00	0.00	0.00
12,100.0	89.90	90.00	10,766.9	250.5	1,560.0	1,560.0	0.00	0.00	0.00
12,200.0	89.90	90.00	10,767.1	250.5	1,660.0	1,660.0	0.00	0.00	0.00
12,300.0	89.90	90.00	10,767.3	250.5	1,760.0	1,760.0	0.00	0.00	0.00
12,400.0	89.90	90.00	10,767.4	250.5	1,860.0	1,860.0	0.00	0.00	0.00
12,500.0	89.90	90.00	10,767.6	250.5	1,960.0	1,960.0	0.00	0.00	0.00
12,600.0	89.90	90.00	10,767.8	250.5	2,060.0	2,060.0	0.00	0.00	0.00
12,700.0	89.90	90.00	10,768.0	250.4	2,160.0	2,160.0	0.00	0.00	0.00
12,800.0	89.90	90.00	10,768.1	250.4	2,260.0	2,260.0	0.00	0.00	0.00
12,900.0	89.90	90.00	10,768.3	250.4	2,360.0	2,360.0	0.00	0.00	0.00
13,000.0	89.90	90.00	10,768.5	250.4	2,460.0	2,460.0	0.00	0.00	0.00
13,100.0	89.90	90.00	10,768.7	250.4	2,560.0	2,560.0	0.00	0.00	0.00
13,200.0	89.90	90.00	10,768.8	250.4	2,660.0	2,660.0	0.00	0.00	0.00
13,300.0	89.90	90.00	10,769.0	250.4	2,760.0	2,760.0	0.00	0.00	0.00
13,400.0	89.90	90.00	10,769.2	250.4	2,860.0	2,860.0	0.00	0.00	0.00
13,500.0	89.90	90.00	10,769.3	250.4	2,960.0	2,960.0	0.00	0.00	0.00
13,600.0	89.90	90.00	10,769.5	250.4	3,060.0	3,060.0	0.00	0.00	0.00
13,700.0	89.90	90.00	10,769.7	250.4	3,160.0	3,160.0	0.00	0.00	0.00
13,800.0	89.90	90.00	10,769.9	250.4	3,260.0	3,260.0	0.00	0.00	0.00
13,874.6	89.90	90.00	10,770.0	250.4	3,334.6	3,334.6	0.00	0.00	0.00
Base Middle Bakken Sand Target									
13,900.0	89.90	90.00	10,770.0	250.4	3,360.0	3,360.0	0.00	0.00	0.00
14,000.0	89.90	90.00	10,770.2	250.4	3,460.0	3,460.0	0.00	0.00	0.00
14,100.0	89.90	90.00	10,770.4	250.4	3,560.0	3,560.0	0.00	0.00	0.00
14,200.0	89.90	90.00	10,770.6	250.4	3,660.0	3,660.0	0.00	0.00	0.00
14,300.0	89.90	90.00	10,770.7	250.4	3,760.0	3,760.0	0.00	0.00	0.00
14,400.0	89.90	90.00	10,770.9	250.4	3,860.0	3,860.0	0.00	0.00	0.00
14,500.0	89.90	90.00	10,771.1	250.3	3,960.0	3,960.0	0.00	0.00	0.00
14,600.0	89.90	90.00	10,771.3	250.3	4,060.0	4,060.0	0.00	0.00	0.00
14,700.0	89.90	90.00	10,771.4	250.3	4,160.0	4,160.0	0.00	0.00	0.00

Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well Kline Federal 5300 41-18 10B
Company:	Oasis Petroleum	TVD Reference:	WELL @ 2082.0usft (Original Well Elev)
Project:	Indian Hills	MD Reference:	WELL @ 2082.0usft (Original Well Elev)
Site:	153N-100W-17/18	North Reference:	True
Well:	Kline Federal 5300 41-18 10B	Survey Calculation Method:	Minimum Curvature
Wellbore:	Kline Federal 5300 41-18 10B		
Design:	Design #1		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
14,800.0	89.90	90.00	10,771.6	250.3	4,260.0	4,260.0	0.00	0.00	0.00
14,900.0	89.90	90.00	10,771.8	250.3	4,360.0	4,360.0	0.00	0.00	0.00
15,000.0	89.90	90.00	10,772.0	250.3	4,460.0	4,460.0	0.00	0.00	0.00
15,100.0	89.90	90.00	10,772.1	250.3	4,560.0	4,560.0	0.00	0.00	0.00
15,200.0	89.90	90.00	10,772.3	250.3	4,660.0	4,660.0	0.00	0.00	0.00
15,300.0	89.90	90.00	10,772.5	250.3	4,760.0	4,760.0	0.00	0.00	0.00
15,400.0	89.90	90.00	10,772.7	250.3	4,860.0	4,860.0	0.00	0.00	0.00
15,500.0	89.90	90.00	10,772.8	250.3	4,960.0	4,960.0	0.00	0.00	0.00
15,600.0	89.90	90.00	10,773.0	250.3	5,060.0	5,060.0	0.00	0.00	0.00
15,700.0	89.90	90.00	10,773.2	250.3	5,160.0	5,160.0	0.00	0.00	0.00
15,800.0	89.90	90.00	10,773.4	250.3	5,260.0	5,260.0	0.00	0.00	0.00
15,900.0	89.90	90.00	10,773.5	250.3	5,360.0	5,360.0	0.00	0.00	0.00
16,000.0	89.90	90.00	10,773.7	250.3	5,460.0	5,460.0	0.00	0.00	0.00
16,100.0	89.90	90.00	10,773.9	250.3	5,560.0	5,560.0	0.00	0.00	0.00
16,200.0	89.90	90.00	10,774.1	250.3	5,660.0	5,660.0	0.00	0.00	0.00
16,300.0	89.90	90.00	10,774.2	250.2	5,760.0	5,760.0	0.00	0.00	0.00
16,400.0	89.90	90.00	10,774.4	250.2	5,860.0	5,860.0	0.00	0.00	0.00
16,500.0	89.90	90.00	10,774.6	250.2	5,960.0	5,960.0	0.00	0.00	0.00
16,600.0	89.90	90.00	10,774.7	250.2	6,060.0	6,060.0	0.00	0.00	0.00
16,700.0	89.90	90.00	10,774.9	250.2	6,160.0	6,160.0	0.00	0.00	0.00
16,800.0	89.90	90.00	10,775.1	250.2	6,260.0	6,260.0	0.00	0.00	0.00
16,900.0	89.90	90.00	10,775.3	250.2	6,360.0	6,360.0	0.00	0.00	0.00
17,000.0	89.90	90.00	10,775.4	250.2	6,460.0	6,460.0	0.00	0.00	0.00
17,100.0	89.90	90.00	10,775.6	250.2	6,560.0	6,560.0	0.00	0.00	0.00
17,200.0	89.90	90.00	10,775.8	250.2	6,660.0	6,660.0	0.00	0.00	0.00
17,300.0	89.90	90.00	10,776.0	250.2	6,760.0	6,760.0	0.00	0.00	0.00
17,400.0	89.90	90.00	10,776.1	250.2	6,860.0	6,860.0	0.00	0.00	0.00
17,500.0	89.90	90.00	10,776.3	250.2	6,960.0	6,960.0	0.00	0.00	0.00
17,600.0	89.90	90.00	10,776.5	250.2	7,060.0	7,060.0	0.00	0.00	0.00
17,700.0	89.90	90.00	10,776.7	250.2	7,160.0	7,160.0	0.00	0.00	0.00
17,800.0	89.90	90.00	10,776.8	250.2	7,260.0	7,260.0	0.00	0.00	0.00
17,900.0	89.90	90.00	10,777.0	250.2	7,360.0	7,360.0	0.00	0.00	0.00
18,000.0	89.90	90.00	10,777.2	250.1	7,460.0	7,460.0	0.00	0.00	0.00
18,100.0	89.90	90.00	10,777.4	250.1	7,560.0	7,560.0	0.00	0.00	0.00
18,200.0	89.90	90.00	10,777.5	250.1	7,660.0	7,660.0	0.00	0.00	0.00
18,300.0	89.90	90.00	10,777.7	250.1	7,760.0	7,760.0	0.00	0.00	0.00
18,400.0	89.90	90.00	10,777.9	250.1	7,860.0	7,860.0	0.00	0.00	0.00
18,500.0	89.90	90.00	10,778.1	250.1	7,960.0	7,960.0	0.00	0.00	0.00
18,600.0	89.90	90.00	10,778.2	250.1	8,060.0	8,060.0	0.00	0.00	0.00
18,700.0	89.90	90.00	10,778.4	250.1	8,160.0	8,160.0	0.00	0.00	0.00
18,800.0	89.90	90.00	10,778.6	250.1	8,260.0	8,260.0	0.00	0.00	0.00
18,900.0	89.90	90.00	10,778.8	250.1	8,360.0	8,360.0	0.00	0.00	0.00
19,000.0	89.90	90.00	10,778.9	250.1	8,460.0	8,460.0	0.00	0.00	0.00
19,100.0	89.90	90.00	10,779.1	250.1	8,560.0	8,560.0	0.00	0.00	0.00
19,200.0	89.90	90.00	10,779.3	250.1	8,660.0	8,660.0	0.00	0.00	0.00
19,300.0	89.90	90.00	10,779.5	250.1	8,760.0	8,760.0	0.00	0.00	0.00
19,400.0	89.90	90.00	10,779.6	250.1	8,860.0	8,860.0	0.00	0.00	0.00
19,500.0	89.90	90.00	10,779.8	250.1	8,960.0	8,960.0	0.00	0.00	0.00
19,600.0	89.90	90.00	10,780.0	250.1	9,060.0	9,060.0	0.00	0.00	0.00
19,700.0	89.90	90.00	10,780.1	250.1	9,160.0	9,160.0	0.00	0.00	0.00
19,800.0	89.90	90.00	10,780.3	250.0	9,260.0	9,260.0	0.00	0.00	0.00
19,900.0	89.90	90.00	10,780.5	250.0	9,360.0	9,360.0	0.00	0.00	0.00
20,000.0	89.90	90.00	10,780.7	250.0	9,460.0	9,460.0	0.00	0.00	0.00
20,100.0	89.90	90.00	10,780.8	250.0	9,560.0	9,560.0	0.00	0.00	0.00

Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well Kline Federal 5300 41-18 10B
Company:	Oasis Petroleum	TVD Reference:	WELL @ 2082.0usft (Original Well Elev)
Project:	Indian Hills	MD Reference:	WELL @ 2082.0usft (Original Well Elev)
Site:	153N-100W-17/18	North Reference:	True
Well:	Kline Federal 5300 41-18 10B	Survey Calculation Method:	Minimum Curvature
Wellbore:	Kline Federal 5300 41-18 10B		
Design:	Design #1		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
20,200.0	89.90	90.00	10,781.0	250.0	9,660.0	9,660.0	0.00	0.00	0.00
20,300.0	89.90	90.00	10,781.2	250.0	9,760.0	9,760.0	0.00	0.00	0.00
20,400.0	89.90	90.00	10,781.4	250.0	9,860.0	9,860.0	0.00	0.00	0.00
20,500.0	89.90	90.00	10,781.5	250.0	9,960.0	9,960.0	0.00	0.00	0.00
20,590.0	89.90	90.00	10,781.7	250.0	10,050.0	10,050.0	0.00	0.00	0.00
5300 41-18 10B PBHL									

Design Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
5300 41-18 10B PBHL - plan hits target center - Point	0.00	0.00	10,781.7	250.0	10,050.0	405,047.29	1,220,022.78	48° 4' 10.641 N	103° 33' 43.967 W

Casing Points

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
11,037.0	10,765.0	7"	7	8-3/4

Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well Kline Federal 5300 41-18 10B
Company:	Oasis Petroleum	TVD Reference:	WELL @ 2082.0usft (Original Well Elev)
Project:	Indian Hills	MD Reference:	WELL @ 2082.0usft (Original Well Elev)
Site:	153N-100W-17/18	North Reference:	True
Well:	Kline Federal 5300 41-18 10B	Survey Calculation Method:	Minimum Curvature
Wellbore:	Kline Federal 5300 41-18 10B		
Design:	Design #1		

Formations

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
1,972.0	1,972.0	Pierre			
4,646.1	4,646.0	Greenhorn			
5,057.1	5,057.0	Mowry			
5,471.1	5,471.0	Dakota			
6,486.2	6,486.0	Rierdon			
6,814.2	6,814.0	Dunham Salt			
6,929.2	6,929.0	Dunham Salt Base			
7,024.2	7,024.0	Spearfish			
7,283.2	7,283.0	Pine Salt			
7,318.2	7,318.0	Pine Salt Base			
7,374.2	7,374.0	Opeche Salt			
7,403.2	7,403.0	Opeche Salt Base			
7,605.2	7,605.0	Broom Creek (Top of Minnelusa Gp.)			
7,684.2	7,684.0	Amsden			
7,853.2	7,853.0	Tyler			
8,047.2	8,047.0	Otter (Base of Minnelusa Gp.)			
8,390.2	8,390.0	Kibbey Lime			
8,542.2	8,542.0	Charles Salt			
9,159.2	9,159.0	UB			
9,238.2	9,238.0	Base Last Salt			
9,301.2	9,301.0	Ratcliffe			
9,454.2	9,454.0	Mission Canyon			
10,022.2	10,022.0	Lodgepole			
10,209.2	10,209.0	Lodgepole Fracture Zone			
10,843.4	10,726.0	False Bakken			
10,867.5	10,735.0	Upper Bakken			
10,921.7	10,751.0	Middle Bakken			
10,968.3	10,760.0	Middle Bakken Sand Target			
13,874.6	10,770.0	Base Middle Bakken Sand Target			

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	+E/-W (usft)	Comment
10,287.8	10,287.6	13.6	48.1	KOP Build 12°/100'
11,037.0	10,765.0	143.0	506.9	EOC

Oasis Petroleum
Well Summary
Kline Federal 5300 41-18 10B
Section 18 T153N R100W
McKenzie County, ND

SURFACE CASING AND CEMENT DESIGN

							Make-up Torque (ft-lbs)		
Size	**Interval**	**Weight**	**Grade**	**Coupling**	**I.D.**	**Drift**	**Minimum**	**Optimum**	**Max**
13-3/8"	0' to 2,072'	54.5	J-55	STC	12.615"	12.459"	4,100	5,470	6,840

Interval	Description	Collapse	Burst	Tension
		(psi) a	(psi) b	(1000 lbs) c
0' to 2,072'	13-3/8", 54.5#, J-55, STC, 8rd	1130 / 1.17	2730 / 2.82	514 / 2.61

API Rating & Safety Factor

a) Based on full casing evacuation with 9 ppg fluid on backside (2,072' setting depth).

b) Burst pressure based on 9 ppg fluid with no fluid on backside (2,072' setting depth).

c) Based on string weight in 9 ppg fluid at 2,072' TVD plus 100k# overpull. (Buoyed weight equals 97k lbs.)

Cement volumes are based on 13-3/8" casing set in 17-1/2" hole with 50% excess to circulate cement back to surface. Mix and pump the following slurry.

Pre-flush (Spacer): **20 bbls** fresh water

Lead Slurry: **635 sks** (328 bbls) 2.9 yield conventional system with 94 lb/sk cement, .25 lb/sk D130 Lost Circulation Control Agent, 2% $CaCl_2$, 4% D079 Extender and 2% D053 Expanding Agent.

