NORTH DAKOTA
OIL AND GAS DIVISION

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/

October 3, 2019

Mr. Jonathon Travis
Ryan, LLC
2800 Post Oak Boulevard, Suite 4200
Houston, TX 77056

RE: Kline Federal #5300 31-18 7T
Lot 3 Sec. 18, T.153N., R.100W.
McKenzie County, North Dakota
Baker Field
Well File No. 28755
STRIPPER WELL DETERMINATION

Dear Mr. Travis:

Oasis Petroleum North America LLC (Oasis) filed with the North Dakota Industrial Commission – Oil and Gas Division (Commission) on September 4, 2019 an application for a Stripper Well Determination for the above captioned well.

Information contained in the application indicates that the above mentioned well is a stripper well pursuant to statute and rule, and Oasis has elected to designate said well as a stripper well. The well produced from a well depth greater than 10000 feet and was completed after June 30, 2013. During the qualifying period, August 1, 2017 through July 31, 2018, the well produced at a maximum efficient rate or was not capable of exceeding the production threshold. The average daily production from the well was 34.1 barrels of oil per day during this period.

It is therefore determined that the above captioned well qualifies as a "Stripper Well" pursuant to Section 57-51.1-01 of the North Dakota Century Code. This determination is applicable only to the Bakken Pool in and under said well.

The Commission shall have continuing jurisdiction, and shall have the authority to review the matter, and to amend or rescind the determination if such action is supported by additional or newly discovered information. If you have any questions, do not hesitate to contact me.

Sincerely,

David J. McCusker
Petroleum Engineer

Cc: ND Tax Department

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
MAR 3 2016
ND Oil & Gas Division

Well File No. **28755**

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: **December 16, 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
- [ ] Redrilling or Repair
- [ ] Casing or Liner
- [ ] Plug Well
- [ ] Supplemental History
- [ ] Temporarily Abandon
- [ ] Other **Well is now on pump**
- [ ] Spill Report
- [ ] Shooting
- [ ] Acidizing
- [ ] Fracture Treatment
- [x] Change Production Method
- [ ] Reclamation

Well Name and Number					
Kline Federal 5300 31-18 7T					
Footages	Qtr-Qtr	Section	Township	Range	
2490 F S L 238 F W L	**LOT3**	**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 12/16/2015 the above referenced well is on pump.

End of Tubing: 2-7/8" L-80 tubing @ 10149'

Pump: ESP @ 9691.38'

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	**March 2, 2016**	
Email Address		
jswenson@oasispetroleum.com		

FOR STATE USE ONLY

[x] Received	[ ] Approved
Date 3-21-2016	
By Taylor Roth	
Title TAYLOR ROTH Engineering Technician	

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)

Well File No.
28755
NDIC CTB No.
0

228651

mckenzie

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 31-18 7T	LOT3	18	153	100	~~Williams~~

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 17, 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 17, 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 17, 2015
Other Transporters Transporting From This Lease	**% Transported**	**Date Effective**
		September 17, 2015

Comments

I hereby swear or affirm that the information provided is true, complete and correct as determined from all available records.		Date
		October 22, 2015
Signature	Printed Name	Title
	Brianna Salinas	Marketing Assistant

Above Signature Witnessed By:

Signature	Printed Name	Title
Laura Whitten	Laura Whitten	Marketing Analyst II

OCT 2015
RECEIVED
ND OIL & GAS
DIVISION

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Date Approved	OCT 27 2015
By	Evie Roberson
Title	Oil & Gas Production Analyst

TH

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)

RECEIVED OCT 2015 ND OIL & GAS DIVISION

Well File No. **28755**

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 31-18 7T**			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
2490 F S L **238** F WL	**LOT3**	**18**	**153 N**	**100 W**	**McKenzie**

Spud Date	Date TD Reached	Drilling Contractor and Rig Number	KB Elevation (Ft)	Graded Elevation (Ft)
February 21, 2015	**April 23, 2015**	**Nabors B22**	**2033**	**2008**

Type of Electric and Other Logs Run (See Instructions)
MWD/GR from KOP to TD

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	2116	17 1/2	54.5			1204	0
Vertical Hole	Intermediate	7	0	11068	8 3/4	32			834	2465
Lateral1	Liner	4 1/2	10199	20551	6	13.5			511	10199

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	20561	Perforations	11068	20551	10250		07/12/2015			

PRODUCTION

Current Producing Open Hole or Perforated Interval(s), This Completion, Top and Bottom, (MD Ft): **Lateral 1- 11068' to 20551'**

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)
September 17, 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
09/17/2015	**24**	**32 /64**		**1774**	**1150**	**5837**	**42.0 °**	**Sold**

Flowing Tubing Pressure (PSI)	Flowing Casing Pressure (PSI)	Calculated 24-Hour Rate	Oil (Bbls)	Gas (MCF)	Water (Bbls)	Gas-Oil Ratio
	1750		**1774**	**1150**	**5837**	**648**

GEOLOGICAL MARKERS

Formation	MD (Ft)	TVD (Ft)
Dakota	5440	5440
Kibbey Lime	8326	8325
First Charles Salt	8471	8470
UB	9087	9086
Base Last Salt	9154	9153
Ratcliffe	9184	9183
Mission Canyon	9393	9392
Lodgepole	9939	9938
False Bakken	10712	10664
Scallion	10716	10666
Upper Bakken	10727	10673
Middle Bakken	10756	10689
Lower Bakken	10836	10733
Pronghorn	10865	10746
Three Forks	10903	10760

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
07/12/2015	Three Forks	19681	20551	3	10330	Barrels

Type Treatment	Acid %	Lbs Proppant	Maximum Treatment Pressure (PSI)	Maximum Treatment Rate (BBLS/Min)
Sand Frac		295940	8729	35.9

Details
100 Mesh White: 21060
40/70 White: 107840
30/50 White; 167040

Date Stimulated	Stimulated Formation	Top (Ft)	Bottom (Ft)	Stimulation Stages	Volume	Volume Units
07/30/2015	Three Forks	11068	19681	33	200534	Barrels

Type Treatment	Acid %	Lbs Proppant	Maximum Treatment Pressure (PSI)	Maximum Treatment Rate (BBLS/Min)
Sand Frac		3873780	9488	71.0

Details
100 Mesh White: 282880
40/70 White: 1436860
30/50 Ceramic: 2154040

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	10/20/2015
Signature	Printed Name	Title
	Jennifer Swenson	Regulatory Specialist

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)

Well File No. **28755**

SEP 2015 RECEIVED ND OIL & GAS DIVISION

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 31-18 7T**	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
2490 F **S** L **238** F **W** L	**LOT3**	**18**	**153 N**	**100 W**	**McKenzie**

Spud Date	Date TD Reached	Drilling Contractor and Rig Number	KB Elevation (Ft)	Graded Elevation (Ft)
February 21, 2015	**April 23, 2015**	**Nabors B22**	**2033**	**2008**

Type of Electric and Other Logs Run (See Instructions)
MWD/GR from KOP to TD

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**	**2116**	**17 1/2**	**54.5**			**1204**	**0**
Vertical Hole	**Intermediate**	**7**	**0**	**11068**	**8 3/4**	**32**			**834**	
Lateral1	**Liner**	**4 1/2**	**10199**	**20551**	**6**	**13.5**			**511**	**10199**

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	**20561**	**Perforations**			**10250**					

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	Production for Test	Oil (Bbls)	Gas (MCF)	Water (Bbls)	Oil Gravity-API (Corr.)	Disposition of Gas
		/64					°	

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	5440	5440
Kibbey Lime	8326	8325
First Charles Salt	8471	8470
UB	9087	9086
Base Last Salt	9154	9153
Ratcliffe	9184	9183
Mission Canyon	9393	9392
Lodgepole	9939	9938
False Bakken	10712	10664
Scallion	10716	10666
Upper Bakken	10727	10673
Middle Bakken	10756	10689
Lower Bakken	10836	10733
Pronghorn	10865	10746
Three Forks	10903	10760

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 **08/31/2015**
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)

JUL 2015 RECEIVED ND OIL & GAS DIVISION

Well File No. **28755**

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

☑ Notice of Intent	Approximate Start Date **July 14, 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 **Waiver from tubing/packer requirement**	

Well Name and Number					
Kline Federal 5300 31-18 7T					
Footages	Qtr-Qtr	Section	Township	Range	
2490 F S L 238 F W L	**LOT3**	**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 **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 **July 14, 2015**	
Email Address **jswenson@oasispetroleum.com**		

FOR STATE USE ONLY

☐ Received	☒ Approved
Date July 31, 2015	
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)

RECEIVED AUG 12 2015 ND OIL & GAS DIVISION

Well File No. 28755

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

☑ Notice of Intent	Approximate Start Date: August 12, 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 31-18 7T					
Footages	Qtr-Qtr	Section	Township	Range	
2490 F S L 238 F W L	LOT3	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 immediately, we request CONFIDENTIAL STATUS for the above referenced well.

This well has not been completed.

OFF CONFIDENTIAL 2/12/16.

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: August 12, 2015	
Email Address: jswenson@oasispetroleum.com		

FOR STATE USE ONLY

☐ Received	☒ Approved
Date: 8/13/15.	
By: Alice D. Webber	
Title: Engineering Technician	

Oasis Petroleum North America, LLC

Kline Federal 5300 31-18 7T

2,490' FSL & 238' FWL
Lot 3 Section 18, T153N, R100W
Baker Field / First Bench Three Forks
McKenzie County, North Dakota

BOTTOM HOLE LOCATION:
540.92' South & 9,896.97' East of surface location or approx.
1,949.08' FSL & 354.19' FEL, NE SE Sec. 17, T153N, R100W

Prepared for:
Brendan Hargrove
Oasis Petroleum North America, LLC
1001 Fannin Suite 1500
Houston, TX 77002

Prepared by:
Michelle R. Baker, Zachary Moses
PO Box 80507; Billings, MT 59108
(406) 259-4124
geology@sunburstconsulting.com
www.sunburstconsulting.com

WELL EVALUATION

Figure 1. Nabors Drilling rig B22 at the Oasis Petroleum Kline Federal 5300 31-18 7T; April, 2015 McKenzie County, North Dakota.