Tail Slurry: **349 sks** (72 bbls) 1.16 yield conventional system with 94 lb/sk cement, .25% $CaCl_2$ and 0.25 lb/sk Lost Circulation Control Agent

Oasis Petroleum
Well Summary
Kline Federal 5300 31-18 10B
Section 18 T153N R100W
McKenzie County, ND

CONTINGENCY SURFACE CASING AND CEMENT DESIGN

							Make-up Torque (ft-lbs)		
Size	Interval	Weight	Grade	Coupling	I.D.	Drift	Minimum	Optimum	Max
9-5/8"	0' to 6,101'	40	HCL-80	LTC	8.835"	8.75"	5,450	7,270	9,090

Interval	Description	Collapse	Burst	Tension
		(psi) a	(psi) b	(1000 lbs) c
0' to 6,101'	9-5/8", 40#, HCL-80, LTC, 8rd	4230 / 2.13	5750 / 3.72	837 / 2.78

API Rating & Safety Factor

a) Collapse pressure based on 11.5 ppg fluid on the backside and 9 ppg fluid inside of casing.

b) Burst pressure calculated from a gas kick coming from the production zone (Bakken Pool) at 9,000 psi and a subsequent breakdown at the 9-5/8" shoe, based on a 13.5#/ft facture gradient. Backup of 9 ppg fluid.

c) Yield based on string weight in 10 ppg fluid, (207k lbs buoyed weight) plus 100k lbs overpull.

Cement volumes are based on 9-5/8" casing set in 12-1/4" hole with 10% excess in OH and 0% excess inside surface casing. TOC at surface.

Pre-flush (Spacer): **20 bbls** Chem wash

Lead Slurry: **598 sks** (309 bbls) Conventional system with 75 lb/sk cement, 0.5 lb/sk lost circulation, 10% expanding agent, 2% extender, 2% $CaCl_2$, 0.2% anti-foam and 0.4% fluid loss agent.

Tail Slurry: **349 sks** (72 bbls) Conventional system with 94 lb/sk cement, 0.3% anti-settling agent, 0.3% fluid loss agent, 0.3 lb/sk lost circulation control agent, 0.2% anti-foam and 0.1% retarder.

Oasis Petroleum
Well Summary
Kline Federal 5300 41-18 10B
Section 18 T153N R100W
McKenzie County, ND

INTERMEDIATE CASING AND CEMENT DESIGN

							Make-up Torque (ft-lbs)		
Size	Interval	Weight	Grade	Coupling	I.D.	Drift	Minimum	Optimum	Max
7"	0' – 6,664'	29	P-110	LTC	6.184"	6.059"	5,980	7,970	8,770
7"	6,664' – 10,288'	32	HCP-110	LTC	6.094"	6.000***	6,730	8,970	9,870
7"	10,288' – 11,037'	29	P-110	LTC	6.184"	6.059"	5,980	7,970	8,770

***Special drift

Interval	Length	Description	Collapse	Burst	Tension
			(psi) a	(psi) b	(1000 lbs) c
0' – 6,664'	6,664'	7", 29#, P-110, LTC, 8rd	8530 / 2.46*	11220 / 1.19	797 / 2.09
6,664' – 10,288'	3,624'	7", 32#, HCP-110, LTC, 8rd	11820 / 2.20*	12460 / 1.29	
6,664' – 10,288'	3,624'	7", 32#, HCP-110, LTC, 8rd	11820 / 1.07**	12460 / 1.29	
10,288' – 11,037'	749'	7", 29 lb, P-110, LTC, 8rd	8530 / 1.52*	11220 / 1.16	

API Rating & Safety Factor

a) *Assume full casing evacuation with 10 ppg fluid on backside. **Assume full casing evacuation with 1.2 psi/ft equivalent fluid gradient across salt intervals.

b) Burst pressure based on 9000 psig max press for stimulation plus 10.2 ppg fluid in casing and 9 ppg fluid on backside-to 10,765' TVD.

c) Based on string weight in 10 ppg fluid, (280k lbs buoyed weight) plus 100k

Cement volumes are estimates based on 7" casing set in an 8-3/4" hole with 30% excess.

Pre-flush (Spacer): **50 bbls Saltwater**
40 bbls Weighted MudPush Express

Lead Slurry: **157 sks** (72 bbls) 2.21 yield conventional system with 47 lb/sk cement, 37 lb/sk D035 extender, 3.0% KCl, 3.0% D154 extender, 0.3% D208 viscosifier, 0.07% retarder, 0.2% anti-foam, 0.5 lb/sk, D130 LCM.

Tail Slurry: **608 sks** (168 bbls) 1.54 yield conventional system with 94 lb/sk cement, 3.0% KCl, 35.0% Silica, 0.5% retarder, 0.2% fluid loss, 0.2% anti-foam and 0.5 lb/sk LCM.

Oasis Petroleum
Well Summary
Kline Federal 5300 41-18 10B
Section 18 T153N R100W
McKenzie County, ND

PRODUCTION LINER

Size	**Interval**	**Weight**	**Grade**	**Coupling**	**I.D.**	**Drift**	**Estimated Torque**
4-1/2"	10,238' – 20,590'	13.5	P-110	BTC	3.92"	3.795"	4,500

Interval	**Description**	**Collapse**	**Burst**	**Tension**
		(psi) **a**	(psi) **b**	(1000 lbs) **c**
10,238' – 20,590'	4-1/2", 13.5 lb, P-110, BTC, 8rd	10680 / 2.00	12410 / 1.28	443 / 2.01

API Rating & Safety Factor

a) Based on full casing evacuation with 9.5 ppg fluid on backside @ 10,782' TVD.

b) Burst pressure based on 9000 psi treating pressure with 10.2 ppg internal fluid gradient and 9 ppg external fluid gradient @ 10,782' TVD.

c) Based on string weight in 9.5 ppg fluid (Buoyed weight: 119k lbs.) plus 100k lbs overpull.

Oasis Petroleum does not use Diesel Fuel, as defined by the US EPA in the list below, in our hydraulic fracture operations.

68334-30-5 (Primary Name: Fuels, diesel)
68476-34-6 (Primary Name: Fuels, diesel, No. 2)
68476-30-2 (Primary Name: Fuel oil No. 2)
68476-31-3 (Primary Name: Fuel oil, No. 4)
8008-20-6 (Primary Name: Kerosene)

DRILLING PLAN

OPERATOR	Oasis Petroleum	**COUNTY/STATE**	McKenzie Co., ND
WELL NAME	Kline Federal 5300 41-18 10B	**RIG**	0
WELL TYPE	Horizontal Middle Bakken		
LOCATION	SWNW 18-153N-100W	Surface Location (survey plat): 500' fsl	237' fwl
EST. T.D.	20,590'	**GROUND ELEV:**	2057 Finished Pad Elev. **Sub Height:** 25
	TOTAL LATERAL 9,553'	**KB ELEV:**	2082

PROGNOSIS: Based on 2,082' KB(est)

MARKER		DEPTH (Surf Loc)	DATUM (Surf Loc)
Pierre	NDIC MAP	1,972	110
Greenhorn		4,646	(2,564)
Mowry		5,057	(2,975)
Dakota		5,471	(3,389)
Rierdon		6,486	(4,404)
Dunham Salt		6,814	(4,732)
Dunham Salt Base		6,929	(4,847)
Spearfish		7,024	(4,942)
Pine Salt		7,283	(5,201)
Pine Salt Base		7,318	(5,236)
Opeche Salt		7,374	(5,292)
Opeche Salt Base		7,403	(5,321)
Broom Creek (Top of Minnelusa Gp)		7,605	(5,523)
Amsden		7,684	(5,602)
Tyler		7,853	(5,771)
Otter (Base of Minnelusa Gp.)		8,047	(5,965)
Kibbey Lime		8,390	(6,308)
Charles Salt		8,542	(6,460)
UB		9,159	(7,077)
Base Last Salt		9,238	(7,156)
Ratcliffe		9,301	(7,219)
Mission Canyon		9,454	(7,372)
Lodgepole		10,022	(7,940)
Lodgepole Fracture Zone		10,209	(8,127)
False Bakken		10,726	(8,644)
Upper Bakken		10,735	(8,653)
Middle Bakken		10,751	(8,669)
Middle Bakken Sand Target		10,760	(8,678)
Base Middle Bakken Sand Target		10,770	(8,688)
Lower Bakken		10,785	(8,703)
Three Forks		10,813	(8,731)

Dip Rate: -0.1

Max. Anticipated BHP: 4673

LOGS:

	Type	Interval
OH Logs:	Triple Combo KOP to Kibby (or min run of 1800' whichever is greater); GR/Res to BSC; GR to surf; CND through the Dakota	
CBL/GR:	Above top of cement/GR to base of casing	
MWD GR:	KOP to lateral TD	

DEVIATION:

Surf:	3 deg max., 1 deg / 100'; srvy every 500'
Prod:	5 deg. max., 1 deg / 100'; srvy every 100'

DST'S: None planned

CORES: None planned

MUDLOGGING:

Two-Man: 8,342'

~200' above the Charles (Kibbey) to Casing point; Casing point to TD

30' samples at direction of wellsite geologist; 10' through target @ curve land

BOP: 11" 5000 psi blind, pipe & annular

Surface Formation: *Glacial till*

MUD:	Interval		Type	WT	Vis	WL	Remarks
Surface:	0' -	2,072'	FW/Gel - Lime Sweeps	8.4-9.0	28-32	NC	Circ Mud Tanks
Intermediate:	2,072' -	11,037'	Invert	9.5-10.4	40-50	30+HtHp	Circ Mud Tanks
Lateral:	11,037' -	20,590'	Salt Water	9.8-10.2	28-32	NC	Circ Mud Tanks

CASING:	Size	Wt ppf	Hole	Depth		Cement	WOC	Remarks
Surface:	13-3/8"	54.5#	17-1/2"	2,072'		To Surface	12	100' into Pierre
Dakota Contingency:	9-5/8"	40#	12-1/4"	6,101'		To Surface	12	Below Dakota
Intermediate:	7"	29/32#	8-3/4"	11,037'		3971	24	1500' above Dakota
Production Liner:	4.5"	13.5#	6"	20,590'	TOL @ 10,238'			50' above KOP

PROBABLE PLUGS, IF REQ'D:

OTHER:

	MD	TVD	FNL/FSL	FEL/FWL	S-T-R	AZI
Surface:	2,072	2,072	500' FSL	237' FWL	SEC 18-T153N-R100W	Survey Company:
KOP:	10,288'	10,288'	514' FSL	285' FWL	SEC 18-T153N-R100W	Build Rate: 12 deg /100'
EOC:	11,037'	10,765'	643' FSL	744' FWL	SEC 18-T153N-R100W	74.25
Casing Point:	11,037'	10,765'	643' FSL	744' FWL	SEC 18-T153N-R100W	74.25
Middle Bakken Lateral TD:	20,590'	10,782'	750' FSL	200' FEL	SEC 17-T153N-R100W	90.00

Comments:

Request a Sundry for an Open Hole Log Waiver

Exception well: Oasis Petroleum's Kline Federal 5300 11-18H (153N 100W 18 NW NW)

35 packers, 35 sleeves, no frac string

Oasis Petroleum does not use Diesel Fuel, as defined by the US EPA in the list below, in our hydraulic fracture operations.

68334-30-5 (Primary Name: Fuels, diesel) 68476-34-6 (Primary Name: Fuels, diesel, No. 2)68476-30-2 (Primary Name: Fuel oil No. 2)

68476-31-3 (Primary Name: Fuel oil, No. 4)8008-20-6 (Primary Name: Kerosene)

OASIS PETROLEUM

Geology: M. Steed 4/3/2014 **Engineering: hbader rpm 7/18/14**

Oil and Gas Division

Lynn D. Helms - Director Bruce E. Hicks - Assistant Director

Department of Mineral Resources

Lynn D. Helms - Director

North Dakota Industrial Commission

www.dmr.nd.gov/oilgas 28652

BRANDI TERRY
OASIS PETROLEUM NORTH AMERICA LLC
1001 FANNIN STE 1500
HOUSTON, TX 77002 USA

Date: **6/23/2014**

RE: CORES AND SAMPLES

Well Name: **KLINE FEDERAL 5300 41-18 10B** Well File No.: **28652**
Location: **LOT4 18-153-100** County: MCKENZIE
Permit Type: **Development - HORIZONTAL**
Field: **BAKER** Target Horizon: BAKKEN

Dear BRANDI TERRY:

North Dakota Century Code Section 38-08-04 provides for the preservation of cores and samples and their shipment to the State Geologist when requested. The following is required on the above referenced well:

1) All cores, core chips and samples must be submitted to the State Geologist as provided for under North Dakota Century Code: Section 38-08-04 and North Dakota Administrative Code: Section 43-02-03-38.1.

2) Samples: The Operator is to begin collecting sample drill cuttings no lower than the:

Base of the Last Charles Salt

- Sample cuttings shall be collected at:
  - 30' maximum intervals through all vertical and build sections.
  - 100' maximum intervals through any horizontal sections.
- Samples must be washed, dried, placed in standard sample envelopes (3" x 4.5"), packed in the correct order into standard sample boxes (3.5" x 5.25" x 15.25").
- Samples boxes are to be carefully identified with a label that indicates the operator, well name, well file number, American Petroleum Institute (API) number, location and depth of samples; and forwarded in to the state core and sample library within 30 days of the completion of drilling operations.

3) Cores: Any cores cut shall be preserved in correct order, boxed in standard core boxes (4.5", 4.5", 35.75"), and the entire core forwarded to the state core and samples library within 180 days of completion of drilling operations. Any extension of time must have approval on a Form 4 Sundry Notice.

All cores, core chips, and samples must be shipped, prepaid, to the state core and samples library at the following address:

ND Geological Survey Core Library
2835 Campus Road, Stop 8156
Grand Forks, ND 58202

North Dakota Century Code Section 38-08-16 allows for a civil penalty for any violation of Chapter 38 08 not to exceed $12,500 for each offense, and each day's violation is a separate offense.

Sincerely

Stephen Fried
Geologist

SUNDRY NOTICES AND REPORTS ON WELLS - FORM 4

INDUSTRIAL COMMISSION OF NORTH DAKOTA
OIL AND GAS DIVISION
600 EAST BOULEVARD DEPT 405
BISMARCK, ND 58505-0840
SFN 5749 (09-2006)

JUN 2014
RECEIVED
ND OIL & GAS DIVISION

Well File No. 28652

PLEASE READ INSTRUCTIONS BEFORE FILLING OUT FORM.
PLEASE SUBMIT THE ORIGINAL AND ONE COPY.

☑ Notice of Intent	Approximate Start Date: October 1, 2014	☐ Drilling Prognosis	☐ Spill Report
☐ Report of Work Done	Date Work Completed:	☐ Redrilling or Repair	☐ Shooting
☐ Notice of Intent to Begin a Workover Project that may Qualify for a Tax Exemption Pursuant to NDCC Section 57-51.1-03.	Approximate Start Date:	☐ Casing or Liner	☐ Acidizing
		☐ Plug Well	☐ Fracture Treatment
		☐ Supplemental History	☐ Change Production Method
		☐ Temporarily Abandon	☐ Reclamation
		☑ Other	Waiver to rule Rule 43-02-03-31

Well Name and Number					
Kline Federal 5300 41-18 10B					
Footages	Qtr-Qtr	Section	Township	Range	
500 F S L 237 F W L	Lot 4	18	153 N	100 W	
Field	Pool	County			
	Bakken	McKenzie			

24-HOUR PRODUCTION RATE

Before		After	
Oil	Bbls	Oil	Bbls
Water	Bbls	Water	Bbls
Gas	MCF	Gas	MCF

Name of Contractor(s)			
Address	City	State	Zip Code

DETAILS OF WORK

Oasis Petroleum respectfully requests a waiver to Rule 43-02-03-31 in regards to running open hole logs for the above referenced well. Justification for this request is as follows:

#20275

The Oasis Petroleum's Kline Federal 5300 11-18H (153N 100W 18 NW NW) located within a mile of the subject well

If this exception is approved, Oasis Petroleum will run a CBL on the intermediate string, and we will also run GR to surface. Oasis Petroleum will also submit two digital copies of each cased hole log and a copy of the mud log containing MWD gamma ray.

Company: Oasis Petroleum North America LLC		Telephone Number: 281-404-9563
Address: 1001 Fannin, Suite 1500		
City: Houston	State: TX	Zip Code: 77002
Signature: Heather McCowan	Printed Name: Heather McCowan	
Title: Regulatory Assistant	Date: May 29, 2014	
Email Address: hmccowan@oasispetroleum.com		

FOR STATE USE ONLY

☐ Received	☒ Approved
Date: 6-17-2014	
By:	
Title: Stephen Fried Geologist	

SUNDRY NOTICES AND REPORTS ON WELLS - FORM 4

INDUSTRIAL COMMISSION OF NORTH DAKOTA
OIL AND GAS DIVISION
600 EAST BOULEVARD DEPT 405
BISMARCK, ND 58505-0840
SFN 5749 (09-2006)

Well File No. 28652

PLEASE READ INSTRUCTIONS BEFORE FILLING OUT FORM.
PLEASE SUBMIT THE ORIGINAL AND ONE COPY.

☑ Notice of Intent — Approximate Start Date: **October 1, 2014**

☐ Report of Work Done — Date Work Completed:

☐ Notice of Intent to Begin a Workover Project that may Qualify for a Tax Exemption Pursuant to NDCC Section 57-51.1-03. — Approximate Start Date:

☐ Drilling Prognosis ☐ Spill Report
☐ Redrilling or Repair ☐ Shooting
☐ Casing or Liner ☐ Acidizing
☐ Plug Well ☐ Fracture Treatment
☐ Supplemental History ☐ Change Production Method
☐ Temporarily Abandon ☐ Reclamation
☑ Other **Suspension of Drilling**

Well Name and Number					
Kline Federal 5300 41-18 10B					
Footages	Qtr-Qtr	Section	Township	Range	
500 F S L 237 F WL	SWSW	18	153 N	100 W	
Field	Pool	County			
	Bakken	McKenzie			

24-HOUR PRODUCTION RATE

Before		After	
Oil	Bbls	Oil	Bbls
Water	Bbls	Water	Bbls
Gas	MCF	Gas	MCF

Name of Contractor(s)			
Advanced Energy Services			
Address	City	State	Zip Code

DETAILS OF WORK

Oasis Petroleum North America LLC requests permission for suspension of drilling for up to 90 days for the referenced well under NDAC 43-02-03-55. Oasis Petroleum North America LLC intends to drill the surface hole with freshwater based drilling mud and set surface casing with a small drilling rig and move off within 3 to 5 days. The casing will be set at a depth pre-approved by the NDIC per the Application for Permit to Drill NDAC 43-02-03-21. No saltwater will be used in the drilling and cementing operations of the surface casing. Once the surface casing is cemented, a plug or mechanical seal will be placed at the top of the casing to prevent any foreign matter from getting into the well. A rig capable of drilling to TD will move onto the location within the 90 days previously outlined to complete the drilling and casing plan as per the APD. The undersigned states that this request for suspension of drilling operations in accordance with the Subsection 4 of Section 43-02-03-55 of the NDAC, is being requested to take advantage of the cost savings and time savings of using an initial rig that is smaller than the rig necessary to drill a well to total depth but is not intended to alter or extend the terms and conditions of, or suspend any obligation under, any oil and gas lease with acreage in or under the spacing or drilling unit for the above-referenced well. Oasis Petroleum North America LLC understands NDAC 43-02-03-31 requirements regarding confidentiality pertaining to this permit. The drilling pit will be fenced immediately after construction if the well pad is located in a pasture (NDAC 43-02-03-19 & 19.1). Oasis Petroleum North America LL will plug and abandon the well and reclaim the well site if the well is not drilled by the larger rotary rig within 90 days after spudding the well with the smaller drilling rig.

Notify NDIC inspector Richard Dunn at 701-770-3554 with spud and TD info.

Company		Telephone Number
Oasis Petroleum North America LLC		**(281) 404-9563**
Address		
1001 Fannin, Suite 1500		
City	State	Zip Code
Houston	**TX**	**77002**
Signature: Heather McCowan	Printed Name: **Heather McCowan**	
Title: **Regulatory Assistant**	Date: **May 29, 2014**	
Email Address: **hmccowan@oasispetroleum.com**		

FOR STATE USE ONLY

☐ Received ☒ Approved

Date: 6/17/14

By: Nathaniel Erbele

Title: Petroleum Resource Specialist

Oil and Gas Division

Lynn D. Helms - Director Bruce E. Hicks - Assistant Director

Department of Mineral Resources

Lynn D. Helms - Director

North Dakota Industrial Commission

www.oilgas.nd.gov

June 17, 2014

Heather McCowan
Regulatory Assistant
OASIS PETROLEUM NORTH AMERICA LLC
1001 Fannin Suite 1500
Houston, TX 77002

RE: HORIZONTAL WELL
KLINE FEDERAL 5300 41-18 10B
LOT4 Section 18-153N-100W
McKenzie County
Well File # 28652

Dear Heather:

Pursuant to Commission Order No. 23752, approval to drill the above captioned well is hereby given. The approval is granted on the condition that all portions of the well bore not isolated by cement, be no closer than the 500' setback from the north & south boundaries and 200' setback from the east & west boundaries within the 1280 acre spacing unit consisting of Sections 18 & 17 T153N R100W.

PERMIT STIPULATIONS: Due to the proximity of Lake Sakakawea to the well site, a dike is required surrounding the entire location. Effective June 1, 2014, a covered leak-proof container (with placard) for filter sock disposal must be maintained on the well site beginning when the well is spud, and must remain on-site during clean-out, completion, and flow-back whenever filtration operations are conducted. OASIS PETRO NO AMER must contact NDIC Field Inspector Richard Dunn at 701-770-3554 prior to location construction.

Drilling pit

NDAC 43-02-03-19.4 states that "a pit may be utilized to bury drill cuttings and solids generated during well drilling and completion operations, providing the pit can be constructed, used and reclaimed in a manner that will prevent pollution of the land surface and freshwaters. Reserve and circulation of mud system through earthen pits are prohibited. All pits shall be inspected by an authorized representative of the director prior to lining and use. Drill cuttings and solids must be stabilized in a manner approved by the director prior to placement in a cuttings pit."

Form 1 Changes & Hard Lines

Any changes, shortening of casing point or lengthening at Total Depth must have prior approval by the NDIC. The proposed directional plan is at a legal location. Based on the azimuth of the proposed lateral the maximum legal coordinate from the well head is: 10052' east.

Location Construction Commencement (Three Day Waiting Period)

Operators shall not commence operations on a drill site until the 3rd business day following publication of the approved drilling permit on the NDIC - OGD Daily Activity Report. If circumstances require operations to commence before the 3rd business day following publication on the Daily Activity Report, the waiting period may be waived by the Director. Application for a waiver must be by sworn affidavit providing the information necessary to evaluate the extenuating circumstances, the factors of NDAC 43-02-03-16.2 (1), (a)-(f), and any other information that would allow the Director to conclude that in the event another owner seeks revocation of the drilling permit, the applicant should retain the permit.

Permit Fee & Notification

Payment was received in the amount of $100 via credit card .The permit fee has been received. It is requested that notification be given immediately upon the spudding of the well. This information should be relayed to the Oil & Gas Division, Bismarck, via telephone. The following information must be included: Well name, legal location, permit number, drilling contractor, company representative, date and time of spudding. Office hours are 8:00 a.m. to 12:00 p.m. and 1:00 p.m. to 5:00 p.m. Central Time. Our telephone number is (701) 328-8020, leave a message if after hours or on the weekend.

Survey Requirements for Horizontal, Horizontal Re-entry, and Directional Wells

NDAC Section 43-02-03-25 (Deviation Tests and Directional Surveys) states in part (that) the survey contractor shall file a certified copy of all surveys with the director free of charge within thirty days of completion. Surveys must be submitted as one electronic copy, or in a form approved by the director. However, the director may require the directional survey to be filed immediately after completion if the survey is needed to conduct the operation of the director's office in a timely manner. Certified surveys must be submitted via email in one adobe document, with a certification cover page to certsurvey@nd.gov.
Survey points shall be of such frequency to accurately determine the entire location of the well bore.
Specifically, the Horizontal and Directional well survey frequency is 100 feet in the vertical, 30 feet in the curve (or when sliding) and 90 feet in the lateral.

Surface casing cement

Tail cement utilized on surface casing must have a minimum compressive strength of 500 psi within 12 hours, and tail cement utilized on production casing must have a minimum compressive strength of 500 psi before drilling the plug or initiating tests.

Logs

NDAC Section 43-02-03-31 requires the running of (1) a suite of open hole logs from which formation tops and porosity zones can be determined, (2) a Gamma Ray Log run from total depth to ground level elevation of the well bore, and (3) a log from which the presence and quality of cement can be determined (Standard CBL or Ultrasonic cement evaluation log) in every well in which production or intermediate casing has been set, this log must be run prior to completing the well. All logs run must be submitted free of charge, as one digital TIFF (tagged image file format) copy and one digital LAS (log ASCII) formatted copy. Digital logs may be submitted on a standard CD, DVD, or attached to an email sent to digitallogs@nd.gov
Thank you for your cooperation.

Sincerely,

Nathaniel Erbele
Petroleum Resource Specialist

APPLICATION FOR PERMIT TO DRILL HORIZONTAL WELL - FORM 1H

INDUSTRIAL COMMISSION OF NORTH DAKOTA
OIL AND GAS DIVISION
600 EAST BOULEVARD DEPT 405
BISMARCK, ND 58505-0840
SFN 54269 (08-2005)

PLEASE READ INSTRUCTIONS BEFORE FILLING OUT FORM.
PLEASE SUBMIT THE ORIGINAL AND ONE COPY.

Type of Work	Type of Well	Approximate Date Work Will Start	Confidential Status
New Location	Oil & Gas	10 / 1 / 2013	No

Operator	Telephone Number
OASIS PETROLEUM NORTH AMERICA LLC	281-404-9591

Address	City	State	Zip Code
1001 Fannin Suite 1500	Houston	TX	77002

☑ Notice has been provided to the owner of any permanently occupied dwelling within 1,320 feet.

☑ This well is not located within five hundred feet of an occupied dwelling.

WELL INFORMATION (If more than one lateral proposed, enter data for additional laterals on page 2)

Well Name	Well Number
KLINE FEDERAL	5300 41-18 10B

Surface Footages	Qtr-Qtr	Section	Township	Range	County
500 F S L 237 F W L	LOT4	18	153 N	100 W	McKenzie

Longstring Casing Point Footages	Qtr-Qtr	Section	Township	Range	County
642 F S L 743 F W L	LOT4	18	153 N	100 W	McKenzie

Longstring Casing Point Coordinates From Well Head	Azimuth	Longstring Total Depth
142 N From WH 506 E From WH	74.25 º	11037 Feet MD 10765 Feet TVD

Bottom Hole Footages From Nearest Section Line	Qtr-Qtr	Section	Township	Range	County
750 F S L 202 F E L	LOT4	17	153 N	100 W	McKenzie

Bottom Hole Coordinates From Well Head	KOP Lateral 1	Azimuth Lateral 1	Estimated Total Depth Lateral 1
250 N From WH 10050 E From WH	10288 Feet MD	90 º	20590 Feet MD 10781 Feet TVD

Latitude of Well Head	Longitude of Well Head	NAD Reference	Description of (Subject to NDIC Approval)
48 ° 04 ' 8.20 "	-103 ° 36 ' 11.95 "	NAD83	Spacing Unit: Sections 18 & 17 T153N R100W

Ground Elevation	Acres in Spacing/Drilling Unit	Spacing/Drilling Unit Setback Requirement	Industrial Commission Order
2055 Feet Above S.L.	1280	500 Feet N/S 200 Feet E/W	23752

North Line of Spacing/Drilling Unit	South Line of Spacing/Drilling Unit	East Line of Spacing/Drilling Unit	West Line of Spacing/Drilling Unit
10544 Feet	10489 Feet	5244 Feet	5256 Feet

Objective Horizons	Pierre Shale Top
Bakken	1972

Proposed	Size	Weight	Depth	Cement Volume	
Surface Casing	9 - 5/8 "	36 Lb./Ft.	2072 Feet	749 Sacks	NOTE: Surface hole must be drilled with fresh water and surface casing must be cemented back to surface.

Proposed	Size	Weight(s)	Longstring Total Depth	Cement Volume	Cement Top	Top Dakota Sand
Longstring Casing	7 - "	29/32 Lb./Ft.	11037 Feet MD 10765 Feet TVD	752 Sacks	3971 Feet	5471 Feet

Base Last Charles Salt (If Applicable)	
9238 Feet	NOTE: Intermediate or longstring casing string must be cemented above the top Dakota Group Sand.

Proposed Logs
Triple Combo: KOP to Kibby GR/Res to BSC GR to surf CND through the Dakota

Drilling Mud Type (Vertical Hole - Below Surface Casing)	Drilling Mud Type (Lateral)
Invert	Salt Water Gel

Survey Type in Vertical Portion of Well	Survey Frequency: Build Section	Survey Frequency: Lateral	Survey Contractor
MWD Every 100 Feet	30 Feet	90 Feet	Ryan

NOTE: A Gamma Ray log must be run to ground surface and a CBL must be run on intermediate or longstring casing string if set.

Surveys are required at least every 30 feet in the build section and every 90 feet in the lateral section of a horizontal well. Measurement inaccuracies are not considered when determining compliance with the spacing/drilling unit boundary setback requirement except in the following scenarios: 1) When the angle between the well bore and the respective boundary is 10 degrees or less; or 2) If Industry standard methods and equipment are not utilized. Consult the applicable field order for exceptions.

If measurement inaccuracies are required to be considered, a 2° MWD measurement inaccuracy will be applied to the horizontal portion of the well bore. This measurement inaccuracy is applied to the well bore from KOP to TD.

REQUIRED ATTACHMENTS: Certified surveyor's plat, horizontal section plat, estimated geological tops, proposed mud/cementing plan, directional plot/plan, $100 fee.

See Page 2 for Comments section and signature block.

COMMENTS, ADDITIONAL INFORMATION, AND/OR LIST OF ATTACHMENTS

Documents forwarded by email: Drill plan with drilling fluids, Well Summary with casing/cement plans, Directional Plan & Plot, Plats

Lateral 2

KOP Lateral 2 Feet MD	Azimuth Lateral 2 °	Estimated Total Depth Lateral 2 Feet MD / Feet TVD	KOP Coordinates From Well Head From WH / From WH				
Formation Entry Point Coordinates From Well Head From WH / From WH		Bottom Hole Coordinates From Well Head From WH / From WH					
KOP Footages From Nearest Section Line F L / F L		Qtr-Qtr	Section	Township N	Range W	County	
Bottom Hole Footages From Nearest Section Line F L / F L		Qtr-Qtr	Section	Township N	Range W	County	

Lateral 3

KOP Lateral 3 Feet MD	Azimuth Lateral 3 °	Estimated Total Depth Lateral 3 Feet MD / Feet TVD	KOP Coordinates From Well Head From WH / From WH				
Formation Entry Point Coordinates From Well Head From WH / From WH		Bottom Hole Coordinates From Well Head From WH / From WH					
KOP Footages From Nearest Section Line F L / F L		Qtr-Qtr	Section	Township N	Range W	County	
Bottom Hole Footages From Nearest Section Line F L / F L		Qtr-Qtr	Section	Township N	Range W	County	

Lateral 4

KOP Lateral 4 Feet MD	Azimuth Lateral 4 °	Estimated Total Depth Lateral 4 Feet MD / Feet TVD	KOP Coordinates From Well Head From WH / From WH				
Formation Entry Point Coordinates From Well Head From WH / From WH		Bottom Hole Coordinates From Well Head From WH / From WH					
KOP Footages From Nearest Section Line F L / F L		Qtr-Qtr	Section	Township N	Range W	County	
Bottom Hole Footages From Nearest Section Line F L / F L		Qtr-Qtr	Section	Township N	Range W	County	

Lateral 5

KOP Lateral 5 Feet MD	Azimuth Lateral 5 °	Estimated Total Depth Lateral 5 Feet MD / Feet TVD	KOP Coordinates From Well Head From WH / From WH				
Formation Entry Point Coordinates From Well Head From WH / From WH		Bottom Hole Coordinates From Well Head From WH / From WH					
KOP Footages From Nearest Section Line F L / F L		Qtr-Qtr	Section	Township N	Range W	County	
Bottom Hole Footages From Nearest Section Line F L / F L		Qtr-Qtr	Section	Township N	Range W	County	

I hereby swear or affirm the information provided is true, complete and correct as determined from all available records.