INTRODUCTION

The ***Oasis Petroleum North America, LLC Kline Federal 5300 31-18 7T*** [Lot 3 Section 18, T153N, R100W] is located in Baker Field of the Williston Basin in western North Dakota. This section lies approximately 7 miles south of the town of Williston and adjacent to Lake Sakakawea in McKenzie County. The Kline Federal 5300 31-18 7T is a horizontal First Bench Three Forks well, in a double-section, laydown spacing unit permitted to drill to the east from the surface location within Section 18, continuing through Section 17 to the proposed bottom-hole location (PBHL) in that section. There are 500' setbacks along the north and south borders and 200' setbacks from the east and west borders within the 1,280 acre spacing unit. The well consists of one Three Forks lateral. The vertical hole was planned to be drilled to approximately 10,293'. The curve would be built at 12 degrees per 100' to land within the First Bench Three Forks. Directional drilling technologies and geosteering techniques were used to land in the Three Forks reservoir and maintain exposure to the ideal target rock. Oasis Petroleum is targeting a dolomite and shale facies of the upper Three Forks Formation with intent to intersect porosity and fracture trends enhancing reservoir quality.

OFFSET WELLS

Offset well data used for depth correlation during curve operations are found in the 'Control Data' section appended to this report. Offset well control was essential in providing control data, making it possible to develop a prognosis of formation tops and landing target depth. By

referencing the gamma signature of these offsets, a model was formed for the target interval pinpointing a strategic landing. Formation thicknesses expressed by gamma ray signatures in these wells were compared to gamma data collected during drilling operations in order to successfully land the curve. The target landing true vertical depth (TVD) was periodically updated during drilling to ensure accurate landing of the curve.

GEOLOGY

The Mission Canyon Formation [Mississippian Madison Group] was logged 9,393' MD 9,392' TVD (-7,359' SS). The Mission Canyon Formation consisted of a lime mudstone that was described as light gray, light brown to brown, gray brown, trace dark gray in color. The lime mudstone was predominately friable to firm, with an earthy to rare crystalline texture. Some intervals contained a trace of black-brown algal material, traces of fossil fragments, and traces of disseminated pyrite. Also present was an argillaceous lime mudstone that was described as light gray, occasional medium gray, rare gray tan, rare off white, trace dark gray in color. The argillaceous lime mudstone was predominately firm to friable, crystalline to chalky texture. Some intervals contained a trace of disseminated pyrite. The highest gas shows were 71 to 115 units and 79 units of connection gas in the Mission Canyon. Rare intercrystalline porosity was noted as well as trace *spotty light brown oil stain* while logging the Mission Canyon Formation.

The Upper Bakken Shale [Mississippian-Bakken Formation] was drilled at 10,727' MD 10,673' TVD (-8,640' SS). Entry into this member was characterized by high gamma, elevated background gas and increased rates of penetration. The black to black gray carbonaceous and *petroliferous* shale was hard with a sub blocky to sub platy texture. Fracture porosity was noted, and trace minerals were observed including disseminated pyrite and calcite fracture fill. Hydrocarbons evaluated in this interval reached a maximum of 2,881 units of drilling gas.

The Middle Bakken [Mississippian-Devonian Bakken Formation] was drilled at 10,756' MD 10,689' TVD (-8,656' SS) which was -2' low to the Oasis Petroleum NA LLC Kline Federal 5300 31-18 15T. Samples in the Middle Bakken Member were predominantly silty sandstone which was described as light gray brown, light brown, trace light gray in color. It was very fine grained, friable, subrounded, smooth, moderately sorted, with calcite cement, moderately cemented. A trace of disseminated and nodular pyrite was noted as was fair intergranular porosity. Also noted was *common light to medium brown spotty to even oil stain*. Hydrocarbons evaluated in this interval reached a maximum of 1,225 units of drilling gas.

The Lower Bakken Shale [Devonian-Bakken Formation] was drilled at 10,836' MD 10,733' TVD (-8,700' SS). Entry into this interval was characterized by high gamma, elevated background gas and increased rates of penetration. The carbonaceous black, black gray shale is *petroliferous*, hard, splintery, smooth and exhibits possible fracture porosity. Trace minerals included disseminated pyrite. Drilling gas in this interval reached a maximum of 1,160.

The Pronghorn Member [Devonian-Bakken Formation] was reached at 10,865' MD 10,746' TVD (-8,713' SS). Entry into this interval was characterized by lower gamma, and slightly slower penetration rates. Samples from the Pronghorn were described as siltstone which was dark gray trace gray black, friable to firm, subblocky to subplaty. This siltstone was moderately dolomite

cemented and included disseminated and nodular pyrite. Also noted was a trace of *spotty light brown oil stain*. Drilling gas in this interval reached a maximum of 939 units.

The Three Forks [Devonian] was reached at 10,903' MD 10,760' TVD (-8,727' SS) which was -6' low to the Oasis Petroleum NA LLC Kline Federal 5300 31-18 15T. The target zone of the Three Forks was to be drilled in a predominately 14 foot zone beginning 12 feet into the Three Forks.

Samples in the Three Forks were predominantly dolomite which was described as light brown-light brown gray, tan-cream, trace pink in color. It was firm, laminated, with a microsucrosic texture. Rare disseminated pyrite was noted as was occasional intercrystalline porosity. Also noted was *common spotty to rare even light brown oil stain*. Also observed was light green-light gray green, mint green shale that was firm, subblocky, with an earthy texture. Occasional disseminated pyrite was noted as was tight intergranular porosity.

Figure 2 & 3. Three Forks interbedded dolomite and shale in dry (left) and wet (right) samples from the target zone.

Hydrocarbon Shows

Gas monitoring and fluid gains provided evidence of a hydrocarbon saturated reservoir during the drilling of the Kline Federal 5300 31-18 7T. Oil and gas shows at the shakers and in samples were continuously monitored. In the closed mud system, hydrostatic conditions were maintained near balance, this allowed for gas and fluid gains from the well to be evaluated. Gas varied according to stratigraphic position and penetration rates which may have reflected increased porosity. During the vertical, gas peaks of 41 to 135 units were noted, against a 9.4-10.5 lb/gal diesel-invert mud weight. Background concentrations in the lateral ranged from 170to 5,036 units, against a 9.6-9.7 lb/gal saltwater gel drilling fluid. Chromatography of gas revealed typical concentrations of methane, characteristic of First Bench Three Forks gas.

Figure 4. Chromatography of a gas sample on the Kline Federal 5300 31-18 7T.

Figure 5. Profile displaying total gas, gamma ray and rate of penetration.

Geosteering

Ryan Energy Technologies provided personnel and equipment for measurement-while-drilling (MWD) services. The RPM directional drillers, MWD, and Sunburst Consulting personnel worked closely together throughout the project to evaluate data and make steering decisions to maximize the amount of borehole in the targeted zones and increase rate of penetration (ROP) of the formation.

The 870' curve was drilled in 27 hours, circulating time. Two curve assemblies were used to complete the curve. The first was a bottom hole assembly (BHA) consisting of bit #4; a Security MMD55M PDC bit, attached to a 2.38 degree fixed NOV stage 7/8 5.0 motor and MWD tools. Due to insufficient builds, the decision was made to pull the assembly at 10,654' and continue the curve with a more severely bent motor and new bit. A new BHA was tripped in consisting of bit #5; a Security MMD55M PDC bit, attached to a 2.6 degree fixed NOV stage 7/8 5.0 motor and MWD tools The curve was successfully landed at 11,090' MD and 10,780' TVD, approximately 20' into the Three Forks. Seven inch diameter 32# HCP-110 intermediate casing was set to 11,063' MD.

Geologic structure maps of the Kline Federal 5300 31-18 7T and surrounding control wells had estimated gross formation dip to be down at approximately -0.2º to the TD of the lateral. The preferred drilling interval consisted of an 11' zone of dolomite and shale and a 3' zone of claystone located approximately 11' into the Three Forks. Penetration rates, gas shows, gamma ray data, and sample observations were utilized to keep the wellbore in the preferred stratigraphic position in the target zone. Using offset well data provided by Oasis representatives, projected porosity zones were identified in the preferred drilling areas.

Figure 6. Offset well target definition, Indian Hills Prospect (Oasis).

Steering decisions were made by using the low gamma in the lower portion of the target zone to establish the well-bore's position in the target zone. If the well-bore moved lower, the higher gamma of the underlying claystone (G) was observed, as was the presence of claystone in collected samples. Slides were then utilized to move the well-bore back up into the target zone. As the well-bore moved higher, approaching the top of the target zone the high to medium fluctuating gamma (D) was noted. Samples in the lower gamma portion of the target zone contained noticeably greater concentrations of the light brown-light brown gray, tan-cream, trace pink dolomite; as the well-bore moved higher in zone the samples tended to have more of the light gray, off white, gray brown dolomite. This lateral was drilled in less than 4 days from casing exit to TD, with one lateral assembly. The TD of 20,561' MD was achieved at 14:20 hours CDT April 22, 2015. The wellbore was completed with 90% of the lateral in target, opening 9,498' (measurement taken from uncased lateral portion) of potentially productive reservoir rock. The hole was then circulated and reamed for completion.

SUMMARY

The Kline Federal 5300 31-18 7T is a successful well in Oasis Petroleum's horizontal First Bench Three Forks development program in Baker Field. The project was drilled from surface casing to TD in 14 days. The TD of 20,561' MD was achieved at 14:20 hours CDT April 22, 2015. The well site team worked together to maintain the well bore in the desired target interval for 90% of the lateral, opening 9,498' of potentially productive reservoir rock.

Samples in the First Bench Three Forks were predominantly dolomite which was described as light brown-light brown gray, tan-cream, trace pink in color. It was firm, laminated, with a microsucrosic texture. Rare disseminated pyrite was noted as was occasional intercrystalline porosity. Also noted was *common spotty to rare even light brown oil stain*. Also observed was light green-light gray green, mint green shale that was firm, subblocky, with an earthy texture. Occasional disseminated pyrite was noted as was possible intergranular porosity.

Gas on the Kline Federal 5300 31-18 7T varied according to stratigraphic position and penetration rates which may have reflected increased porosity. The overall gas and hydrocarbon shows were encouraging and indicate a hydrocarbon rich system in the Three Forks.

The Oasis Petroleum North America, LLC. Kline Federal 5300 31-18 7T awaits completion operations to determine its ultimate production potential.

Respectfully submitted,

Michelle R. Baker

Sunburst Consulting, Inc.
April 26, 2015

WELL DATA SUMMARY

OPERATOR:	**Oasis Petroleum North America, LLC**
ADDRESS:	1001 Fannin Suite 1500 Houston, TX 77002
WELL NAME:	**Kline Federal 5300 31-18 7T**
API #:	33-053-06056-00-00
WELL FILE #:	28755
SURFACE LOCATION:	2,490' FSL & 238' FWL Lot 3 Section 18, T153N, R100W
FIELD/ OBJECTIVE:	Baker Field / First Bench Three Forks
COUNTY, STATE	McKenzie County, North Dakota
BASIN:	Williston
WELL TYPE:	First Bench Three Forks
ELEVATION:	GL: 2,008' KB: 2,033'
SPUD/ RE-ENTRY DATE:	March 27, 2014
BOTTOM HOLE LOCATION:	540.92' South & 9,896.97' East of surface location or approx. 1,949.08' FSL & 354.19' FEL, NE SE Sec. 17, T153N, R100W
CLOSURE COORDINATES:	Closure Azimuth: 93.13° Closure Distance: 9,911.74'
TOTAL DEPTH / DATE:	20,561' on April 22, 2015 90% within target interval
TOTAL DRILLING DAYS:	14 days
CONTRACTOR:	Nabors B22

PUMPS:	H&H Triplex (stroke length - 12")
TOOLPUSHERS:	Darren Birkeland, Jesse Tibbits
FIELD SUPERVISORS:	John Gordan, Dan Thompson, Doug Rakstad
CHEMICAL COMPANY:	NOV
MUD ENGINEER:	Adam Fallis, Ken Rockeman
MUD TYPE:	Fresh water in surface hole Diesel invert in curve; Salt water in lateral
MUD LOSSES:	Invert Mud: 344 bbls., Salt Water: Not tracked
PROSPECT GEOLOGIST:	Brendan Hargrove
WELLSITE GEOLOGISTS:	Michelle R. Baker, Zachary Moses
GEOSTEERING SYSTEM:	Sunburst Digital Wellsite Geological System
ROCK SAMPLING:	30' from 8,240' - 20,561' (TD)
SAMPLE EXAMINATION:	Binocular microscope & fluoroscope
SAMPLE CUTS:	Trichloroethylene
GAS DETECTION:	MSI (Mudlogging Systems, Inc.) TGC - total gas with chromatograph Serial Number(s): ML-414
ELECTRIC LOGS:	None
DRILL STEM TESTS:	None
DIRECTIONAL DRILLERS:	RPM John Gordan, Dan Thompson, Doug Rakstad
MWD:	Ryan Directional Services Mike McCammond, Sammy Hayman

CASING: Surface: 9 5/8" 36# J-55 set to 2,137'
Intermediate: 7" 32# P-110 set to 11,063'

SAFETY/ H_2S MONITORING: Total Safety

KEY OFFSET WELLS:

Oasis Petroleum North America, LLC
Ash Federal 5300 11-18T
Lot 1 Section 18, T153N, R100W
McKenzie County, ND
KB: 2,078'

Oasis Petroleum North America, LLC
Kline 5300 11-18H
NENE Section 18 T153N R100W
McKenzie County, ND
KB: 2,079'

Oasis Petroleum North America, LLC
Kline Federal 5300 31-18 15T
Lot 3 Section 18, T153N, R100W
McKenzie County, ND
KB: 2,033'

WELL LOCATION PLAT

OASIS PETROLEUM NORTH AMERICA, LLC
1001 FANNIN, SUITE 1500, HOUSTON, TX 77002
"KLINE FEDERAL 5300 31-18 7T2"
2490 FEET FROM SOUTH LINE AND 238 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 DARYL D KASEMAN, PLS, REGISTRATION NUMBER 3880 ON 4/25/14 AND THE ORIGINAL DOCUMENTS ARE STORED AT THE OFFICES OF INTERSTATE ENGINEERING, INC

0 1000
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✠ - MONUMENT - NOT RECOVERED

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DARYL D. KASEMAN LS-3880

REGISTERED LAND SURVEYOR
DARYL D. KASEMAN
LS-3880
DATE: 4/25/14
NORTH DAKOTA

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

Drawn By: B.H.H. Project No.: S14-09-108.01
Checked By: D.D.K. Date: APR. 2014

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SECTION BREAKDOWN

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2490 FEET FROM SOUTH LINE AND 238 FEET FROM WEST LINE
SECTIONS 17 & 18, T153N, R100W, 5th P.M., MCKENZIE COUNTY, NORTH DAKOTA

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SECTION BREAKDOWN
SECTIONS 17 & 18, T153N, R100W
MCKENZIE COUNTY, NORTH DAKOTA

Drawn By: BJH | Project No.: S14-09-092.01
Checked By: JDM | Date: APR. 2014

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PAD LAYOUT

OASIS PETROLEUM NORTH AMERICA, LLC
1001 FANNIN, SUITE 1500, HOUSTON, TX 77002
"KLINE FEDERAL 5300 31-18 7T2"
2490 FEET FROM SOUTH LINE AND 238 FEET FROM WEST LINE
SECTION 18, T153N, R100W, 5TH P.M., MCKENZIE COUNTY, NORTH DAKOTA

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DARYL D. KASEMAN
LS-3880
DATE: 4/25/14
NORTH DAKOTA

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

V-DITCH DETAIL

Proposed Contours
Original Contours
BERM
DITCH

0 80
1" = 80'

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

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OASIS PETROLEUM NORTH AMERICA, LLC
PAD LAYOUT
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

OASIS PETROLEUM NORTH AMERICA, LLC
1001 FANNIN, SUITE 1500, HOUSTON, TX 77002
"KLINE FEDERAL 5300 31-18 7T2"
2490 FEET FROM SOUTH LINE AND 238 FEET FROM WEST LINE
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SCALE: 1" = 2 MILE

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COUNTY ROAD MAP
SECTION 18, T153N, R100W
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Revision No.	Date	By	Description

TIME VS. DEPTH

Oasis Petroleum North America, LLC

Kline Federal 5300 31-18 7T

MORNING REPORT SUMMARY

Day	Date 2015	Depth (0600 Hrs)	24 Hr Footage	Bit #	WOB (Klbs) RT	RPM (RT)	WOB (Klbs) MM	RPM (MM)	PP	SPM 1	SPM 2	GPM	24 Hr Activity Summary	Formation
0	3/27	2,147'	10'	1	-	-	-	-	-	-	-	-	Skid rig from Kline Federal 5300 31-18 8B. Nipple up BOPs. Service rig. Test BOP, choke lines manifold, accumulate with BLM present (Scott Hicks) spud rig on company time at 10:00 hrs CST on March 26, 2015. Install wear bushing. Pick up BHA. Service rig. TIH. Install rotating head. Drill cement, float @ 2,090', shoe @ 2,137'. Drill vertical hole from 2,137'-2,147'. TOOH. laydown BHA. Pick up BHA. TIH.	-
1	3/28	6,500'	4,353'	2	35	70	25	168	3600	78	78	599	TIH. FIT. Drill and survey vertical hole, sliding as needed, from 2,147'-4,633'. Safety stand-down. Drill and survey vertical hole, sliding as needed, from 4,633'-5,500'.Continual flow checks to confirm well is not taking on salt water returns from the Dakota formation. Drill and survey vertical hole, sliding as needed, from 5,500'-6,400'. Flow check. Drill and survey lateral, sliding as needed, from 6,400'-6,500'. Flow check.	Rierdon
2	3/29	8,273'	1,773'	2	35	70	25	168	3600	78	78	599	Drill and survey vertical hole, sliding as needed, from 6,500'-7,060'. Service rig. Drill and survey vertical hole, sliding as needed, from 7,060'-7,527'. Drill and survey vertical hole, sliding as needed, from 7,527'-8,180'. Service rig. Drill and survey vertical hole, sliding as needed, from 8,180'-8,273'.	Kibbey
3	3/30	9,066'	793'	2	43	70	20	146	3800	79	79	607	Drill and survey, sliding as needed, from 8,273'-8,715'. Service rig. Drill and survey, sliding as needed, from 8,715'-9,066'. Safety stand down- reviewing JSAs, pinch points. Circulate and condition, pump dry job. TOOH for diminished ROP. Remove rotating head install trip nipple. TOOH. Lay down BHA. Pick up BHA. TIH. Slip and cut drilling line. Test tool. TIH.	Charles
4	3/31	10,220'	1,154'	3	40	50	25	140	4000	76	76	584	TIH. Drill and survey vertical hole, sliding as needed, from 9,066'-10,220'. TD vertical hole at 10,220' at 02:00 hrs CST on March 31, 2015. Service rig. Circulate and condition. Pump dry job. TOOH to pick up curve assembly. Remove rotating head, install trip nipple. TOOH. Lay down BHA. Pick up BHA; curve assembly. TIH.	Lodgepole
5	4/1	10,654'	434'	4	25	20	35	154	3500	69	69	530	TIH with curve assembly. Ream and wash through salts from 9,105'-9,150'. TIH. Rotate from 10,220'-10,250'. Reach KOP of 10,250'. Trough for 30 minutes. Orientate and build curve, rotating as needed, from 10,250'-10,654'. Circulate and condition. TOOH due to insufficient build rates.	Lodgepole
6	4/2	11,090'	436'	5	22	15	15	111	2800	60	60	461	Laydown BHA. Pick up new BHA, consisting of new PDC bit and 2.8° motor. TIH. Orientate and build curve, rotating as needed, from 10,654'-10,809'. Rig service. Orientate and build curve, rotating as needed, from 10,809'-11,090'. Intermediate casing point of 11,090' reached at 04:00 hrs CDT on April 2, 2015. Wiper trip. Circulate bottoms up.	Three Forks 1st Bench