Date **5 / 29 / 2014**

ePermit	Printed Name **Heather McCowan**	Title **Regulatory Assistant**

FOR STATE USE ONLY

Permit and File Number **28652**	API Number **33 - 053 - 06026**
Field **BAKER**	
Pool **BAKKEN**	Permit Type **DEVELOPMENT**

FOR STATE USE ONLY

Date Approved **6 / 17 / 2014**
By **Nathaniel Erbele**
Title **Petroleum Resource Specialist**

Oil and Gas Division

Lynn D. Helms - Director Bruce E. Hicks - Assistant Director

Department of Mineral Resources

Lynn D. Helms - Director

North Dakota Industrial Commission

www.oilgas.nd.gov

April 9, 2014

RE: **Filter Socks and Other Filter Media**
Leakproof Container Required
Oil and Gas Wells

Dear Operator,

North Dakota Administrative Code Section 43-02-03-19.2 states in part that all waste material associated with exploration or production of oil and gas must be properly disposed of in an authorized facility in accord with all applicable local, state, and federal laws and regulations.

Filtration systems are commonly used during oil and gas operations in North Dakota. The Commission is very concerned about the proper disposal of used filters (including filter socks) used by the oil and gas industry.

Effective June 1, 2014, a container must be maintained on each well drilled in North Dakota beginning when the well is spud and must remain on-site during clean-out, completion, and flow-back whenever filtration operations are conducted. The on-site container must be used to store filters until they can be properly disposed of in an authorized facility. Such containers must be:

- leakproof to prevent any fluids from escaping the container
- covered to prevent precipitation from entering the container
- placard to indicate only filters are to be placed in the container

If the operator will not utilize a filtration system, a waiver to the container requirement will be considered, but only upon the operator submitting a Sundry Notice (Form 4) justifying their request.

As previously stated in our March 13, 2014 letter, North Dakota Administrative Code Section 33-20-02.1-01 states in part that every person who transports solid waste (which includes oil and gas exploration and production wastes) is required to have a valid permit issued by the North Dakota Department of Health, Division of Waste Management. Please contact the Division of Waste Management at (701) 328-5166 with any questions on the solid waste program. Note oil and gas exploration and production wastes include produced water, drilling mud, invert mud, tank bottom sediment, pipe scale, filters, and fly ash.

Thank you for your cooperation.

Sincerely,

Bruce E. Hicks

Assistant Director

600 E Boulevard Ave - Dept 405, Bismarck, North Dakota 58505-0840 Phone (701)328-8020 Fax (701)328-8022

WELL LOCATION PLAT

OASIS PETROLEUM NORTH AMERICA, LLC
1001 FANNIN, SUITE 1500, HOUSTON, TX 77002
"KLINE FEDERAL 5300 41-18 10B"
500 FEET FROM SOUTH LINE AND 237 FEET FROM WEST LINE
SECTION 18, T153N, R100W, 5th P.M., MCKENZIE COUNTY, NORTH DAKOTA

VICINITY MAP

THIS DOCUMENT WAS ORIGINALLY ISSUED AND SEALED BY ROBERT L. PROCIVE, PLS, REGISTRATION NUMBER 2884 ON 4/15/14 AND THE ORIGINAL DOCUMENTS ARE STORED AT THE OFFICES OF INTERSTATE ENGINEERING, INC.

0 1000
1" = 1000'

✚ - MONUMENT - RECOVERED
✚ - MONUMENT - NOT RECOVERED

STAKED ON 4/15/14
VERTICAL CONTROL DATUM WAS BASED UPON CONTROL POINT 4 WITH AN ELEVATION OF 2090.8'

THIS SURVEY AND PLAT IS BEING PROVIDED AT THE REQUEST OF ERIC BAYES OF OASIS PETROLEUM. I CERTIFY THAT THIS PLAT CORRECTLY REPRESENTS WORK PERFORMED BY ME OR UNDER MY SUPERVISION AND IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF.

ROBERT L. PROCIVE 2884LS

REGISTERED LAND SURVEYOR
ROBERT L. PROCIVE
LS-2884
DATE: 4/15/14
NORTH DAKOTA

Revision No.	Date	By	Description

OASIS PETROLEUM NORTH AMERICA, LLC
WELL LOCATION PLAT
SECTION 18, T153N, R100W
MCKENZIE COUNTY, NORTH DAKOTA

Drawn By: B.H.H. | Project No.: S14-09-081.04
Checked By: B.L.P. | Date: APRIL 2014

Interstate Engineering, Inc.
P.O. Box 648
425 East Main Street
Sidney, Montana 59270
Ph: (406) 433-5617
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INTERSTATE ENGINEERING

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DRILLING PLAN

OPERATOR	Oasis Petroleum	**COUNTY/STATE**	McKenzie Co., ND
WELL NAME	Kline Federal 5300 41-18 10B	**RIG**	0
WELL TYPE	Horizontal Middle Bakken		
LOCATION	SWNW 18-153N-100W Surface Location (survey plat): 500' fsl	237' fwl	
EST. T.D.	20,590'	**GROUND ELEV:**	2057 Finished Pad Elev. **Sub Height:** 25
	TOTAL LATERA 9,553'	**KB ELEV:**	2082

PROGNOSIS: Based on 2,082' KB(est)

MARKER		DEPTH (Surf Loc)	DATUM (Surf Loc)
Pierre	NDIC MAP	1,972	110
Greenhorn		4,646	(2,564)
Mowry		5,057	(2,975)
Dakota		5,471	(3,389)
Rierdon		6,486	(4,404)
Dunham Salt		6,814	(4,732)
Dunham Salt Base		6,929	(4,847)
Spearfish		7,024	(4,942)
Pine Salt		7,283	(5,201)
Pine Salt Base		7,318	(5,236)
Opeche Salt		7,374	(5,292)
Opeche Salt Base		7,403	(5,321)
Broom Creek (Top of Minnelusa Gp.)		7,605	(5,523)
Amsden		7,684	(5,602)
Tyler		7,853	(5,771)
Otter (Base of Minnelusa Gp.)		8,047	(5,965)
Kibbey Lime		8,390	(6,308)
Charles Salt		8,542	(6,460)
UB		9,159	(7,077)
Base Last Salt		9,238	(7,156)
Ratcliffe		9,301	(7,219)
Mission Canyon		9,454	(7,372)
Lodgepole		10,022	(7,940)
Lodgepole Fracture Zone		10,209	(8,127)
False Bakken		10,726	(8,644)
Upper Bakken		10,735	(8,653)
Middle Bakken		10,751	(8,669)
Middle Bakken Sand Target		10,760	(8,678)
Base Middle Bakken Sand Target		10,770	(8,688)
Lower Bakken		10,785	(8,703)
Three Forks		10,813	(8,731)

Dip Rate: -0.1

LOGS:

	Type	Interval
OH Logs:	Triple Combo KOP to Kibby (or min run of 1800' whichever is greater); GR/Res to BSC; GR to surf; CND through the Dakota	
CBL/GR:	Above top of cement/GR to base of casing	
MWD GR:	KOP to lateral TD	

DEVIATION:

Surf:	3 deg. max., 1 deg / 100'; srvy every 500'
Prod:	5 deg. max., 1 deg / 100'; srvy every 100'

DST'S: None planned

CORES: None planned

MUDLOGGING:

Two-Man: 8,342'

~200' above the Charles (Kibbey) to Casing point; Casing point to TD

30' samples at direction of wellsite geologist; 10' through target @ curve land

BOP: 11" 5000 psi blind, pipe & annular

Max. Anticipated BHP: 4673

Surface Formation: *Glacial till*

MUD:	Interval		Type	WT	Vis	WL	Remarks
Surface:	0' -	2,072'	FW/Gel - Lime Sweeps	8.4-9.0	28-32	NC	Circ Mud Tanks
Intermediate:	2,072' -	11,037'	Invert	9.5-10.4	40-50	30+HtHp	Circ Mud Tanks
Lateral:	11,037' -	20,590'	Salt Water	9.8-10.2	28-32	NC	Circ Mud Tanks

CASING:	Size	Wt ppf	Hole	Depth		Cement	WOC	Remarks
Surface:	9-5/8"	36#	13-1/2"	2,072'		To Surface	12	100' into Pierre
Intermediate:	7"	29/32#	8-3/4"	11,037'		3971	24	1500' above Dakota
Production Liner:	4.5"	11.6#	6"	20,590'	**TOL @ 10,238'**			50' above KOP

PROBABLE PLUGS, IF REQ'D:

OTHER:

	MD	TVD	FNL/FSL	FEL/FWL	S-T-R	AZI
Surface:	2,072	2,072	500' FSL	237' FWL	SEC 18-T153N-R100W	Survey Company:
KOP:	10,288'	10,288'	514' FSL	285' FWL	SEC 18-T153N-R100W	Build Rate: 12 deg /100'
EOC:	11,037'	10,765'	643' FSL	744' FWL	SEC 18-T153N-R100W	
Casing Point:	11,037'	10,765'	643' FSL	744' FWL	SEC 18-T153N-R100W	
Middle Bakken Lateral TD:	20,590'	10,782'	750' FSL	200' FEL	SEC 17-T153N-R100W	

Comments:

Request a Sundry for an Open Hole Log Waiver

Exception well: Oasis Petroleum's Kline Federal 5300 11-18H (153N 100W 18 NW NW)

35 packers, 35 sleeves, no frac string

Oasis Petroleum does not use Diesel Fuel, as defined by the US EPA in the list below, in our hydraulic fracture operations.
68334-30-5 (Primary Name: Fuels, diesel) 68476-34-6 (Primary Name: Fuels, diesel, No. 2)68476-30-2 (Primary Name: Fuel oil No. 2)
68476-31-3 (Primary Name: Fuel oil, No. 4)8008-20-6 (Primary Name: Kerosene)

OASIS PETROLEUM

Geology: M. Steed 4/3/2014 **Engineering:** hbader rpm

Oasis Petroleum
Well Summary
Kline Federal 5300 41-18 10B
Section 18 T153N R100W
McKenzie County, ND

SURFACE CASING AND CEMENT DESIGN

							Make-up Torque (ft-lbs)		
Size	**Interval**	**Weight**	**Grade**	**Coupling**	**I.D.**	**Drift**	**Minimum**	**Optimum**	**Max**
9-5/8”	0’ to 2,072’	36	J-55	LTC	8.921"	8.765"	3400	4530	5660

Interval	Description	Collapse	Burst	Tension	Cost per ft
		(psi) a	(psi) b	(1000 lbs) c	
0’ to 2,072’	9-5/8", 36#, J-55, LTC, 8rd	2020 / 2.08	3520 / 3.63	453 / 2.76	

API Rating & Safety Factor

a) Based on full casing evacuation with 9 ppg fluid on backside (2,072' setting depth).

b) Burst pressure based on 9 ppg fluid with no fluid on backside (2,072' setting depth).

c) Based on string weight in 9 ppg fluid at 2,072' TVD plus 100k# overpull. (Buoyed weight equals 64k lbs.)

Cement volumes are based on 9-5/8" casing set in 13-1/2" hole with 60% excess to circulate cement back to surface. Mix and pump the following slurry.

Pre-flush (Spacer): **20 bbls** fresh water

Lead Slurry: **449 sks** (232 bbls) Conventional system with 94 lb/sk cement, 4% extender, 2% expanding agent, 2% $CaCl_2$ and 0.25 lb/sk lost circulation control agent

Tail Slurry: **300 sks** (62 bbls) Conventional system with 94 lb/sk cement, 3% NaCl, and 0.25 lb/sk lost circulation control agent

Oasis Petroleum
Well Summary
Kline Federal 5300 41-18 10B
Section 18 T153N R100W
McKenzie County, ND

INTERMEDIATE CASING AND CEMENT DESIGN

							Make-up Torque (ft-lbs)		
Size	**Interval**	**Weight**	**Grade**	**Coupling**	**I.D.**	**Drift**	**Minimum**	**Optimum**	**Max**
7”	0' – 6,614'	29	P-110	LTC	6.184”	6.059”	5,980	7,970	8,770
7”	6,614' – 10,288'	32	HCP-110	LTC	6.094”	6.000***	6,730	8,970	9,870
7”	10,288' – 11,037'	29	P-110	LTC	6.184”	6.059”	5,980	7,970	8,770

***Special drift

Interval	Length	Description	Collapse	Burst	Tension
			(psi) a	(psi) b	(1000 lbs) c
0' – 6,614'	6,614’	7”, 29#, P-110, LTC, 8rd	8530 / 2.48*	11220 / 1.19	797 / 2.10
6,614' – 10,288'	3,674’	7”, 32#, HCP-110, LTC, 8rd	11820 / 2.21*	12460 / 1.29	
6,614' – 10,288'	3,674’	7”, 32#, HCP-110, LTC, 8rd	11820 / 1.07**	12460 / 1.29	
10,288' – 11,037'	749’	7”, 29 lb, P-110, LTC, 8rd	8530 / 1.53*	11220 / 1.16	

API Rating & Safety Factor

a) *Assume full casing evacuation with 10 ppg fluid on backside
**Assume full casing evacuation with 1.2 psi/ft equivalent fluid gradient across salt intervals. (Bottom of last salt 9,238’ TVD)

b) Burst pressure based on 9000 psig max press for stimulation plus 10.2 ppg fluid in casing and 9 ppg fluid on backside-to 10,765' TVD.

c) Based on string weight in 10 ppg fluid, (280k lbs buoyed weight) plus 100k

Cement volumes are estimates based on 7" casing set in an 8-3/4" hole with 30% excess.

Pre-flush (Spacer): **170 bbls** Saltwater
20 bbls CW8 System
10 bbls Fresh Water

Lead Slurry: **177 sks** (82 bbls) Conventional system with 47 lb/sk cement, 10% NaCl, 34 lb/sk extender, 10% D020 extender, 1% D079 extender, 1% anti-settling agent, 1% fluid loss agent, 0.2% anti-foam agent, 0.7% retarder, 0.125 lb/sk lost circulation control agent, and 0.3% dispersant

Tail Slurry: **575 sks** (168 bbls) Conventional system with 94 lb/sk cement, 10% NaCl, 35% Silica, 0.2% fluid loss agent, 0.8% dispersant, 0.125 lb/sk lost circulation control agent and 0.3% retarder

Oasis Petroleum
Well Summary
Kline Federal 5300 41-18 10B
Section 18 T153N R100W
McKenzie County, ND

PRODUCTION LINER

							Make-up Torque (ft-lbs)		
Size	**Interval**	**Weight**	**Grade**	**Coupling**	**I.D.**	**Drift**	**Minimum**	**Optimum**	**Max**
4-1/2”	10,238' – 20,590'	11.6	P-110	BTC	4.000"	3.875"			

Interval	Description	Collapse	Burst	Tension	Cost per ft
		(psi) **a**	(psi) **b**	(1000 lbs) **c**	
10,238' – 20,590'	4-1/2”, 11.6 lb, P-110, BTC, 8rd	7560 / 1.42	10690 / 1.11	385 / 1.90	

API Rating & Safety Factor

a) Based on full casing evacuation with 9.5 ppg fluid on backside @ 10,765' TVD.

b) Burst pressure based on 9000 psi treating pressure with 10.2 ppg internal fluid gradient and 9 ppg external fluid gradient @ 10,765' TVD.

c) Based on string weight in 9.5 ppg fluid (Buoyed weight: 102k lbs.) plus 100k lbs overpull.