MORNING REPORT SUMMARY

Day	Date 2015	Depth (0600 Hrs)	24 Hr Footage	Bit #	WOB (Klbs) RT	RPM (RT)	WOB (Klbs) MM	RPM (MM)	PP	SPM 1	SPM 2	GPM	24 Hr Activity Summary	Formation
7	4/3	11,090'	0'	-	-	-	-	-	-	-	-	-	Circulate and condition. Pump pill. TOOH. Laydown BHA. Pull wear bushing. Rig up casing crew. Hold safety meeting with 3rd party. Run 7" casing. Service rig. Service top drive. Repair broken communication cable on top drive. Run 7" casing. Wash casing to bottom. Rig down casing crew. Rig up cement crew. Circulate cement and displace. Circulate bottoms up. Rig down cement crew. Circulate cement.	Three Forks 1st Bench
8	4/4	11,090'	0'	-	-	-	-	-	-	-	-	-	Primary cementing. Rig down cement head. Nipple down BOPs. Set casing slips. Cut casing off and prep casing. Nipple down. Prepare rig to skid. Rig released at 14:30 hrs CDT on April 3, 2015. Skid rig.	Three Forks 1st Bench
9	4/18	11,090'	0'	-	-	-	-	-	-	-	-	-	Skid rig. Install night cap on the Oasis Kline Federal 5300 31-18 6B. Rig up catwalk and flow lines. Rig accepted to the Oasis Kline Federal 5300 31-18 7T at 22:00 CDT company time on April 17, 2015. Nipple up BOPs. Service rig. Test BOPs.	Three Forks 1st Bench
10	4/19	12,407'	1,317'	6	19	30	70	265	3600	-	94	331	Test BOPs. Service top drive. Pick up lateral BHA. TIH. Fill pipe. Install rotating head, change saver sub. Drill cement; float @ 10,986', shoe @ 11,063'. FIT to 1800 psi for 15 min. Good test results. Drill and survey lateral, sliding as needed, from 11,090'-11,228'. Drill and survey lateral, sliding as needed, from 11,228'-12,407'. Rig service.	Three Forks 1st Bench
11	4/20	15,631'	3,224'	6	24	40	70	226	3900	-	80	282	Drill and survey lateral, sliding as needed, from 12,407'-13,924'. Service top drive. Drill and survey lateral, sliding as needed, from 13,924'-15,631'. Rig service.	Three Forks 1st Bench
12	4/21	17,812'	2,181'	6	17	40	50	226	4000	-	80	282	Drill and survey lateral, sliding as needed, from 15,631'-16,390'. Rig service. Drill and survey lateral, sliding as needed, from 16,390'-17,559'. Rig service. Drill and survey lateral, sliding as needed, from 17,559'-17,812'.	Three Forks 1st Bench
13	4/22	20,118'	2,306'	6	25	40	75	214	4000	-	76	267	Drill and survey lateral, sliding as needed, from 17,812'-18,476'. Rig service. Drill and survey lateral, sliding as needed, from 18,476'-19,726'. Rig service. Drill and survey lateral, sliding as needed, from 19,726'-20,118'.	Three Forks 1st Bench
14	4/23	20,561'	443'	6	25	40	75	214	4000	-	76	267	Drill and survey lateral, sliding as needed, from 20,118'-20,561'. TD of 20,561' reached at 14:20 hrs CDT on April 22, 2015. Short trip. Circulate bottoms up twice. TOOH to set liner and prepare for completion operations.	Three Forks 1st Bench

DAILY MUD SUMMARY

Date 2015	Mud Depth	Mud WT (ppg)	VIS (sec/ qt)	PV (cP)	YP (lbs/ 100 ft^2)	Gels (lbs/ 100 ft^2)	600/ 300	NAP/ H_20 (ratio)	NAP/ H_20 (% by vol)	Cake (API/ HTHP)	Cor. Solids (%)	Oil/ H_20 (%)	Alk	pH	Excess Lime (lb/bbl)	Cl^- (mg/L)	LGS/ HGS (%)	Salinity (ppm)	Electrical Stability	Gain/ Loss (bbls)
03/27	2,147'	9.4	76	11	6	6/8/9	28/17	80/20	72/18	2	7.9	-	2	-	2.6	34k	6.4/3.9	237392	674	-
03/28	2,205'	9.4	76	11	6	6/8/9	28/17	80/20	72/18	2	7.9	-	2	-	2.6	34k	6.4/3.9	237392	674	-
03/29	7,010'	9.7	61	18	10	10/14/15	46/28	78.2/21.8	68/19	1	11.1	-	2.7	-	3.5	32k	6.2/4.8	217257	576	-/53
03/30	8,275'	10.1	59	17	10	9/16/17	44/27	80/20	68/17	2	13.1	-	2.6	-	3.4	31k	7.8/5.3	231075	617	-/98
03/31	9,207'	10.15	70	18	10	10/15/17	46/28	81.4/18.6	70/16	2	12.2	-	3.2	-	4.1	30k	7.4/4.8	236058	592	-/53
04/01	10,225'	10.4	70	21	10	11/16/17	52/31	81.4/18.6	70/16	1	12.1	-	2.9	-	3.8	31k	8.2/3.9	242022	589	-/118
04/02	10,654'	10.5	82	21	11	11/17/19	53/32	80/20	68/17	2	13.3	-	3.1	-	4	28k	8.4/4.9	223844	671	-/22
04/03	11,090'	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
04/04	11,090'	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
04/18	11,090'	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
04/19	11,097'	9.7	28	1	1	-	3/2	-	-	-/3	10.2	0/90.7	-	9	-	139k	-/0.4	-	-	-
04/20	15,631'	9.7	28	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
04/21	16,264'	9.68	30	1	1	-	3/2	-	-	-	9.2	0/90.8	-	8	-	140k	-/0.6	-	-	-
04/22	20,214'	9.6	30	1	1	-	3/2	-	-	-	8.8	0/91.2	-	8	-	140k	-/0.4	-	-	-
04/23	20,561'	9.6	30	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

BOTTOM HOLE ASSEMBLY RECORD

Bit Data											Motor Data				Reason For Removal
Bit #	Size (in.)	Type	Make	Model	Depth In	Depth Out	Footage	Hours	Σ hrs	Vert. Dev.	Make	Model	Bend	Rev/Gal	
1	12 1/4	PDC	Atlas Copco	-	2,137'	2,147'	10'	1	1	Vertical	-	-	-	-	Drill cement
2	8 3/4	PDC	Reed	DS616M	2,147'	9,066'	6,919'	57	58	Vertical	Predator	PRD6-011	1.50°	0.28	Low ROP
3	8 3/4	PDC	Security	MM65D	9,066'	10,220'	1,154'	18	76	Vertical	Hunting	7/8 5.7	1.50°	0.24	TD vertical
4	8 3/4	PDC	Security	MMD55D	10,220'	10,654'	434'	12	88	Curve	NOV	7/8 5.0	2.38°	0.29	Build rates
5	8 3/4	PDC	Security	MMD55D	10,654'	11,090'	436'	15	103	Curve	Hunting	7/8 5.7	2.60°	0.24	TD curve
6	6	PDC	Smith	PDC#JR1584	11,090'	20,561'	9,471'	90	193	Lateral	Ryan	6/7 8.0	1.50°	0.8	TD well

SUNBURST CONSULTING
A GEOLOGY SERVICE

PLAN VIEW

Note: 1,280 acre laydown spacing unit with 500' N/S & 200' E/W setbacks

Oasis Petroleum North America LLC
Kline Federal 5300 31-18 7T
Surface Location
2,490' FSL & 238' FWL
Lot 3 Sec. 18, T153N, R100W

Bottom Hole Location
540.92' S & 9,896.97' E
of surface location or approx.
1,949.08' FSL & 354.19' FEL
NE SE Sec. 17, T153N, R100W

Oasis Petroleum
Kline Federal 5300 31-
2,490' FSL & 238' FWL
Lot 3 Sec. 18, T153N, R100W
McKenzie County, ND

Gross apparent dip = -0.08°

Oasis Petroleum North America LLC
Kline Federal 5300 31-18 7T
Lot 3 Sec. 18, T153N, R100W
McKenzie County, ND

SUNBURST CONSULTING
A GEOLOGY SERVICE

PROFILE

FORMATION MARKERS & DIP ESTIMATES

Oasis Petroleum North America LLC - Kline Federal 5300 31-18 7T

Dip Change Points	MD	TVD	TVD diff.	MD diff.	Dip	Dipping up/down	Type of Marker
Marker							
Initial Target Entry	10,952'	10,772.00					Gamma
Marker C	11,090'	10,772.00	0.00	138.00	***0.00***	Flat	Gamma
Marker E	11,750'	10,776.40	4.40	660.00	***-0.38***	Down	Gamma
Marker E	13,180'	10,783.50	7.10	1430.00	***-0.28***	Down	Gamma
Marker E	14,213'	10,789.20	5.70	1033.00	***-0.32***	Down	Gamma
Marker E	14,772'	10,789.00	-0.20	559.00	***0.02***	Up	Gamma
Marker C	15,560'	10,789.00	0.00	788.00	***0.00***	Flat	Gamma
Marker C	16,180'	10,794.30	5.30	620.00	***-0.49***	Down	Gamma
Claystone Entry	17,360'	10,801.00	6.70	1180.00	***-0.33***	Down	Gamma
Claystone Exit	17,620'	10,799.15	-1.85	260.00	***0.41***	Up	Gamma
Claystone Entry	18,090'	10,799.80	0.65	470.00	***-0.08***	Down	Gamma
Claystone Exit	18,500'	10,797.00	-2.80	410.00	***0.39***	Up	Gamma
Claystone Entry	19,680'	10,789.50	-7.50	1180.00	***0.36***	Up	Gamma
Claystone Exit	20,260'	10,785.75	-3.75	580.00	***0.37***	Up	Gamma
Marker D	20,561'	10,785.00	-0.75	301.00	***0.14***	Up	Gamma
Gross Dip							
Initial Target Contact	10,952'	10,772.00					
Projected Final Target Contact	20,561'	10,785.00	13.00	9609.00	***-0.08***	Down	Projection

Oasis Petroleum North America LLC
Kline Federal 5300 31-18 7T
Lot 3 Sec. 18, T153N, R100W
McKenzie County, ND

SUNBURST CONSULTING
A GEOLOGY SERVICE

DIP PROFILE

SUNBURST CONSULTING, INC.

Operator:	Oasis Petroleum North America LLC	Kick-off:	3/31/2015
Well:	Kline Federal 5300 31-18 7T	Finish:	4/22/2015
Surface Coordinates:	2,490' FSL & 238' FWL		
Surface Location:	Lot 3 Sec. 18, T153N, R100W	Directional Supervision:	
County State:	McKenzie County, ND	Ryan Directional Services	

Minimum Curvature Method (SPE-3362) Proposed dir 90

[North and East are positive and South and West are negative, relative to surface location]

No.	MD	INC	TRUE AZM	TVD	N-S	E-W	SECT	DLS/ 100
Tie	2061.00	1.20	206.10	2060.88	-7.73	1.76	-7.73	
1	2153.00	1.30	204.10	2152.86	-9.55	0.91	0.91	0.12
2	2246.00	1.40	206.90	2245.83	-11.52	-0.03	-0.03	0.13
3	2340.00	1.20	59.50	2339.82	-12.05	0.29	0.29	2.66
4	2433.00	1.70	64.00	2432.79	-10.95	2.37	2.37	0.55
5	2526.00	1.80	62.50	2525.75	-9.67	4.91	4.91	0.12
6	2620.00	0.60	349.70	2619.73	-8.50	6.13	6.13	1.83
7	2713.00	0.50	331.60	2712.73	-7.67	5.85	5.85	0.21
8	2807.00	0.40	322.60	2806.72	-7.05	5.46	5.46	0.13
9	2900.00	0.40	332.30	2899.72	-6.50	5.11	5.11	0.07
10	2993.00	0.70	348.40	2992.72	-5.66	4.84	4.84	0.36
11	3087.00	0.60	332.20	3086.71	-4.66	4.50	4.50	0.22
12	3180.00	0.70	345.00	3179.71	-3.68	4.12	4.12	0.19
13	3274.00	0.70	341.20	3273.70	-2.58	3.79	3.79	0.05
14	3367.00	0.60	344.80	3366.69	-1.57	3.48	3.48	0.12
15	3460.00	0.70	341.10	3459.69	-0.57	3.17	3.17	0.12
16	3554.00	0.90	346.60	3553.68	0.69	2.81	2.81	0.23
17	3647.00	0.90	346.90	3646.67	2.12	2.48	2.48	0.01
18	3741.00	0.80	349.90	3740.66	3.48	2.19	2.19	0.12
19	3834.00	0.60	348.40	3833.65	4.60	1.98	1.98	0.22
20	3927.00	0.60	7.40	3926.64	5.56	1.95	1.95	0.21
21	4021.00	0.40	355.30	4020.64	6.37	1.98	1.98	0.24
22	4114.00	0.50	343.20	4113.64	7.08	1.84	1.84	0.15
23	4208.00	0.40	203.80	4207.64	7.18	1.59	1.59	0.90
24	4301.00	0.60	220.00	4300.63	6.51	1.14	1.14	0.26
25	4394.00	0.60	236.60	4393.63	5.87	0.42	0.42	0.19
26	4488.00	0.30	249.60	4487.62	5.51	-0.22	-0.22	0.34
27	4581.00	0.30	247.10	4580.62	5.33	-0.67	-0.67	0.01
28	4675.00	0.10	1.80	4674.62	5.32	-0.89	-0.89	0.38
29	4768.00	0.40	21.10	4767.62	5.70	-0.77	-0.77	0.33
30	4861.00	0.70	106.80	4860.62	5.84	-0.11	-0.11	0.84
31	4955.00	0.30	97.80	4954.61	5.64	0.68	0.68	0.43
32	5048.00	0.40	176.10	5047.61	5.28	0.94	0.94	0.48
33	5141.00	0.30	259.50	5140.61	4.91	0.73	0.73	0.51
34	5235.00	0.50	225.50	5234.61	4.58	0.19	0.19	0.32
35	5328.00	0.80	226.70	5327.60	3.85	-0.57	-0.57	0.32
36	5422.00	0.70	242.10	5421.60	3.13	-1.56	-1.56	0.24
37	5515.00	0.90	257.20	5514.59	2.71	-2.77	-2.77	0.31

SUNBURST CONSULTING, INC.

Operator:	Oasis Petroleum North America LLC	Kick-off:	3/31/2015
Well:	Kline Federal 5300 31-18 7T	Finish:	4/22/2015
Surface Coordinates:	2,490' FSL & 238' FWL		
Surface Location:	Lot 3 Sec. 18, T153N, R100W	Directional Supervision:	
County State:	McKenzie County, ND	Ryan Directional Services	

Minimum Curvature Method (SPE-3362) Proposed dir 90

[North and East are positive and South and West are negative, relative to surface location]

No.	MD	INC	TRUE AZM	TVD	N-S	E-W	SECT	DLS/ 100
38	5608.00	0.60	263.30	5607.58	2.49	-3.97	-3.97	0.33
39	5702.00	0.70	270.70	5701.57	2.44	-5.03	-5.03	0.14
40	5795.00	0.90	185.10	5794.57	1.72	-5.66	-5.66	1.18
41	5888.00	0.90	192.30	5887.55	0.27	-5.88	-5.88	0.12
42	5982.00	0.70	195.90	5981.55	-1.00	-6.20	-6.20	0.22
43	6075.00	0.70	211.30	6074.54	-2.03	-6.65	-6.65	0.20
44	6168.00	0.60	204.00	6167.53	-2.96	-7.14	-7.14	0.14
45	6262.00	0.80	190.80	6261.53	-4.06	-7.46	-7.46	0.27
46	6355.00	0.60	130.20	6354.52	-5.01	-7.21	-7.21	0.78
47	6448.00	1.30	145.30	6447.51	-6.19	-6.24	-6.24	0.79
48	6542.00	1.60	150.70	6541.48	-8.21	-4.99	-4.99	0.35
49	6635.00	1.90	150.90	6634.43	-10.69	-3.61	-3.61	0.32
50	6728.00	1.30	148.30	6727.40	-12.93	-2.30	-2.30	0.65
51	6822.00	1.40	127.10	6821.37	-14.53	-0.83	-0.83	0.54
52	6915.00	0.80	118.50	6914.35	-15.53	0.65	0.65	0.67
53	7008.00	0.70	45.90	7007.35	-15.44	1.63	1.63	0.96
54	7102.00	1.50	29.90	7101.33	-13.98	2.65	2.65	0.90
55	7195.00	1.50	35.10	7194.30	-11.93	3.96	3.96	0.15
56	7288.00	1.60	32.00	7287.26	-9.83	5.35	5.35	0.14
57	7381.00	1.50	26.20	7380.23	-7.64	6.57	6.57	0.20
58	7475.00	1.60	26.00	7474.19	-5.35	7.69	7.69	0.11
59	7568.00	0.70	353.40	7567.18	-3.62	8.20	8.20	1.16
60	7661.00	0.70	344.30	7660.17	-2.51	7.98	7.98	0.12
61	7755.00	0.20	325.80	7754.17	-1.82	7.73	7.73	0.55
62	7848.00	0.00	295.70	7847.17	-1.69	7.64	7.64	0.22
63	7941.00	0.40	320.30	7940.16	-1.44	7.43	7.43	0.43
64	8034.00	0.30	165.50	8033.16	-1.42	7.28	7.28	0.73
65	8128.00	0.20	189.00	8127.16	-1.82	7.32	7.32	0.15
66	8221.00	0.40	132.50	8220.16	-2.20	7.53	7.53	0.36
67	8315.00	0.10	137.20	8314.16	-2.49	7.83	7.83	0.32
68	8408.00	0.30	145.20	8407.16	-2.74	8.03	8.03	0.22
69	8501.00	0.50	159.10	8500.16	-3.32	8.31	8.31	0.24
70	8595.00	0.20	173.90	8594.16	-3.87	8.47	8.47	0.33
71	8688.00	0.30	126.00	8687.16	-4.17	8.69	8.69	0.24
72	8781.00	0.40	104.70	8780.15	-4.40	9.20	9.20	0.17
73	8875.00	0.40	98.40	8874.15	-4.53	9.84	9.84	0.05
74	8968.00	0.40	110.90	8967.15	-4.69	10.47	10.47	0.09
75	9061.00	0.40	89.00	9060.15	-4.80	11.09	11.09	0.16

SUNBURST CONSULTING, INC.