Oasis Petroleum

Indian Hills
153N-100W-17/18
Kline Federal 5300 41-18 10B

Kline Federal 5300 41-18 10B

Plan: Design #1

Standard Planning Report

23 May, 2014

RYAN DIRECTIONAL SERVICES
A NABORS COMPANY

Project: Indian Hills
Site: 153N-100W-17/18
Well: Kline Federal 5300 41-18 10B
Wellbore: Kline Federal 5300 41-18 10B
Design: Design #1

OASIS PETROLEUM

WELL DETAILS: Kline Federal 5300 41-18 10B

Ground Level: 2057.0

Northing	Easting	Latitude	Longitude
405202.44	1209970.87	48° 4' 8.200 N	103° 36' 11.950 W

CASING DETAILS

TVD	MD	Name	Size
10765.0	11037.0	7"	7

Azimuths to True North
Magnetic North: 8.27°

Magnetic Field
Strength: 56438.3snT
Dip Angle: 72.99°
Date: 5/19/2014
Model: IGRF2010

SECTION DETAILS

MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	Target
0.0	0.00	0.00	0.0	0.0	0.0	0.00	
2200.0	0.00	0.00	2200.0	0.0	0.0	0.00	
2216.7	0.50	74.25	2216.7	0.0	0.1	3.00	
7926.7	0.50	74.25	7926.4	13.5	48.0	0.00	
7943.3	0.00	0.00	7943.1	13.6	48.1	3.00	
10287.8	0.00	0.00	10287.6	13.6	48.1	0.00	
11037.0	89.90	74.25	10765.0	142.9	506.8	12.00	
11824.6	89.90	90.00	10766.4	250.5	1284.6	2.00	
20590.0	89.90	90.00	10781.7	250.0	10050.0	0.00	5300 41-18 10B PBHL

Database:	789$/111:3$;"!#Ä&$<=&)$8>	**Local Co-ordinate Reference:**	+ &ÄÄ$,Ä"!&$-&.&)Ā$!$23435$316
Company:	E ="=$Ā&*)(Ä&BH	**TVD Reference:**	+7?? $@$A15A:1B=C*$DE)"#"!&$ĀA7Ä&FG
Project:	!!." !$J"ÄÄ=	**MD Reference:**	+7?? $@$A15A:1B=C*$DE)"#"!&$ĀA7Ä&FG
Site:	3/0L4311+43MN35	**North Reference:**	K)B&
Well:	,Ä"!&$-&.&) Ā$/011$23435$316	**Survey Calculation Method:**	9"!"HBH$OB)F *B)&
Wellbore:	,Ä"!&$-&.&) Ā$/011$23435$316		
Design:	8&="#!$P3		

Project !!." !$J"ÄÄ=

Map System:	<;$;* *&$ĀÄ !&$3Q50	**System Datum:**	9& !$;& $?&F&Ä
Geo Datum:	L()*R$SH&)"T !$8 *BH$3Q50		
Map Zone:	L()*R$8 U(* $L()*R&)!$V(!&		

Site 3/0L4311+43MN35

Site Position:		**Northing:**	215ZQXA:22$B=C*	**Latitude:**	25W$2[$2/:051$L
From:	? *N?(!#	**Easting:**	3ZA31ZAAQ:35$B=C*	**Longitude:**	310W$0X[$31:051$+
Position Uncertainty:	1:1$B=C*	**Slot Radius:**	3040N3X$Y	**Grid Convergence:**	4A:03$W

Well ,Ä"!&$-&.&) Ā$/011$23435$316

Well Position	**+N/-S**	40ZMXM:2$B=C*	**Northing:**	21/ZA1A:22$B=C*	**Latitude:**	25W$2[$5:A11$L
	+E/-W	431X:X$B=C*	**Easting:**	3ZA1QZQM1:5M$B=C*	**Longitude:**	310W$0X[$0:Q/1$+
Position Uncertainty		A:1$B=C*	**Wellhead Elevation:**		**Ground Level:**	AZ1/M:1$B=C*

Wellbore ,Ä"!&$-&.&) Ā$/011$23435$316

Magnetics	**Model Name**	**Sample Date**	**Declination (°)**	**Dip Angle (°)**	**Field Strength (nT)**
	I\%-A131	/N3QNA132	5:AM	MA:QQ	/XZ205

Design 8&="#!$P3

Audit Notes:

Version:		**Phase:**	Ā%EKEK]Ā7	**Tie On Depth:**	1:1

Vertical Section:	**Depth From (TVD) (usft)**	**+N/-S (usft)**	**+E/-W (usft)**	**Direction (°)**
	1:1	1:1	1:1	Q1:11

Plan Sections

Measured Depth (usft)	**Inclination (°)**	**Azimuth (°)**	**Vertical Depth (usft)**	**+N/-S (usft)**	**+E/-W (usft)**	**Dogleg Rate (°/100usft)**	**Build Rate (°/100usft)**	**Turn Rate (°/100usft)**	**TFO (°)**	**Target**
1:1	1:11	1:11	1:1	1:1	1:1	1:11	1:11	1:11	1:11	
AZA11:1	1:11	1:11	AZA11:1	1:1	1:1	1:11	1:11	1:11	1:11	
AZA3X:M	1:/1	M2:A/	AZA3X:M	1:1	1:3	0:11	0:11	1:11	M2:A/	
MZQAX:M	1:/1	M2:A/	MZQAX:2	30:/	25:1	1:11	1:11	1:11	1:11	
MZQ20:0	1:11	1:11	MZQ20:3	30:X	25:3	0:11	40:11	1:11	351:11	
31ZA5M:5	1:11	1:11	31ZA5M:X	30:X	25:3	1:11	1:11	1:11	1:11	
33Z10M:1	5Q:Q1	M2:A/	31ZMX/:1	32A:Q	/1X:5	3A:11	3A:11	1:11	M2:A/	
33Z5A2:X	5Q:Q1	Q1:11	31ZMXX:2	A/1:/	3ZA52:X	A:11	1:11	A:11	Q1:13	
A1Z/Q1:1	5Q:Q1	Q1:11	31ZM53:M	A/1:1	31Z1/1:1	1:11	1:11	1:11	1:11	/011$23435$316$Ā6J

Database:	789$/111:3$;"!#Ä&$<=&)$8>	**Local Co-ordinate Reference:**	+ &ÄÄ$,Ä"!&$-&.&)Ä$!$23435$316
Company:	E ="=$Ā&*)(Ä&BH	**TVD Reference:**	+7?? $@$A15A:1B=C*$DE)"#"!&$ĀA7Ä&FG
Project:	!!." !$J"ÄÄ=	**MD Reference:**	+7?? $@$A15A:1B=C*$DE)"#"!&$ĀA7Ä&FG
Site:	3/0L4311+43MN35	**North Reference:**	K)B&
Well:	,Ä"!&$-&.&) Ä$/011$23435$316	**Survey Calculation Method:**	9"!"HBH$OB)F *B)&
Wellbore:	,Ä"!&$-&.&) Ä$/011$23435$316		
Design:	8&="#!$P3		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
AZA11:1	1:11	1:11	AZA11:1	1:1	1:1	1:1	1:11	1:11	1:11
AZA3X:M	1:/1	M2:A/	AZA3X:M	1:1	1:3	1:3	0:11	0:11	1:11
AZ011:1	1:/1	M2:A/	AZ011:1	1:A	1:5	1:5	1:11	1:11	1:11
AZ211:1	1:/1	M2:A/	AZ211:1	1:/	3:X	3:X	1:11	1:11	1:11
AZ/11:1	1:/1	M2:A/	AZ/11:1	1:M	A:2	A:2	1:11	1:11	1:11
AZX11:1	1:/1	M2:A/	AZX11:1	1:Q	0:0	0:0	1:11	1:11	1:11
AZM11:1	1:/1	M2:A/	AZM11:1	3:A	2:3	2:3	1:11	1:11	1:11
AZ511:1	1:/1	M2:A/	AZ511:1	3:2	/:1	/:1	1:11	1:11	1:11
AZQ11:1	1:/1	M2:A/	AZQ11:1	3:X	/:5	/:5	1:11	1:11	1:11
0Z111:1	1:/1	M2:A/	0Z111:1	3:Q	X:X	X:X	1:11	1:11	1:11
0Z311:1	1:/1	M2:A/	0Z311:1	A:3	M:/	M:/	1:11	1:11	1:11
0ZA11:1	1:/1	M2:A/	0ZA11:1	A:0	5:0	5:0	1:11	1:11	1:11
0Z011:1	1:/1	M2:A/	0Z011:1	A:X	Q:A	Q:A	1:11	1:11	1:11
0Z211:1	1:/1	M2:A/	0Z211:1	A:5	31:1	31:1	1:11	1:11	1:11
0Z/11:1	1:/1	M2:A/	0Z/11:1	0:3	31:5	31:5	1:11	1:11	1:11
0ZX11:1	1:/1	M2:A/	0Z/QQ:Q	0:0	33:M	33:M	1:11	1:11	1:11
0ZM11:1	1:/1	M2:A/	0ZXQQ:Q	0:/	3A:/	3A:/	1:11	1:11	1:11
0Z511:1	1:/1	M2:A/	0ZMQQ:Q	0:5	30:2	30:2	1:11	1:11	1:11
0ZQ11:1	1:/1	M2:A/	0Z5QQ:Q	2:1	32:A	32:A	1:11	1:11	1:11
2Z111:1	1:/1	M2:A/	0ZQQQ:Q	2:A	3/:1	3/:1	1:11	1:11	1:11
2Z311:1	1:/1	M2:A/	2Z1QQ:Q	2:/	3/:Q	3/:Q	1:11	1:11	1:11
2ZA11:1	1:/1	M2:A/	2Z3QQ:Q	2:M	3X:M	3X:M	1:11	1:11	1:11
2Z011:1	1:/1	M2:A/	2ZAQQ:Q	/:1	3M:X	3M:X	1:11	1:11	1:11
2Z211:1	1:/1	M2:A/	2Z0QQ:Q	/:A	35:2	35:2	1:11	1:11	1:11
2Z/11:1	1:/1	M2:A/	2Z2QQ:Q	/:2	3Q:A	3Q:A	1:11	1:11	1:11
2ZX11:1	1:/1	M2:A/	2Z/QQ:Q	/:M	A1:3	A1:3	1:11	1:11	1:11
2ZX2X:3	1:/1	M2:A/	2ZX2X:1	/:5	A1:/	A1:/	1:11	1:11	1:11
Greenhorn									
2ZM11:1	1:/1	M2:A/	2ZXQQ:Q	/:Q	A1:Q	A1:Q	1:11	1:11	1:11
2Z511:1	1:/1	M2:A/	2ZMQQ:Q	X:3	A3:5	A3:5	1:11	1:11	1:11
2ZQ11:1	1:/1	M2:A/	2Z5QQ:Q	X:2	AA:X	AA:X	1:11	1:11	1:11
/Z111:1	1:/1	M2:A/	2ZQQQ:Q	X:X	A0:2	A0:2	1:11	1:11	1:11
/Z1/M:3	1:/1	M2:A/	/Z1/M:1	X:M	A0:Q	A0:Q	1:11	1:11	1:11
Mowry									
/Z311:1	1:/1	M2:A/	/Z1QQ:Q	X:5	A2:0	A2:0	1:11	1:11	1:11
/ZA11:1	1:/1	M2:A/	/Z3QQ:Q	M:3	A/:3	A/:3	1:11	1:11	1:11
/Z011:1	1:/1	M2:A/	/ZAQQ:Q	M:0	AX:1	AX:1	1:11	1:11	1:11
/Z211:1	1:/1	M2:A/	/Z0QQ:Q	M:X	AX:5	AX:5	1:11	1:11	1:11
/Z2M3:3	1:/1	M2:A/	/Z2M3:1	M:M	AM:2	AM:2	1:11	1:11	1:11
Dakota									
/Z/11:1	1:/1	M2:A/	/Z2QQ:Q	M:5	AM:X	AM:X	1:11	1:11	1:11
/ZX11:1	1:/1	M2:A/	/Z/QQ:Q	5:1	A5:/	A5:/	1:11	1:11	1:11
/ZM11:1	1:/1	M2:A/	/ZXQQ:Q	5:0	AQ:0	AQ:0	1:11	1:11	1:11
/Z511:1	1:/1	M2:A/	/ZMQQ:Q	5:/	01:A	01:A	1:11	1:11	1:11
/ZQ11:1	1:/1	M2:A/	/Z5QQ:Q	5:M	03:1	03:1	1:11	1:11	1:11
XZ111:1	1:/1	M2:A/	/ZQQQ:Q	Q:1	03:5	03:5	1:11	1:11	1:11
XZ311:1	1:/1	M2:A/	XZ1QQ:Q	Q:A	0A:M	0A:M	1:11	1:11	1:11
XZA11:1	1:/1	M2:A/	XZ3QQ:5	Q:/	00:/	00:/	1:11	1:11	1:11
XZ011:1	1:/1	M2:A/	XZAQQ:5	Q:M	02:2	02:2	1:11	1:11	1:11
XZ211:1	1:/1	M2:A/	XZ0QQ:5	Q:Q	0/:A	0/:A	1:11	1:11	1:11
XZ25X:A	1:/1	M2:A/	XZ25X:1	31:3	0/:Q	0/:Q	1:11	1:11	1:11
Rierdon									
XZ/11:1	1:/1	M2:A/	XZ2QQ:5	31:A	0X:1	0X:1	1:11	1:11	1:11