Operator:	Oasis Petroleum North America LLC	Kick-off:	3/31/2015
Well:	Kline Federal 5300 31-18 7T	Finish:	4/22/2015
Surface Coordinates:	2,490' FSL & 238' FWL		
Surface Location:	Lot 3 Sec. 18, T153N, R100W	Directional Supervision:	
County State:	McKenzie County, ND	Ryan Directional Services	

Minimum Curvature Method (SPE-3362) Proposed dir 90

[North and East are positive and South and West are negative, relative to surface location]

No.	MD	INC	TRUE AZM	TVD	N-S	E-W	SECT	DLS/ 100
76	9154.00	0.30	107.10	9153.15	-4.87	11.65	11.65	0.16
77	9248.00	0.40	98.50	9247.14	-4.99	12.21	12.21	0.12
78	9341.00	0.40	132.10	9340.14	-5.26	12.77	12.77	0.25
79	9434.00	0.40	130.00	9433.14	-5.68	13.26	13.26	0.02
80	9528.00	0.50	101.20	9527.14	-5.97	13.92	13.92	0.26
81	9621.00	0.40	132.10	9620.13	-6.27	14.55	14.55	0.28
82	9714.00	0.40	112.90	9713.13	-6.61	15.09	15.09	0.14
83	9807.00	0.10	108.80	9806.13	-6.77	15.47	15.47	0.32
84	9901.00	0.30	3.60	9900.13	-6.55	15.56	15.56	0.36
85	9994.00	0.30	337.50	9993.13	-6.08	15.49	15.49	0.15
86	10087.00	0.50	346.70	10086.13	-5.46	15.30	15.30	0.23
87	10162.00	0.40	3.60	10161.12	-4.88	15.24	15.24	0.22
88	10219.00	0.90	339.00	10218.12	-4.26	15.09	15.09	0.99
89	10250.00	0.80	75.50	10249.12	-3.98	15.21	15.21	4.10
90	10281.00	3.70	109.70	10280.09	-4.27	16.37	16.37	9.91
91	10312.00	7.30	114.40	10310.94	-5.42	19.10	19.10	11.69
92	10343.00	11.10	115.90	10341.54	-7.53	23.58	23.58	12.28
93	10375.00	14.10	115.90	10372.77	-10.58	29.86	29.86	9.38
94	10406.00	16.20	116.30	10402.69	-14.15	37.13	37.13	6.78
95	10437.00	18.50	117.60	10432.27	-18.34	45.37	45.37	7.52
96	10468.00	21.30	120.10	10461.42	-23.45	54.60	54.60	9.44
97	10499.00	24.40	120.50	10489.98	-29.52	64.99	64.99	10.01
98	10530.00	28.00	122.40	10517.80	-36.67	76.66	76.66	11.92
99	10561.00	30.30	122.50	10544.87	-44.78	89.40	89.40	7.42
100	10593.00	32.70	120.00	10572.15	-53.44	103.70	103.70	8.54
101	10624.00	36.10	117.90	10597.73	-61.90	119.02	119.02	11.61
102	10655.00	39.50	118.90	10622.22	-70.94	135.73	135.73	11.14
103	10686.00	44.00	120.30	10645.34	-81.14	153.67	153.67	14.82
104	10717.00	49.40	121.40	10666.59	-92.72	173.03	173.03	17.61
105	10748.00	53.90	122.60	10685.82	-105.60	193.63	193.63	14.83
106	10779.00	57.30	122.60	10703.33	-119.38	215.18	215.18	10.97
107	10811.00	58.40	122.70	10720.36	-134.00	237.99	237.99	3.45
108	10842.00	61.80	122.10	10735.81	-148.39	260.68	260.68	11.10
109	10873.00	66.40	121.50	10749.35	-163.08	284.37	284.37	14.94
110	10904.00	72.00	121.60	10760.36	-178.24	309.06	309.06	18.07
111	10935.00	77.50	121.80	10768.51	-193.95	334.50	334.50	17.75
112	10966.00	82.80	122.60	10773.81	-210.22	360.33	360.33	17.28
113	10997.00	87.60	120.30	10776.40	-226.33	386.68	386.68	17.16

SUNBURST CONSULTING, INC.

Operator:	Oasis Petroleum North America LLC	Kick-off:	3/31/2015
Well:	Kline Federal 5300 31-18 7T	Finish:	4/22/2015
Surface Coordinates:	2,490' FSL & 238' FWL		
Surface Location:	Lot 3 Sec. 18, T153N, R100W	Directional Supervision:	
County State:	McKenzie County, ND	Ryan Directional Services	

Minimum Curvature Method (SPE-3362) Proposed dir 90

[North and East are positive and South and West are negative, relative to surface location]

No.	MD	INC	TRUE AZM	TVD	N-S	E-W	SECT	DLS/ 100
114	11028.00	88.00	117.50	10777.59	-241.30	413.79	413.79	9.12
115	11072.00	87.40	120.40	10779.36	-262.58	452.26	452.26	6.73
116	11104.00	88.60	118.10	10780.47	-278.20	480.16	480.16	8.10
117	11134.00	90.10	117.40	10780.81	-292.17	506.71	506.71	5.52
118	11164.00	90.20	116.30	10780.74	-305.72	533.47	533.47	3.68
119	11195.00	90.60	115.00	10780.52	-319.14	561.42	561.42	4.39
120	11226.00	90.60	113.60	10780.19	-331.89	589.67	589.67	4.52
121	11258.00	91.00	112.30	10779.75	-344.37	619.13	619.13	4.25
122	11288.00	91.30	112.10	10779.15	-355.70	646.90	646.90	1.20
123	11318.00	90.70	110.00	10778.62	-366.48	674.89	674.89	7.28
124	11348.00	90.10	109.60	10778.41	-376.64	703.12	703.12	2.40
125	11379.00	89.20	109.10	10778.60	-386.91	732.37	732.37	3.32
126	11410.00	89.90	107.90	10778.85	-396.74	761.76	761.76	4.48
127	11440.00	89.30	108.30	10779.06	-406.06	790.28	790.28	2.40
128	11472.00	88.40	107.80	10779.70	-415.98	820.70	820.70	3.22
129	11503.00	87.60	106.40	10780.78	-425.09	850.31	850.31	5.20
130	11533.00	87.60	106.70	10782.04	-433.63	879.04	879.04	1.00
131	11563.00	88.60	105.20	10783.03	-441.86	907.87	907.87	6.01
132	11594.00	89.30	102.60	10783.60	-449.31	937.95	937.95	8.68
133	11624.00	89.40	102.50	10783.94	-455.83	967.23	967.23	0.47
134	11655.00	89.10	102.20	10784.34	-462.46	997.51	997.51	1.37
135	11687.00	90.00	100.50	10784.60	-468.75	1028.88	1028.88	6.01
136	11718.00	90.70	100.40	10784.41	-474.38	1059.37	1059.37	2.28
137	11750.00	91.20	99.90	10783.88	-480.02	1090.86	1090.86	2.21
138	11781.00	91.50	97.40	10783.15	-484.68	1121.50	1121.50	8.12
139	11813.00	91.70	96.80	10782.25	-488.63	1153.24	1153.24	1.98
140	11844.00	91.90	96.40	10781.28	-492.19	1184.02	1184.02	1.44
141	11875.00	92.40	95.10	10780.12	-495.30	1214.84	1214.84	4.49
142	11906.00	92.00	94.00	10778.93	-497.75	1245.72	1245.72	3.77
143	11936.00	91.20	93.60	10778.09	-499.74	1275.64	1275.64	2.98
144	11967.00	89.70	93.10	10777.84	-501.55	1306.59	1306.59	5.10
145	11997.00	91.10	93.20	10777.63	-503.20	1336.54	1336.54	4.68
146	12028.00	91.40	92.80	10776.96	-504.82	1367.49	1367.49	1.61
147	12059.00	91.70	92.90	10776.12	-506.36	1398.44	1398.44	1.02
148	12153.00	90.10	91.50	10774.64	-509.97	1492.36	1492.36	2.26
149	12248.00	88.50	90.50	10775.80	-511.63	1587.33	1587.33	1.99
150	12343.00	88.10	90.30	10778.62	-512.29	1682.29	1682.29	0.47
151	12438.00	90.00	90.90	10780.20	-513.29	1777.26	1777.26	2.10

SUNBURST CONSULTING, INC.

Operator:	Oasis Petroleum North America LLC	Kick-off:	3/31/2015
Well:	Kline Federal 5300 31-18 7T	Finish:	4/22/2015
Surface Coordinates:	2,490' FSL & 238' FWL		
Surface Location:	Lot 3 Sec. 18, T153N, R100W	Directional Supervision:	
County State:	McKenzie County, ND	Ryan Directional Services	

Minimum Curvature Method (SPE-3362) Proposed dir 90

[North and East are positive and South and West are negative, relative to surface location]

No.	MD	INC	TRUE AZM	TVD	N-S	E-W	SECT	DLS/ 100
152	12533.00	91.60	91.00	10778.87	-514.86	1872.24	1872.24	1.69
153	12628.00	89.00	88.70	10778.37	-514.61	1967.22	1967.22	3.65
154	12722.00	88.90	87.90	10780.10	-511.82	2061.16	2061.16	0.86
155	12817.00	88.20	89.80	10782.50	-509.92	2156.11	2156.11	2.13
156	12912.00	88.10	88.40	10785.57	-508.43	2251.04	2251.04	1.48
157	13007.00	88.70	88.60	10788.22	-505.94	2345.97	2345.97	0.67
158	13102.00	89.10	89.00	10790.04	-503.95	2440.94	2440.94	0.60
159	13197.00	89.70	88.50	10791.04	-501.88	2535.91	2535.91	0.82
160	13291.00	92.00	88.00	10789.64	-499.01	2629.85	2629.85	2.50
161	13386.00	89.70	90.00	10788.23	-497.35	2724.81	2724.81	3.21
162	13481.00	89.00	90.70	10789.31	-497.93	2819.80	2819.80	1.04
163	13576.00	89.90	92.20	10790.22	-500.34	2914.76	2914.76	1.84
164	13671.00	90.10	92.30	10790.22	-504.07	3009.69	3009.69	0.24
165	13765.00	89.50	91.40	10790.55	-507.10	3103.64	3103.64	1.15
166	13860.00	89.50	91.70	10791.38	-509.67	3198.60	3198.60	0.32
167	13955.00	89.60	91.60	10792.13	-512.40	3293.56	3293.56	0.15
168	14050.00	89.00	92.10	10793.29	-515.47	3388.50	3388.50	0.82
169	14145.00	88.90	91.80	10795.03	-518.70	3483.43	3483.43	0.33
170	14240.00	90.30	90.90	10795.69	-520.94	3578.40	3578.40	1.75
171	14335.00	92.10	90.80	10793.70	-522.35	3673.36	3673.36	1.90
172	14429.00	91.80	90.70	10790.50	-523.58	3767.30	3767.30	0.34
173	14524.00	89.40	90.50	10789.51	-524.57	3862.28	3862.28	2.54
174	14619.00	88.90	91.40	10790.92	-526.15	3957.26	3957.26	1.08
175	14714.00	87.40	90.90	10793.99	-528.06	4052.19	4052.19	1.66
176	14809.00	90.00	90.40	10796.14	-529.13	4147.15	4147.15	2.79
177	14904.00	91.50	90.70	10794.90	-530.04	4242.13	4242.13	1.61
178	14998.00	90.00	88.70	10793.67	-529.55	4336.11	4336.11	2.66
179	15093.00	89.80	88.50	10793.83	-527.23	4431.09	4431.09	0.30
180	15188.00	89.70	88.70	10794.25	-524.91	4526.06	4526.06	0.24
181	15283.00	90.30	86.90	10794.25	-521.26	4620.98	4620.98	2.00
182	15378.00	91.90	87.00	10792.42	-516.21	4715.83	4715.83	1.69
183	15473.00	90.30	89.90	10790.60	-513.64	4810.76	4810.76	3.49
184	15567.00	92.40	89.40	10788.38	-513.07	4904.73	4904.73	2.30
185	15662.00	90.90	91.00	10785.65	-513.40	4999.68	4999.68	2.31
186	15694.00	90.50	91.10	10785.26	-513.99	5031.67	5031.67	1.29
187	15725.00	91.20	91.70	10784.80	-514.74	5062.66	5062.66	2.97
188	15757.00	89.40	92.10	10784.63	-515.80	5094.64	5094.64	5.76
189	15789.00	88.90	91.40	10785.11	-516.78	5126.62	5126.62	2.69

SUNBURST CONSULTING, INC.

Operator:	Oasis Petroleum North America LLC	Kick-off:	3/31/2015
Well:	Kline Federal 5300 31-18 7T	Finish:	4/22/2015
Surface Coordinates:	2,490' FSL & 238' FWL		
Surface Location:	Lot 3 Sec. 18, T153N, R100W	Directional Supervision:	
County State:	McKenzie County, ND	Ryan Directional Services	

Minimum Curvature Method (SPE-3362) Proposed dir 90

[North and East are positive and South and West are negative, relative to surface location]

No.	MD	INC	TRUE AZM	TVD	N-S	E-W	SECT	DLS/ 100
190	15820.00	88.00	92.10	10785.94	-517.73	5157.60	5157.60	3.68
191	15852.00	88.40	92.30	10786.95	-518.96	5189.56	5189.56	1.40
192	15883.00	88.70	91.70	10787.73	-520.04	5220.53	5220.53	2.16
193	15915.00	88.70	92.00	10788.46	-521.07	5252.50	5252.50	0.94
194	15947.00	89.60	92.20	10788.93	-522.24	5284.48	5284.48	2.88
195	15978.00	90.10	92.60	10789.02	-523.54	5315.45	5315.45	2.07
196	16010.00	90.60	92.60	10788.82	-524.99	5347.42	5347.42	1.56
197	16041.00	90.00	91.40	10788.66	-526.07	5378.40	5378.40	4.33
198	16073.00	88.10	90.80	10789.19	-526.69	5410.39	5410.39	6.23
199	16105.00	87.10	91.90	10790.53	-527.44	5442.35	5442.35	4.64
200	16136.00	87.40	91.80	10792.02	-528.44	5473.30	5473.30	1.02
201	16168.00	87.80	91.10	10793.36	-529.25	5505.26	5505.26	2.52
202	16199.00	87.60	91.40	10794.60	-529.93	5536.23	5536.23	1.16
203	16231.00	87.70	91.10	10795.91	-530.62	5568.19	5568.19	0.99
204	16263.00	87.60	91.40	10797.22	-531.32	5600.16	5600.16	0.99
205	16294.00	87.60	91.50	10798.52	-532.10	5631.12	5631.12	0.32
206	16326.00	89.30	91.40	10799.39	-532.91	5663.10	5663.10	5.32
207	16421.00	88.10	90.90	10801.54	-534.82	5758.05	5758.05	1.37
208	16516.00	91.70	90.10	10801.71	-535.65	5853.03	5853.03	3.88
209	16610.00	88.70	88.60	10801.38	-534.58	5947.01	5947.01	3.57
210	16705.00	88.70	88.50	10803.54	-532.18	6041.95	6041.95	0.11
211	16800.00	88.70	89.20	10805.69	-530.27	6136.91	6136.91	0.74
212	16895.00	89.90	89.00	10806.85	-528.78	6231.89	6231.89	1.28
213	16989.00	89.50	88.10	10807.34	-526.40	6325.86	6325.86	1.05
214	17084.00	89.20	88.90	10808.42	-523.92	6420.82	6420.82	0.90
215	17179.00	88.80	88.60	10810.08	-521.84	6515.78	6515.78	0.53
216	17274.00	89.90	89.70	10811.16	-520.43	6610.76	6610.76	1.64
217	17369.00	89.10	90.20	10811.99	-520.35	6705.76	6705.76	0.99
218	17464.00	90.40	89.80	10812.40	-520.35	6800.75	6800.75	1.43
219	17558.00	91.30	89.90	10811.01	-520.11	6894.74	6894.74	0.96
220	17653.00	90.50	91.40	10809.51	-521.18	6989.72	6989.72	1.79
221	17748.00	90.30	91.50	10808.85	-523.59	7084.69	7084.69	0.24
222	17843.00	90.50	90.80	10808.19	-525.49	7179.67	7179.67	0.77
223	17937.00	89.10	91.60	10808.52	-527.46	7273.64	7273.64	1.72
224	18032.00	89.10	91.80	10810.01	-530.28	7368.59	7368.59	0.21
225	18127.00	89.20	92.20	10811.42	-533.59	7463.52	7463.52	0.43
226	18222.00	89.90	91.10	10812.16	-536.33	7558.47	7558.47	1.37
227	18317.00	90.30	89.90	10812.00	-537.16	7653.47	7653.47	1.33

SUNBURST CONSULTING, INC.

Operator:	Oasis Petroleum North America LLC	Kick-off:	3/31/2015
Well:	Kline Federal 5300 31-18 7T	Finish:	4/22/2015
Surface Coordinates:	2,490' FSL & 238' FWL		
Surface Location:	Lot 3 Sec. 18, T153N, R100W	Directional Supervision:	
County State:	McKenzie County, ND	Ryan Directional Services	

Minimum Curvature Method (SPE-3362) Proposed dir 90

[North and East are positive and South and West are negative, relative to surface location]

No.	MD	INC	TRUE AZM	TVD	N-S	E-W	SECT	DLS/ 100
228	18412.00	91.80	90.50	10810.26	-537.49	7748.45	7748.45	1.70
229	18506.00	91.60	90.10	10807.47	-537.98	7842.41	7842.41	0.48
230	18601.00	91.40	89.00	10804.98	-537.24	7937.37	7937.37	1.18
231	18695.00	90.90	89.80	10803.10	-536.25	8031.34	8031.34	1.00
232	18790.00	90.70	89.00	10801.77	-535.26	8126.33	8126.33	0.87
233	18885.00	90.20	90.30	10801.02	-534.68	8221.32	8221.32	1.47
234	18980.00	91.90	90.50	10799.28	-535.34	8316.30	8316.30	1.80
235	19075.00	89.80	89.70	10797.87	-535.51	8411.28	8411.28	2.37
236	19169.00	90.20	90.60	10797.87	-535.75	8505.28	8505.28	1.05
237	19264.00	90.10	89.90	10797.62	-536.17	8600.28	8600.28	0.74
238	19359.00	91.10	90.20	10796.63	-536.25	8695.27	8695.27	1.10
239	19454.00	89.50	90.20	10796.13	-536.58	8790.27	8790.27	1.68
240	19549.00	89.80	90.10	10796.71	-536.83	8885.27	8885.27	0.33
241	19643.00	87.40	91.50	10799.01	-538.14	8979.22	8979.22	2.96
242	19738.00	89.10	90.90	10801.91	-540.13	9074.15	9074.15	1.90
243	19833.00	89.80	90.80	10802.82	-541.54	9169.14	9169.14	0.74
244	19928.00	90.90	89.20	10802.24	-541.54	9264.13	9264.13	2.04
245	20023.00	90.50	89.60	10801.08	-540.54	9359.12	9359.12	0.60
246	20117.00	91.80	89.00	10799.19	-539.40	9453.09	9453.09	1.52
247	20212.00	90.90	90.50	10796.96	-538.98	9548.06	9548.06	1.84
248	20307.00	89.80	90.00	10796.38	-539.40	9643.05	9643.05	1.27
249	20402.00	92.00	90.10	10794.88	-539.48	9738.04	9738.04	2.32
250	20497.00	91.30	90.70	10792.15	-540.14	9832.99	9832.99	0.97
251	20561.00	91.30	90.70	10790.70	-540.92	9896.97	9896.97	0.00

DEVIATION SURVEYS

Depth	Inclination	Azimuth
132	0.2	88.5
245	0.7	108.5
314	0.7	98.7
407	0.9	96
493	0.9	84.2
579	0.7	83.8
669	0.6	121.6
751	0.9	108.9
839	0.6	117.4
927	0.3	149
1013	0.1	48.4
1100	0.5	256.5
1189	0.6	237.1
1276	0.5	212
1364	0.4	249.9
1450	0.4	315
1536	0.5	278
1623	0.7	234
1711	0.7	235.1
1799	0.6	252.6
1886	0.8	199.7
1974	0.9	206.2
2061	1.2	206.1