Database:	789$/111:3$;"!#Ä&$<=&)$8>	**Local Co-ordinate Reference:**	+ &ÄÄ$,Ä"!&$-&.&)Ä$!$23435$316
Company:	E ="=$Ā&*)(Ä&BH	**TVD Reference:**	+7?? $@$A15A:1B=C*$DE)"#"!&$Ā$7Ä&FG
Project:	!!." !$J"ÄÄ=	**MD Reference:**	+7?? $@$A15A:1B=C*$DE)"#"!&$Ā$7Ä&FG
Site:	3/0L4311+43MN35	**North Reference:**	K)B&
Well:	,Ä"!&$-&.&) Ä$/011$23435$316	**Survey Calculation Method:**	9"!"HBH$OB)F *B)&
Wellbore:	,Ä"!&$-&.&) Ä$/011$23435$316		
Design:	8&="#!$P3		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
XZX11:1	1:/1	M2:A/	XZ/QQ:5	31:2	0X:Q	0X:Q	1:11	1:11	1:11
XZM11:1	1:/1	M2:A/	XZXQQ:5	31:X	0M:M	0M:M	1:11	1:11	1:11
XZ511:1	1:/1	M2:A/	XZMQQ:5	31:Q	05:X	05:X	1:11	1:11	1:11
XZ532:A	1:/1	M2:A/	XZ532:1	31:Q	05:M	05:M	1:11	1:11	1:11
Dunham Salt									
XZQ11:1	1:/1	M2:A/	XZ5QQ:5	33:3	0Q:2	0Q:2	1:11	1:11	1:11
XZQAQ:A	1:/1	M2:A/	XZQAQ:1	33:A	0Q:X	0Q:X	1:11	1:11	1:11
Dunham Salt Base									
MZ111:1	1:/1	M2:A/	XZQQQ:5	33:2	21:A	21:A	1:11	1:11	1:11
MZ1A2:A	1:/1	M2:A/	MZ1A2:1	33:2	21:2	21:2	1:11	1:11	1:11
Spearfish									
MZ311:1	1:/1	M2:A/	MZ1QQ:5	33:X	23:3	23:3	1:11	1:11	1:11
MZA11:1	1:/1	M2:A/	MZ3QQ:5	33:5	23:Q	23:Q	1:11	1:11	1:11
MZA50:A	1:/1	M2:A/	MZA50:1	3A:1	2A:X	2A:X	1:11	1:11	1:11
Pine Salt									
MZ011:1	1:/1	M2:A/	MZAQQ:5	3A:3	2A:5	2A:5	1:11	1:11	1:11
MZ035:A	1:/1	M2:A/	MZ035:1	3A:3	2A:Q	2A:Q	1:11	1:11	1:11
Pine Salt Base									
MZ0M2:A	1:/1	M2:A/	MZ0M2:1	3A:A	20:2	20:2	1:11	1:11	1:11
Opeche Salt									
MZ211:1	1:/1	M2:A/	MZ0QQ:5	3A:0	20:X	20:X	1:11	1:11	1:11
MZ210:A	1:/1	M2:A/	MZ210:1	3A:0	20:X	20:X	1:11	1:11	1:11
Opeche Salt Base									
MZ/11:1	1:/1	M2:A/	MZ2QQ:5	3A:/	22:2	22:2	1:11	1:11	1:11
MZX11:1	1:/1	M2:A/	MZ/QQ:5	3A:5	2/:0	2/:0	1:11	1:11	1:11
MZX1/:A	1:/1	M2:A/	MZX1/:1	3A:5	2/:0	2/:0	1:11	1:11	1:11
Broom Creek (Top of Minnelusa Gp.)									
MZX52:A	1:/1	M2:A/	MZX52:1	30:1	2X:1	2X:1	1:11	1:11	1:11
Amsden									
MZM11:1	1:/1	M2:A/	MZXQQ:5	30:1	2X:3	2X:3	1:11	1:11	1:11
MZ511:1	1:/1	M2:A/	MZMQQ:5	30:A	2M:1	2M:1	1:11	1:11	1:11
MZ5/0:A	1:/1	M2:A/	MZ5/0:1	30:2	2M:2	2M:2	1:11	1:11	1:11
Tyler									
MZQ11:1	1:/1	M2:A/	MZ5QQ:5	30:/	2M:5	2M:5	1:11	1:11	1:11
MZQAX:M	1:/1	M2:A/	MZQAX:2	30:/	25:1	25:1	1:11	1:11	1:11
MZQ20:0	1:11	1:11	MZQ20:3	30:X	25:3	25:3	0:11	40:11	1:11
5Z111:1	1:11	1:11	MZQQQ:5	30:X	25:3	25:3	1:11	1:11	1:11
5Z12M:A	1:11	1:11	5Z12M:1	30:X	25:3	25:3	1:11	1:11	1:11
Otter (Base of Minnelusa Gp.)									
5Z311:1	1:11	1:11	5Z1QQ:5	30:X	25:3	25:3	1:11	1:11	1:11
5ZA11:1	1:11	1:11	5Z3QQ:5	30:X	25:3	25:3	1:11	1:11	1:11
5Z011:1	1:11	1:11	5ZAQQ:5	30:X	25:3	25:3	1:11	1:11	1:11
5Z0Q1:A	1:11	1:11	5Z0Q1:1	30:X	25:3	25:3	1:11	1:11	1:11
Kibbey Lime									
5Z211:1	1:11	1:11	5Z0QQ:5	30:X	25:3	25:3	1:11	1:11	1:11
5Z/11:1	1:11	1:11	5Z2QQ:5	30:X	25:3	25:3	1:11	1:11	1:11
5Z/2A:A	1:11	1:11	5Z/2A:1	30:X	25:3	25:3	1:11	1:11	1:11
Charles Salt									
5ZX11:1	1:11	1:11	5Z/QQ:5	30:X	25:3	25:3	1:11	1:11	1:11
5ZM11:1	1:11	1:11	5ZXQQ:5	30:X	25:3	25:3	1:11	1:11	1:11
5Z511:1	1:11	1:11	5ZMQQ:5	30:X	25:3	25:3	1:11	1:11	1:11
5ZQ11:1	1:11	1:11	5Z5QQ:5	30:X	25:3	25:3	1:11	1:11	1:11

Database:	789$/111:3$;"!#Ä&$<=&)$8>	**Local Co-ordinate Reference:**	+ &ÄÄ$,Ä"!&$-&.&)Ä$!$23435$316
Company:	E ="=$Ā&*)(Ä&BH	**TVD Reference:**	+7?? $@$A15A:1B=C*$DE)"#"!&$Ä$7Ä&FG
Project:	!!." !$J"ÄÄ=	**MD Reference:**	+7?? $@$A15A:1B=C*$DE)"#"!&$Ä$7Ä&FG
Site:	3/0L4311+43MN35	**North Reference:**	K)B&
Well:	,Ä"!&$-&.&) Ä$/011$23435$316	**Survey Calculation Method:**	9"!"HBH$OB)F *B)&
Wellbore:	,Ä"!&$-&.&) Ä$/011$23435$316		
Design:	8&="#!$P3		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
QZ111:1	1:11	1:11	5ZQQQ:5	30:X	25:3	25:3	1:11	1:11	1:11
QZ311:1	1:11	1:11	QZ1QQ:5	30:X	25:3	25:3	1:11	1:11	1:11
QZ3/Q:A	1:11	1:11	QZ3/Q:1	30:X	25:3	25:3	1:11	1:11	1:11
UB									
QZA11:1	1:11	1:11	QZ3QQ:5	30:X	25:3	25:3	1:11	1:11	1:11
QZA05:A	1:11	1:11	QZA05:1	30:X	25:3	25:3	1:11	1:11	1:11
Base Last Salt									
QZ011:1	1:11	1:11	QZAQQ:5	30:X	25:3	25:3	1:11	1:11	1:11
QZ013:A	1:11	1:11	QZ013:1	30:X	25:3	25:3	1:11	1:11	1:11
Ratcliffe									
QZ211:1	1:11	1:11	QZ0QQ:5	30:X	25:3	25:3	1:11	1:11	1:11
QZ2/2:A	1:11	1:11	QZ2/2:1	30:X	25:3	25:3	1:11	1:11	1:11
Mission Canyon									
QZ/11:1	1:11	1:11	QZ2QQ:5	30:X	25:3	25:3	1:11	1:11	1:11
QZX11:1	1:11	1:11	QZ/QQ:5	30:X	25:3	25:3	1:11	1:11	1:11
QZM11:1	1:11	1:11	QZXQQ:5	30:X	25:3	25:3	1:11	1:11	1:11
QZ511:1	1:11	1:11	QZMQQ:5	30:X	25:3	25:3	1:11	1:11	1:11
QZQ11:1	1:11	1:11	QZ5QQ:5	30:X	25:3	25:3	1:11	1:11	1:11
31Z111:1	1:11	1:11	QZQQQ:5	30:X	25:3	25:3	1:11	1:11	1:11
31Z1AA:A	1:11	1:11	31Z1AA:1	30:X	25:3	25:3	1:11	1:11	1:11
Lodgepole									
31Z311:1	1:11	1:11	31Z1QQ:5	30:X	25:3	25:3	1:11	1:11	1:11
31ZA11:1	1:11	1:11	31Z3QQ:5	30:X	25:3	25:3	1:11	1:11	1:11
31ZA1Q:A	1:11	1:11	31ZA1Q:1	30:X	25:3	25:3	1:11	1:11	1:11
Lodgepole Fracture Zone									
31ZA5M:5	1:11	1:11	31ZA5M:X	30:X	25:3	25:3	1:11	1:11	1:11
KOP Build 12°/100'									
31Z011:1	3:2X	M2:A/	31ZAQQ:5	30:X	25:A	25:A	3A:11	3A:11	1:11
31Z0A/:1	2:2X	M2:A/	31Z0A2:M	32:1	2Q:/	2Q:/	3A:11	3A:11	1:11
31Z0/1:1	M:2X	M2:A/	31Z02Q:X	32:M	/A:1	/A:1	3A:11	3A:11	1:11
31Z0M/:1	31:2X	M2:A/	31Z0M2:0	3/:M	//:M	//:M	3A:11	3A:11	1:11
31Z211:1	30:2X	M2:A/	31Z0Q5:5	3M:3	X1:M	X1:M	3A:11	3A:11	1:11
31Z2A/:1	3X:2X	M2:A/	31Z2AA:Q	35:Q	XX:Q	XX:Q	3A:11	3A:11	1:11
31Z2/1:1	3Q:2X	M2:A/	31Z22X:M	A3:1	M2:2	M2:2	3A:11	3A:11	1:11
31Z2M/:1	AA:2X	M2:A/	31Z2M1:1	A0:2	50:1	50:1	3A:11	3A:11	1:11
31Z/11:1	A/:2X	M2:A/	31Z2QA:Q	AX:A	QA:M	QA:M	3A:11	3A:11	1:11
31Z/A/:1	A5:2X	M2:A/	31Z/3/:3	AQ:A	310:X	310:X	3A:11	3A:11	1:11
31Z//1:1	03:2X	M2:A/	31Z/0X:5	0A:X	33/:M	33/:M	3A:11	3A:11	1:11
31Z/M/:1	02:2X	M2:A/	31Z//M:5	0X:0	3A5:5	3A5:5	3A:11	3A:11	1:11
31ZX11:1	0M:2X	M2:A/	31Z/M5:1	21:0	32A:Q	32A:Q	3A:11	3A:11	1:11
31ZXA/:1	21:2X	M2:A/	31Z/QM:2	22:X	3/5:1	3/5:1	3A:11	3A:11	1:11
31ZX/1:1	20:2X	M2:A/	31ZX3X:1	2Q:3	3M2:3	3M2:3	3A:11	3A:11	1:11
31ZXM/:1	2X:2X	M2:A/	31ZX00:M	/0:Q	3Q3:3	3Q3:3	3A:11	3A:11	1:11
31ZM11:1	2Q:2X	M2:A/	31ZX/1:/	/5:Q	A1Q:1	A1Q:1	3A:11	3A:11	1:11
31ZMA/:1	/A:2X	M2:A/	31ZXXX:A	X2:A	AAM:M	AAM:M	3A:11	3A:11	1:11
31ZM/1:1	//:2X	M2:A/	31ZX51:Q	XQ:M	A2M:3	A2M:3	3A:11	3A:11	1:11
31ZMM/:1	/5:2X	M2:A/	31ZXQ2:/	M/:2	AXM:0	AXM:0	3A:11	3A:11	1:11
31Z511:1	X3:2X	M2:A/	31ZM1M:1	53:0	A55:3	A55:3	3A:11	3A:11	1:11
31Z5A/:1	X2:2X	M2:A/	31ZM35:2	5M:0	01Q:/	01Q:/	3A:11	3A:11	1:11
31Z520:2	XX:XM	M2:A/	31ZMAX:1	Q3:5	0A/:X	0A/:X	3A:11	3A:11	1:11
False Bakken									
31Z5/1:1	XM:2X	M2:A/	31ZMA5:X	Q0:/	003:/	003:/	3A:11	3A:11	1:11
31Z5XM:/	XQ:/M	M2:A/	31ZM0/:1	QM:Q	02M:A	02M:A	3A:11	3A:11	1:11

Database:	789$/111:3$;"!#Ä&$<=&)$8>	**Local Co-ordinate Reference:**	+ &ÄÄ$,Ä"!&$-&.&)Ä$!$23435$316
Company:	E ="=$Ā&*)(Ä&BH	**TVD Reference:**	+7?? $@$A15A:1B=C*$DE)"#"!&ÄÄ$7Ä&FG
Project:	!!." !$J"ÄÄ=	**MD Reference:**	+7?? $@$A15A:1B=C*$DE)"#"!&ÄÄ$7Ä&FG
Site:	3/0L4311+43MN35	**North Reference:**	K)B&
Well:	,Ä"!&$-&.&) Ā$/011$23435$316	**Survey Calculation Method:**	9"!"HBH$OB)F *B)&
Wellbore:	,Ä"!&$-&.&) Ā$/011$23435$316		
Design:	8&="#!$P3		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
Upper Bakken									
31Z5M/:1	M1:2X	M2:A/	31ZM0M:X	QQ:5	0/2:1	0/2:1	3A:11	3A:11	1:11
31ZQ11:1	M0:2X	M2:A/	31ZM2/:0	31X:0	0MX:5	0MX:5	3A:11	3A:11	1:11
31ZQA3:M	MX:1M	M2:A/	31ZM/3:1	33A:1	0QM:1	0QM:1	3A:11	3A:11	1:11
Middle Bakken									
31ZQA/:1	MX:2X	M2:A/	31ZM/3:5	33A:5	211:3	211:3	3A:11	3A:11	1:11
31ZQ/1:1	MQ:2X	M2:A/	31ZM/M:1	33Q:/	2A0:X	2A0:X	3A:11	3A:11	1:11
31ZQX5:0	53:XX	M2:A/	31ZMX1:1	3A2:2	223:1	223:1	3A:11	3A:11	1:11
Middle Bakken Sand Target									
31ZQM/:1	5A:2X	M2:A/	31ZMX1:Q	3AX:A	22M:2	22M:2	3A:11	3A:11	1:11
33Z111:1	5/:2X	M2:A/	31ZMX0:X	30A:Q	2M3:0	2M3:0	3A:11	3A:11	1:11
33Z1A/:1	55:2X	M2:A/	31ZMX2:Q	30Q:M	2Q/:0	2Q/:0	3A:11	3A:11	1:11
33Z10M:1	5Q:Q1	M2:A/	31ZMX/:1	320:1	/1X:Q	/1X:Q	33:QM	33:QM	1:11
EOC - 7"									
33Z311:1	5Q:Q1	M/:/3	31ZMX/:A	3/Q:2	/XM:M	/XM:M	A:11	1:11	A:11
33ZA11:1	5Q:Q1	MM:/3	31ZMX/:0	35A:M	XX2:Q	XX2:Q	A:11	1:11	A:11
33Z011:1	5Q:Q1	MQ:/3	31ZMX/:/	A1A:X	MXA:Q	MXA:Q	A:11	1:11	A:11
33Z211:1	5Q:Q1	53:/3	31ZMX/:M	A3Q:3	5X3:/	5X3:/	A:11	1:11	A:11
33Z/11:1	5Q:Q1	50:/3	31ZMX/:Q	A0A:3	QX1:M	QX1:M	A:11	1:11	A:11
33ZX11:1	5Q:Q1	5/:/3	31ZMXX:1	A23:M	3Z1X1:A	3Z1X1:A	A:11	1:11	A:11
33ZM11:1	5Q:Q1	5M:/3	31ZMXX:A	A2M:5	3Z3X1:1	3Z3X1:1	A:11	1:11	A:11
33Z511:1	5Q:Q1	5Q:/3	31ZMXX:2	A/1:2	3ZAX1:1	3ZAX1:1	A:11	1:11	A:11
33Z5A2:X	5Q:Q1	Q1:11	31ZMXX:2	A/1:/	3ZA52:X	3ZA52:X	A:11	1:11	A:11
33ZQ11:1	5Q:Q1	Q1:11	31ZMXX:X	A/1:/	3Z0X1:1	3Z0X1:1	1:11	1:11	1:11
3AZ111:1	5Q:Q1	Q1:11	31ZMXX:M	A/1:/	3Z2X1:1	3Z2X1:1	1:11	1:11	1:11
3AZ311:1	5Q:Q1	Q1:11	31ZMXX:Q	A/1:/	3Z/X1:1	3Z/X1:1	1:11	1:11	1:11
3AZA11:1	5Q:Q1	Q1:11	31ZMXM:3	A/1:/	3ZXX1:1	3ZXX1:1	1:11	1:11	1:11
3AZ011:1	5Q:Q1	Q1:11	31ZMXM:0	A/1:/	3ZMX1:1	3ZMX1:1	1:11	1:11	1:11
3AZ211:1	5Q:Q1	Q1:11	31ZMXM:2	A/1:/	3Z5X1:1	3Z5X1:1	1:11	1:11	1:11
3AZ/11:1	5Q:Q1	Q1:11	31ZMXM:X	A/1:/	3ZQX1:1	3ZQX1:1	1:11	1:11	1:11
3AZX11:1	5Q:Q1	Q1:11	31ZMXM:5	A/1:/	AZ1X1:1	AZ1X1:1	1:11	1:11	1:11
3AZM11:1	5Q:Q1	Q1:11	31ZMX5:1	A/1:2	AZ3X1:1	AZ3X1:1	1:11	1:11	1:11
3AZ511:1	5Q:Q1	Q1:11	31ZMX5:3	A/1:2	AZAX1:1	AZAX1:1	1:11	1:11	1:11
3AZQ11:1	5Q:Q1	Q1:11	31ZMX5:0	A/1:2	AZ0X1:1	AZ0X1:1	1:11	1:11	1:11
30Z111:1	5Q:Q1	Q1:11	31ZMX5:/	A/1:2	AZ2X1:1	AZ2X1:1	1:11	1:11	1:11
30Z311:1	5Q:Q1	Q1:11	31ZMX5:M	A/1:2	AZ/X1:1	AZ/X1:1	1:11	1:11	1:11
30ZA11:1	5Q:Q1	Q1:11	31ZMX5:5	A/1:2	AZXX1:1	AZXX1:1	1:11	1:11	1:11
30Z011:1	5Q:Q1	Q1:11	31ZMXQ:1	A/1:2	AZMX1:1	AZMX1:1	1:11	1:11	1:11
30Z211:1	5Q:Q1	Q1:11	31ZMXQ:A	A/1:2	AZ5X1:1	AZ5X1:1	1:11	1:11	1:11
30Z/11:1	5Q:Q1	Q1:11	31ZMXQ:0	A/1:2	AZQX1:1	AZQX1:1	1:11	1:11	1:11
30ZX11:1	5Q:Q1	Q1:11	31ZMXQ:/	A/1:2	0Z1X1:1	0Z1X1:1	1:11	1:11	1:11
30ZM11:1	5Q:Q1	Q1:11	31ZMXQ:M	A/1:2	0Z3X1:1	0Z3X1:1	1:11	1:11	1:11
30Z511:1	5Q:Q1	Q1:11	31ZMXQ:Q	A/1:2	0ZAX1:1	0ZAX1:1	1:11	1:11	1:11
30Z5M2:X	5Q:Q1	Q1:11	31ZMM1:1	A/1:2	0Z002:X	0Z002:X	1:11	1:11	1:11
Base Middle Bakken Sand Target									
30ZQ11:1	5Q:Q1	Q1:11	31ZMM1:1	A/1:2	0Z0X1:1	0Z0X1:1	1:11	1:11	1:11
32Z111:1	5Q:Q1	Q1:11	31ZMM1:A	A/1:2	0Z2X1:1	0Z2X1:1	1:11	1:11	1:11
32Z311:1	5Q:Q1	Q1:11	31ZMM1:2	A/1:2	0Z/X1:1	0Z/X1:1	1:11	1:11	1:11
32ZA11:1	5Q:Q1	Q1:11	31ZMM1:X	A/1:2	0ZXX1:1	0ZXX1:1	1:11	1:11	1:11
32Z011:1	5Q:Q1	Q1:11	31ZMM1:M	A/1:2	0ZMX1:1	0ZMX1:1	1:11	1:11	1:11
32Z211:1	5Q:Q1	Q1:11	31ZMM1:Q	A/1:2	0Z5X1:1	0Z5X1:1	1:11	1:11	1:11
32Z/11:1	5Q:Q1	Q1:11	31ZMM3:3	A/1:0	0ZQX1:1	0ZQX1:1	1:11	1:11	1:11
32ZX11:1	5Q:Q1	Q1:11	31ZMM3:0	A/1:0	2Z1X1:1	2Z1X1:1	1:11	1:11	1:11
32ZM11:1	5Q:Q1	Q1:11	31ZMM3:2	A/1:0	2Z3X1:1	2Z3X1:1	1:11	1:11	1:11

Database:	789$/111:3$;"!#Ä&$<=&)$8>	**Local Co-ordinate Reference:**	+ &ÄÄ$,Ä"!&$-&.&)Ä$!$23435$316
Company:	E ="=$Ā&*)(Ä&BH	**TVD Reference:**	+7?? $@$A15A:1B=C*$DE)"#"!&$Ä$7Ä&FG
Project:	!!." !$J"ÄÄ=	**MD Reference:**	+7?? $@$A15A:1B=C*$DE)"#"!&$Ä$7Ä&FG
Site:	3/0L4311+43MN35	**North Reference:**	K)B&
Well:	,Ä"!&$-&.&) Ä$/011$23435$316	**Survey Calculation Method:**	9"!"HBH$OB)F *B)&
Wellbore:	,Ä"!&$-&.&) Ä$/011$23435$316		
Design:	8&="#!$P3		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
32Z511:1	5Q:Q1	Q1:11	31ZMM3:X	A/1:0	2ZAX1:1	2ZAX1:1	1:11	1:11	1:11
32ZQ11:1	5Q:Q1	Q1:11	31ZMM3:5	A/1:0	2Z0X1:1	2Z0X1:1	1:11	1:11	1:11
3/Z111:1	5Q:Q1	Q1:11	31ZMMA:1	A/1:0	2Z2X1:1	2Z2X1:1	1:11	1:11	1:11
3/Z311:1	5Q:Q1	Q1:11	31ZMMA:3	A/1:0	2Z/X1:1	2Z/X1:1	1:11	1:11	1:11
3/ZA11:1	5Q:Q1	Q1:11	31ZMMA:0	A/1:0	2ZXX1:1	2ZXX1:1	1:11	1:11	1:11
3/Z011:1	5Q:Q1	Q1:11	31ZMMA:/	A/1:0	2ZMX1:1	2ZMX1:1	1:11	1:11	1:11
3/Z211:1	5Q:Q1	Q1:11	31ZMMA:M	A/1:0	2Z5X1:1	2Z5X1:1	1:11	1:11	1:11
3/Z/11:1	5Q:Q1	Q1:11	31ZMMA:5	A/1:0	2ZQX1:1	2ZQX1:1	1:11	1:11	1:11
3/ZX11:1	5Q:Q1	Q1:11	31ZMM0:1	A/1:0	/Z1X1:1	/Z1X1:1	1:11	1:11	1:11
3/ZM11:1	5Q:Q1	Q1:11	31ZMM0:A	A/1:0	/Z3X1:1	/Z3X1:1	1:11	1:11	1:11
3/Z511:1	5Q:Q1	Q1:11	31ZMM0:2	A/1:0	/ZAX1:1	/ZAX1:1	1:11	1:11	1:11
3/ZQ11:1	5Q:Q1	Q1:11	31ZMM0:/	A/1:0	/Z0X1:1	/Z0X1:1	1:11	1:11	1:11
3XZ111:1	5Q:Q1	Q1:11	31ZMM0:M	A/1:0	/Z2X1:1	/Z2X1:1	1:11	1:11	1:11
3XZ311:1	5Q:Q1	Q1:11	31ZMM0:Q	A/1:0	/Z/X1:1	/Z/X1:1	1:11	1:11	1:11
3XZA11:1	5Q:Q1	Q1:11	31ZMM2:3	A/1:0	/ZXX1:1	/ZXX1:1	1:11	1:11	1:11
3XZ011:1	5Q:Q1	Q1:11	31ZMM2:A	A/1:A	/ZMX1:1	/ZMX1:1	1:11	1:11	1:11
3XZ211:1	5Q:Q1	Q1:11	31ZMM2:2	A/1:A	/Z5X1:1	/Z5X1:1	1:11	1:11	1:11
3XZ/11:1	5Q:Q1	Q1:11	31ZMM2:X	A/1:A	/ZQX1:1	/ZQX1:1	1:11	1:11	1:11
3XZX11:1	5Q:Q1	Q1:11	31ZMM2:M	A/1:A	XZ1X1:1	XZ1X1:1	1:11	1:11	1:11
3XZM11:1	5Q:Q1	Q1:11	31ZMM2:Q	A/1:A	XZ3X1:1	XZ3X1:1	1:11	1:11	1:11
3XZ511:1	5Q:Q1	Q1:11	31ZMM/:3	A/1:A	XZAX1:1	XZAX1:1	1:11	1:11	1:11
3XZQ11:1	5Q:Q1	Q1:11	31ZMM/:0	A/1:A	XZ0X1:1	XZ0X1:1	1:11	1:11	1:11
3MZ111:1	5Q:Q1	Q1:11	31ZMM/:2	A/1:A	XZ2X1:1	XZ2X1:1	1:11	1:11	1:11
3MZ311:1	5Q:Q1	Q1:11	31ZMM/:X	A/1:A	XZ/X1:1	XZ/X1:1	1:11	1:11	1:11
3MZA11:1	5Q:Q1	Q1:11	31ZMM/:5	A/1:A	XZXX1:1	XZXX1:1	1:11	1:11	1:11
3MZ011:1	5Q:Q1	Q1:11	31ZMMX:1	A/1:A	XZMX1:1	XZMX1:1	1:11	1:11	1:11
3MZ211:1	5Q:Q1	Q1:11	31ZMMX:3	A/1:A	XZ5X1:1	XZ5X1:1	1:11	1:11	1:11
3MZ/11:1	5Q:Q1	Q1:11	31ZMMX:0	A/1:A	XZQX1:1	XZQX1:1	1:11	1:11	1:11
3MZX11:1	5Q:Q1	Q1:11	31ZMMX:/	A/1:A	MZ1X1:1	MZ1X1:1	1:11	1:11	1:11
3MZM11:1	5Q:Q1	Q1:11	31ZMMX:M	A/1:A	MZ3X1:1	MZ3X1:1	1:11	1:11	1:11
3MZ511:1	5Q:Q1	Q1:11	31ZMMX:5	A/1:A	MZAX1:1	MZAX1:1	1:11	1:11	1:11
3MZQ11:1	5Q:Q1	Q1:11	31ZMMM:1	A/1:A	MZ0X1:1	MZ0X1:1	1:11	1:11	1:11
35Z111:1	5Q:Q1	Q1:11	31ZMMM:A	A/1:3	MZ2X1:1	MZ2X1:1	1:11	1:11	1:11
35Z311:1	5Q:Q1	Q1:11	31ZMMM:2	A/1:3	MZ/X1:1	MZ/X1:1	1:11	1:11	1:11
35ZA11:1	5Q:Q1	Q1:11	31ZMMM:/	A/1:3	MZXX1:1	MZXX1:1	1:11	1:11	1:11
35Z011:1	5Q:Q1	Q1:11	31ZMMM:M	A/1:3	MZMX1:1	MZMX1:1	1:11	1:11	1:11
35Z211:1	5Q:Q1	Q1:11	31ZMMM:Q	A/1:3	MZ5X1:1	MZ5X1:1	1:11	1:11	1:11
35Z/11:1	5Q:Q1	Q1:11	31ZMM5:3	A/1:3	MZQX1:1	MZQX1:1	1:11	1:11	1:11
35ZX11:1	5Q:Q1	Q1:11	31ZMM5:A	A/1:3	5Z1X1:1	5Z1X1:1	1:11	1:11	1:11
35ZM11:1	5Q:Q1	Q1:11	31ZMM5:2	A/1:3	5Z3X1:1	5Z3X1:1	1:11	1:11	1:11
35Z511:1	5Q:Q1	Q1:11	31ZMM5:X	A/1:3	5ZAX1:1	5ZAX1:1	1:11	1:11	1:11
35ZQ11:1	5Q:Q1	Q1:11	31ZMM5:5	A/1:3	5Z0X1:1	5Z0X1:1	1:11	1:11	1:11
3QZ111:1	5Q:Q1	Q1:11	31ZMM5:Q	A/1:3	5Z2X1:1	5Z2X1:1	1:11	1:11	1:11
3QZ311:1	5Q:Q1	Q1:11	31ZMMQ:3	A/1:3	5Z/X1:1	5Z/X1:1	1:11	1:11	1:11
3QZA11:1	5Q:Q1	Q1:11	31ZMMQ:0	A/1:3	5ZXX1:1	5ZXX1:1	1:11	1:11	1:11
3QZ011:1	5Q:Q1	Q1:11	31ZMMQ:/	A/1:3	5ZMX1:1	5ZMX1:1	1:11	1:11	1:11
3QZ211:1	5Q:Q1	Q1:11	31ZMMQ:X	A/1:3	5Z5X1:1	5Z5X1:1	1:11	1:11	1:11
3QZ/11:1	5Q:Q1	Q1:11	31ZMMQ:5	A/1:3	5ZQX1:1	5ZQX1:1	1:11	1:11	1:11
3QZX11:1	5Q:Q1	Q1:11	31ZM51:1	A/1:3	QZ1X1:1	QZ1X1:1	1:11	1:11	1:11
3QZM11:1	5Q:Q1	Q1:11	31ZM51:3	A/1:3	QZ3X1:1	QZ3X1:1	1:11	1:11	1:11
3QZ511:1	5Q:Q1	Q1:11	31ZM51:0	A/1:1	QZAX1:1	QZAX1:1	1:11	1:11	1:11
3QZQ11:1	5Q:Q1	Q1:11	31ZM51:/	A/1:1	QZ0X1:1	QZ0X1:1	1:11	1:11	1:11
A1Z111:1	5Q:Q1	Q1:11	31ZM51:M	A/1:1	QZ2X1:1	QZ2X1:1	1:11	1:11	1:11
A1Z311:1	5Q:Q1	Q1:11	31ZM51:5	A/1:1	QZ/X1:1	QZ/X1:1	1:11	1:11	1:11

Database:	789$/111:3$;"!#Ä&$<=&)$8>	**Local Co-ordinate Reference:**	+ &ÄÄ$,Ä"!&$-&.&)Ä$/011$23435$316
Company:	E ="=$Ā&*)(Ä&BH	**TVD Reference:**	+7?? $@$A15A:1B=C*$DE)"#"!&$Ä$7Ä&FG
Project:	!!." !$J"ÄÄ=	**MD Reference:**	+7?? $@$A15A:1B=C*$DE)"#"!&$Ä$7Ä&FG
Site:	3/0L4311+43MN35	**North Reference:**	K)B&
Well:	,Ä"!&$-&.&) Ä$/011$23435$316	**Survey Calculation Method:**	9"!"HBH$OB)F *B)&
Wellbore:	,Ä"!&$-&.&) Ä$/011$23435$316		
Design:	8&="#!$P3		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
A1ZA11:1	5Q:Q1	Q1:11	31ZM53:1	A/1:1	QZXX1:1	QZXX1:1	1:11	1:11	1:11
A1Z011:1	5Q:Q1	Q1:11	31ZM53:A	A/1:1	QZMX1:1	QZMX1:1	1:11	1:11	1:11
A1Z211:1	5Q:Q1	Q1:11	31ZM53:2	A/1:1	QZ5X1:1	QZ5X1:1	1:11	1:11	1:11
A1Z/11:1	5Q:Q1	Q1:11	31ZM53:/	A/1:1	QZQX1:1	QZQX1:1	1:11	1:11	1:11
A1Z/Q1:1	5Q:Q1	Q1:11	31ZM53:M	A/1:1	31Z1/1:1	31Z1/1:1	1:11	1:11	1:11
5300 41-18 10B PBHL									

Design Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
/011$23435$316$Ā6J? 4$Ä !$R"*=$*#&*$T&!*&) 4$Ā("!*	1:11	1:11	31ZM53:M	A/1:1	31Z1/1:1	21/Z12M:AQ	3ZAA1Z1AA:M5	25W$2[$31:X23$L	310W$00[$20:QXM$+

Casing Points

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
33Z10M:1	31ZMX/:1	MY	M	5012

Database:	789$/111:3$;"!#Ä&$<=&)$8>	**Local Co-ordinate Reference:**	+ &ÄÄ$,Ä"!&$-&.&)Ā$1$23435$316
Company:	E ="=$Ā&*)(Ä&BH	**TVD Reference:**	+7?? $@$A15A:1B=C*$DE)"#"!&$ĀA7Ä&FG
Project:	!!." !$J"ÄÄ=	**MD Reference:**	+7?? $@$A15A:1B=C*$DE)"#"!&$ĀA7Ä&FG
Site:	3/0L4311+43MN35	**North Reference:**	K)B&
Well:	,Ä"!&$-&.&) Ā$/011$23435$316	**Survey Calculation Method:**	9"!"HBH$OB)F *B)&
Wellbore:	,Ä"!&$-&.&) Ā$/011$23435$316		
Design:	8&="#!$P3		

Formations

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
3ZQMA:1	3ZQMA:1	Ā"&))&			
2ZX2X:3	2ZX2X:1	\)&&!R()!			
/Z1/M:3	/Z1/M:1	9(^)_			
/Z2M3:3	/Z2M3:1	8 U(*			
XZ25X:A	XZ25X:1	%"&).(!			
XZ532:A	XZ532:1	8B!R H$; Ä*			
XZQAQ:A	XZQAQ:1	8B!R H$; Ä*$6 =&			
MZ1A2:A	MZ1A2:1	;'&)C"=R			
MZA50:A	MZA50:1	Ā"!&$; Ä*			
MZ035:A	MZ035:1	Ā"!&$; Ä*$6 =&			
MZ0M2:A	MZ0M2:1	E'&TR&$; Ä*			
MZ210:A	MZ210:1	E'&TR&$; Ä*$6 =&			
MZX1/:A	MZX1/:1	6)((H$O)&&U$D(H$(C$9"!!&ÄB= $\':G			
MZX52:A	MZX52:1	SH=.&!			
MZ5/0:A	MZ5/0:1	K_Ä&)			
5Z12M:A	5Z12M:1	E**&)$D6 =&$(C$9"!!&ÄB= $\':G			
5Z0Q1:A	5Z0Q1:1	,">>&_$?"H&			
5Z/2A:A	5Z/2A:1	OR)Ä&=$; Ä*			
QZ3/Q:A	QZ3/Q:1	<6			
QZA05:A	QZA05:1	6 =&$? =*$; Ä*			
QZ013:A	QZ013:1	% *TÄ[illegible]&			
QZ2/2:A	QZ2/2:1	9"=="(!$O !_(!			
31Z1AA:A	31Z1AA:1	?(.#&'(Ä&			
31ZA1Q:A	31ZA1Q:1	?(.#&'(Ä&$-) T*B)&$V(!&			
31Z520:2	31ZMAX:1	- Ä=&$6 UU&!			
31Z5XM:/	31ZM0/:1	<"&)$6 UU&!			
31ZQA3:M	31ZM/3:1	9"..Ä&$6 UU&!			
31ZQX5:0	31ZMX1:1	9"..Ä&$6 UU&!$; !.$ K)#&*			
30Z5M2:X	31ZMM1:1	6 =&$9"..Ä&$6 UU&!$; !.$ K)#&*			

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	Local Coordinates +E/-W (usft)	Comment
31ZA5M:5	31ZA5M:X	30:X	25:3	,EĀ $6B"Ä.$3AWN311[
33Z10M:1	31ZMX/:1	320:1	/1X:Q	7EO

SECTION BREAKDOWN

OASIS PETROLEUM NORTH AMERICA, LLC
1001 FANNIN, SUITE 1500, HOUSTON, TX 77002
"KLINE FEDERAL 5300 41-18 10B"
500 FEET FROM SOUTH LINE AND 237 FEET FROM WEST LINE
SECTIONS 17 & 18, T153N, R100W, 5th P.M., MCKENZIE COUNTY, NORTH DAKOTA

- MONUMENT – RECOVERED
- MONUMENT – NOT RECOVERED

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ALL AZIMUTHS ARE BASED ON G.P.S. OBSERVATIONS. THE ORIGINAL SURVEY OF THIS AREA FOR THE GENERAL LAND OFFICE (G.L.O.) WAS 1891. THE CORNERS FOUND ARE AS INDICATED AND ALL OTHERS ARE COMPUTED FROM THOSE CORNERS FOUND AND BASED ON G.L.O. DATA. THE MAPPING ANGLE FOR THIS AREA IS APPROXIMATELY 0°03'.

VICINITY MAP

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Revision No.	Date	By	Description

OASIS PETROLEUM NORTH AMERICA, LLC
SECTION BREAKDOWN
SECTIONS 17 & 18, T153N, R100W
MKENZIE COUNTY, NORTH DAKOTA

Drawn By: B.H.H. Project No.: S14-08-081.04
Checked By: R.L.P. Date: APRIL 2014

Interstate Engineering, Inc.
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Sidney, Montana 59270
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Fax (406) 433-5618
www.interstateeng.com
Other offices in Minnesota, North Dakota and South Dakota

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WELL LOCATION PLAT

OASIS PETROLEUM NORTH AMERICA, LLC
1001 FANNIN, SUITE 1500, HOUSTON, TX 77002
"KLINE FEDERAL 5300 41-18 10B"
500 FEET FROM SOUTH LINE AND 237 FEET FROM WEST LINE
SECTION 18, T153N, R100W, 5th P.M., MCKENZIE COUNTY, NORTH DAKOTA

VICINITY MAP

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0 1000
1" = 1000'

✚ - MONUMENT - RECOVERED
✚ - MONUMENT - NOT RECOVERED

STAKED ON 4/15/14
VERTICAL CONTROL DATUM WAS BASED UPON CONTROL POINT 4 WITH AN ELEVATION OF 2090.8'

THIS SURVEY AND PLAT IS BEING PROVIDED AT THE REQUEST OF ERIC BAYES OF OASIS PETROLEUM. I CERTIFY THAT THIS PLAT CORRECTLY REPRESENTS WORK PERFORMED BY ME OR UNDER MY SUPERVISION AND IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF.

ROBERT L. PROCIVE 2884LS

REGISTERED LAND SURVEYOR
ROBERT L. PROCIVE
LS-2884
DATE: 4/15/14
NORTH DAKOTA

Revision No.	Date	By	Description

OASIS PETROLEUM NORTH AMERICA, LLC
WELL LOCATION PLAT
SECTION 18, T153N, R100W
MCKENZIE COUNTY, NORTH DAKOTA

Drawn By: B.H.H. | Project No.: S14-09-081.04
Checked By: B.L.P. | Date: APRIL 2014

Interstate Engineering, Inc.
P.O. Box 648
425 East Main Street
Sidney, Montana 59270
Ph: (406) 433-5617
Fax: (406) 433-5618
www.interstateeng.com
Other offices in Minnesota, North Dakota and South Dakota

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PAD LAYOUT

OASIS PETROLEUM NORTH AMERICA, LLC
1001 FANNIN, SUITE 1500, HOUSTON, TX 77002
"KLINE FEDERAL 5300 41-18 9T"
533 FEET FROM SOUTH LINE AND 237 FEET FROM WEST LINE
SECTION 18, T153N, R100W, 5th P.M., MCKENZIE COUNTY, NORTH DAKOTA

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NOTE: Pad dimensions shown are to usable area, the v-ditch and berm areas shall be built to the outside of the pad dimensions.

REGISTERED LAND SURVEYOR
ROBERT L. PROCIVE
LS-2884
DATE: 4/15/14
NORTH DAKOTA

V-DITCH DETAIL

Proposed Contours
Original Contours
BERM
DITCH

NOTE: All utilities shown are preliminary only, a complete utilities location is recommended before construction.

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0 80
1" = 80'

3/8
SHEET NO.

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OASIS PETROLEUM NORTH AMERICA, LLC
PAD LAYOUT
SECTION 18, T153N, R100W
MCKENZIE COUNTY, NORTH DAKOTA

Drawn By: B.H.H. | Project No.: S14-09-081.05
Checked By: D.D.K. | Date: APRIL 2014

Revision No.	Date	By	Description

Q:\2014\S14-09-\081.05 Oasis Petroleum - Kline Federal 5300 41-18 9T Location\CAD\Kline Federal 5300 41-18 9T.dwg - 4/15/2014 3:59 PM josh schmierer

CROSS SECTIONS

OASIS PETROLEUM NORTH AMERICA, LLC
1001 FANNIN, SUITE 1500, HOUSTON, TX 77002
"KLINE FEDERAL 5300 41-18 10B"
500 FEET FROM SOUTH LINE AND 237 FEET FROM WEST LINE
SECTION 18, T153N, R100W, 5th P.M., MCKENZIE COUNTY, NORTH DAKOTA

REGISTERED LAND SURVEYOR
ROBERT L. PROCIVE
2884
DATE: 4/15/14
NORTH DAKOTA

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SCALE
HORIZ 1"=140'
VERT 1"=35'

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7/8
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CROSS SECTIONS
SECTION 18, T153N, R100W
MCKENZIE COUNTY, NORTH DAKOTA

Drawn By: B.H.H. | Project No.: S14-09-081.04
Checked By: R.L.P. | Date: APRIL 2014

Revision No.	Date	By	Description

ACCESS APPROACH

OASIS PETROLEUM NORTH AMERICA, LLC
1001 FANNIN, SUITE 1500, HOUSTON, TX 77002
"KLINE FEDERAL 5300 41-18 10B"
500 FEET FROM SOUTH LINE AND 237 FEET FROM WEST LINE
SECTION 18, T153N, R100W, 5th P.M., MCKENZIE COUNTY, NORTH DAKOTA

THIS DOCUMENT WAS ORIGINALLY ISSUED AND SEALED BY ROBERT L. PROCIVE, PLS, REGISTRATION NUMBER 2884 ON 4/15/14 AND THE ORIGINAL DOCUMENTS ARE STORED AT THE OFFICES OF INTERSTATE ENGINEERING, INC.

REGISTERED LAND SURVEYOR
ROBERT L. PROCIVE
LS-2884
DATE: 4/15/14
NORTH DAKOTA

0 500
1" = 500'

NOTE: All utilities shown are preliminary only, a complete utilities location is recommended before construction.

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Interstate Engineering, Inc.
P.O. Box 648
425 East Main Street
Sidney, Montana 59270
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Other offices in Minnesota, North Dakota and South Dakota

OASIS PETROLEUM NORTH AMERICA, LLC
ACCESS APPROACH
SECTION 18, T153N, R100W

MCKENZIE COUNTY, NORTH DAKOTA

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OASIS PETROLEUM NORTH AMERICA, LLC
QUAD LOCATION MAP
SECTION 18, T153N, R100W
MCKENZIE COUNTY, NORTH DAKOTA

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COUNTY ROAD MAP

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SCALE: 1" = 2 MILE

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OASIS PETROLEUM NORTH AMERICA, LLC
COUNTY ROAD MAP
SECTION 18, T153N, R100W
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WELL LOCATION SITE QUANTITIES

OASIS PETROLEUM NORTH AMERICA, LLC
1001 FANNIN, SUITE 1500, HOUSTON, TX 77002
"KLINE FEDERAL 5300 41-18 10B"
500 FEET FROM SOUTH LINE AND 237 FEET FROM WEST LINE
SECTION 18, T153N, R100W, 5th P.M., MCKENZIE COUNTY, NORTH DAKOTA

WELL SITE ELEVATION	2055.7
WELL PAD ELEVATION	2057.0

EXCAVATION	20,682
PLUS PIT	18,900
	39,582
EMBANKMENT	11,538
PLUS SHRINKAGE (30%)	3,461
	14,999
STOCKPILE PIT	18,900
STOCKPILE TOP SOIL (6")	5,261
BERMS	1,889 LF = 612 CY
DITCHES	1,649 LF = 252 CY
DETENTION AREA	2,341 CY
STOCKPILE MATERIAL	2,403
DISTURBED AREA FROM PAD	6.52 ACRES

NOTE: ALL QUANTITIES ARE IN CUBIC YARDS (UNLESS NOTED)
CUT END SLOPES AT 1:1
FILL END SLOPES AT 1.5:1

WELL SITE LOCATION
500' FSL
237' FWL

BERM DETAIL

DITCH DETAIL

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QUANTITIES
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OASIS PETROLEUM

5/29/2014

Mineral Resources Permit Manager
North Dakota Industrial Commission
600 East Boulevard Avenue Dept. 405
Bismarck, ND 58505-0840

RE: **Kline Federal 5300 41-18 9T**
Kline Federal 5300 41-18 10B
Kline Federal 5300 41-18 11T2
Kline Federal 5300 41-18 12TX
Kline Federal 5300 41-18 13T2X
Kline Federal 5300 41-18 14BX
Request for a legal street address

Dear NDIC:

Oasis Petroleum has requested a physical street address for the Kline Federal 5300 41-18 9T, Kline Federal 5300 41-18 10B, Kline Federal 5300 41-18 11T2, Kline Federal 5300 41-18 12TX, Kline Federal 5300 41-18 13T2X, and Kline Federal 5300 41-18 14BX. The request was made to Aaron Chisolm, in McKenzie County. Upon receiving a legal street address, Oasis will submit the address to the NDIC on a Sundry Notice (form 4) pursuant to 43-02-03-28.

Thank you for your consideration.

Respectfully,

Heather McCowan

Heather McCowan
Regulatory Assistant
Oasis Petroleum North America, LLC

Surface Damage Affidavit

STATE OF NORTH DAKOTA)
) ss.
COUNTY OF WILLIAMS)

James DeMorrett, being duly sworn, states as follows:

The below described lands are not located in a wellhead protection/source water protection area per the website provided by the NDIC

and the adjacent landowner is fully aware that Oasis Petroleum will be drilling and operating multiple wells on spacing unit from a surface location in Section 18: Lot 4 a/k/a SW¼SW¼, Township153 North, Range 100 West, 5th P.M., McKenzie County, North Dakota. (totaling 6.52 acres). The adjacent surface landowner is fully aware that the above referenced location will consist of the well bores and pumping units only and will not have cuttings pits, storage tanks or flare pits.

Dated this 16th day of June, 2014

James DeMorrett

STATE OF NORTH DAKOTA }
} SS.
COUNTY OF WILLIAMS }

BE IT REMEMBERED, That on this 16 day of June, 2014 before me, a Notary Public, in and for said County and State, personally appeared James DeMorrett, to me known to be the identical persons described in and who executed the within and foregoing instrument and acknowledged to me that he executed the same as his free and voluntary act and deed for the uses and purposes therein set forth.

IN WITNESS WHEREOF, I have hereunto set my official signature and affixed my notarial seal, the day and year first above written.

My commission expires: Nov 18, 2017

Notary Public

NOTARY STAMP

DAMON JORGENSEN
Notary Public
State of North Dakota
My Commission Expires Nov. 18, 2017