FORMATION TOPS & STRUCTURAL RELATIONSHIPS

Operator:	Subject Well:									Offset Well:		
Well Name:	Oasis Petroleum North America, LLC											
	Kline Federal 5300 31-18 7T											
Location:	2,490' FSL & 238' FWL											
	Lot 3 Section 18, T153N, R100W											
Elevation:	GL: 2,008'	Sub: 25'	KB: 2,033'									
Formation/ Marker	Prog. Top	Prog. Datum (MSL)	Driller's Depth Top (MD)	Driller's Depth Top (TVD)	E-Log Top (TVD)	Datum (MSL)	Interval Thickness	Thickness to Target	Dip To Prog.	Dip To Ash Federal 5300 11-18T	Dip To Kline 5300 11-18H	Dip To Kline Federal 5300 31-18 15T
Kibbey Lime	8,320'	-6,287'	8,326'	8,325'	-	-6,292'	145'	2,452'	-5'	-24'	0'	-5'
Charles Salt	8,462'	-6,429'	8,471'	8,470'	-	-6,437'	616'	2,307'	-8'	-24'	3'	-8'
UB	9,110'	-7,077'	9,087'	9,086'	-	-7,053'	67'	1,691'	24'	-28'	9'	-1'
Base of Last Salt	9,152'	-7,119'	9,154'	9,153'	-	-7,120'	30'	1,624'	-1'	-11'	17'	-1'
Ratcliffe	9,180'	-7,147'	9,184'	9,183'	-	-7,150'	209'	1,594'	-3'	-8'	35'	-3'
Mission Canyon	9,390'	-7,357'	9,393'	9,392'	-	-7,359'	546'	1,385'	-2'	-23'	2'	-2'
Lodgepole	9,946'	-7,913'	9,939'	9,938'	-	-7,905'	107'	839'	8'	-19'	12'	8'
LP A	-	-	10,046'	10,045'	-	-8,012'	108'	732'	-	-	8'	-1'
LP Fracture Zone	10,147'	-8,114'	10,154'	10,153'	-	-8,120'	17'	624'	-6'	-	21'	-6'
LP C	-	-	10,171'	10,170'	-	-8,137'	193'	607'	-	-	41'	-2'
LP D	-	-	10,364'	10,363'	-	-8,330'	137'	414'	-	-15'	1'	-6'
LP E	-	-	10,510'	10,500'	-	-8,467'	85'	277'	-	-20'	-6'	-2'
LP F	-	-	10,609'	10,585'	-	-8,552'	79'	192'	-	-26'	-14'	-3'
False Bakken	10,660'	-8,627'	10,712'	10,664'	-	-8,631'	2'	113'	-4'	-20'	-13'	-4'
Scallion	-	-	10,716'	10,666'	-	-8,633'	7'	111'	-	-20'	-11'	-4'
Upper Bakken Shale	10,671'	-8,638'	10,727'	10,673'	-	-8,640'	16'	104'	-2'	-23'	-12'	-2'
Middle Bakken	10,687'	-8,654'	10,756'	10,689'	-	-8,656'	44'	88'	-2'	-25'	-13'	-2'
Lower Bakken Shale	10,729'	-8,696'	10,836'	10,733'	-	-8,700'	13'	44'	-4'	-27'	-15'	-4'
Pronghorn	10,740'	-8,707'	10,865'	10,746'	-	-8,713'	14'	31'	-6'	-29'	-17'	-6'
Three Forks	10,753'	-8,720'	10,903'	10,760'	-	-8,727'	12'	17'	-7'	-29'	-17'	-6'
Target Top	10,765'	-8,732'	10,952'	10,772'	-	-8,739'	5'	5'	-7'	-31'	-19'	-8'
Target Landing	-	-	11,013'	10,777'	-	-8,744'	5'	0'	-	-31'	-19'	-8'
Target Bottom	10,775'	-8,742'	-	10,782'	-	-8,749'	-	-5'	-7'	-31'	-19'	-8'
Claystone	10,775'	-8,742'	-	-	-	-	-	-	-	-	-	-

CONTROL DATA

Operator:	Oasis Petroleum North America, LLC				Oasis Petroleum North America, LLC				Oasis Petroleum North America, LLC			
Well Name:	Ash Federal 5300 11-18T				Kline 5300 11-18H				Kline Federal 5300 31-18 15T			
Location:	Lot 1 Section 18, T153N, R100W McKenzie County, ND ~1,900' N of Kline 5300 31-18 15T				NENE Section 18 T153N R100W McKenzie County, ND ~900' N of Kline 5300 31-18 15T				Lot 3 Section 18, T153N, R100W McKenzie County, ND shares pad with subject well			
Elevation:	KB: 2,078'				KB: 2,079'				KB: 2,033'			
Formation/ Zone	**E-Log Top**	**Datum (MSL)**	**Interval Thickness**	**Thickness to Target**	**E-Log Top**	**Datum (MSL)**	**Interval Thickness**	**Thickness to Target**	**E-Log Top**	**Datum (MSL)**	**Interval Thickness**	**Thickness to Target**
Kibbey Lime	8,346'	-6,268'	145'	2,445'	8,371'	-6,292'	148'	2,433'	8,320'	-6,287'	142'	2,449'
Charles Salt	8,491'	-6,413'	612'	2,300'	8,519'	-6,440'	622'	2,285'	8,462'	-6,429'	623'	2,307'
UB	9,103'	-7,025'	84'	1,688'	9,141'	-7,062'	75'	1,663'	9,085'	-7,052'	67'	1,684'
Base of Last Salt	9,187'	-7,109'	33'	1,604'	9,216'	-7,137'	48'	1,588'	9,152'	-7,119'	28'	1,617'
Ratcliffe	9,220'	-7,142'	194'	1,571'	9,264'	-7,185'	176'	1,540'	9,180'	-7,147'	210'	1,589'
Mission Canyon	9,414'	-7,336'	550'	1,377'	9,440'	-7,361'	556'	1,364'	9,390'	-7,357'	556'	1,379'
Lodgepole	9,964'	-7,886'	-	827'	9,996'	-7,917'	103'	808'	9,946'	-7,913'	98'	823'
LP A	-	-	-	-	10,099'	-8,020'	121'	705'	10,044'	-8,011'	103'	725'
LP Fracture Zone	-	-	-	-	10,220'	-8,141'	37'	584'	10,147'	-8,114'	21'	622'
LP C	-	-	-	-	10,257'	-8,178'	153'	547'	10,168'	-8,135'	189'	601'
LP D	10,393'	-8,315'	132'	398'	10,410'	-8,331'	130'	394'	10,357'	-8,324'	141'	412'
LP E	10,525'	-8,447'	79'	266'	10,540'	-8,461'	77'	264'	10,498'	-8,465'	84'	271'
LP F	10,604'	-8,526'	85'	187'	10,617'	-8,538'	80'	187'	10,582'	-8,549'	78'	187'
False Bakken	10,689'	-8,611'	2'	102'	10,697'	-8,618'	4'	107'	10,660'	-8,627'	2'	109'
Scallion	10,691'	-8,613'	4'	100'	10,701'	-8,622'	6'	103'	10,662'	-8,629'	9'	107'
Upper Bakken Shale	10,695'	-8,617'	14'	96'	10,707'	-8,628'	15'	97'	10,671'	-8,638'	16'	98'
Middle Bakken	10,709'	-8,631'	42'	82'	10,722'	-8,643'	42'	82'	10,687'	-8,654'	42'	82'
Lower Bakken Shale	10,751'	-8,673'	11'	40'	10,764'	-8,685'	11'	40'	10,729'	-8,696'	11'	40'
Pronghorn	10,762'	-8,684'	14'	29'	10,775'	-8,696'	14'	29'	10,740'	-8,707'	14'	29'
Three Forks	10,776'	-8,698'	10'	15'	10,789'	-8,710'	10'	15'	10,754'	-8,721'	10'	15'
Target Top	10,786'	-8,708'	5'	5'	10,799'	-8,720'	5'	5'	10,764'	-8,731'	5'	5'
Target Landing	10,791'	-8,713'	5'	0'	10,804'	-8,725'	5'	0'	10,769'	-8,736'	5'	0'
Target Bottom	10,796'	-8,718'	0'		10,809'	-8,730'	0'		10,774'	-8,741'	0'	
Claystone	10,796'	-8,718'	-		10,809'	-8,730'	-		10,774'	-8,741'	-	

INTERVAL THICKNESS

Oasis Petroleum North America, LLC - Kline Federal 5300 31-18 7T

LANDING PROJECTION

Formation/ Zone:	Proposed Top of Target From:			
	Ash Federal 5300 11-18T	Kline 5300 11-18H	Kline Federal 5300 31-18 15T	Average of Offset Wells
Kibbey Lime	10,770'	10,758'	10,774'	10,767'
Charles Salt	10,770'	10,755'	10,777'	10,767'
UB	10,774'	10,749'	10,770'	10,764'
Base of Last Salt	10,757'	10,741'	10,770'	10,756'
Ratcliffe	10,754'	10,723'	10,772'	10,750'
Mission Canyon	10,769'	10,756'	10,771'	10,765'
Lodgepole	10,765'	10,746'	10,761'	10,757'
LP A	-	10,750'	10,770'	10,760'
LP Fracture Zone	-	10,737'	10,775'	10,756'
LP C	-	10,717'	10,771'	10,744'
LP D	10,761'	10,757'	10,775'	10,764'
LP E	10,766'	10,764'	10,771'	10,767'
LP F	10,772'	10,772'	10,772'	10,772'
False Bakken	10,766'	10,771'	10,773'	10,770'
Scallion	10,766'	10,769'	10,773'	10,769'
Upper Bakken Shale	10,769'	10,770'	10,771'	10,770'
Middle Bakken	10,771'	10,771'	10,771'	10,771'
Lower Bakken Shale	10,773'	10,773'	10,773'	10,773'
Pronghorn	10,775'	10,775'	10,775'	10,775'
Three Forks	10,775'	10,775'	10,775'	10,775'
Target Top	10,777'	10,777'	10,777'	10,777'
Target Landing	10,777'	10,777'	10,777'	10,777'

Current Landing Target (5' above the claystone): **10,777'**

ISOPACH TO TARGET

Oasis Petroleum North America, LLC - Kline Federal 5300 31-18 7T

LITHOLOGY

Oasis Petroleum North America, LLC
Kline Federal 5300 31-18 7T

Rig crews caught 30' sample intervals, under the supervision of Sunburst geologists, from 8,240', to the TD of the lateral at 20,561'. Formation tops and lithologic markers have been inserted into the sample descriptions below for reference. Sample descriptions begin in the Kibbey Formation just prior to the Kibbey Lime. Samples were examined wet and dry under a binocular microscope. Sample fluorescent cuts are masked by invert mud through intermediate casing. Quantifiers in order of increasing abundance are trace, rare, occasional, common and abundant.

Vertical Log Descriptions: MD / TVD (MSL Datum)

8,240-8,270 SILTSTONE: orange-red brown, friable-firm, sub blocky, calcareous cement moderately cemented, possible intergranular porosity, no visible oil stain; SILTY SANDSTONE: tan-off white, very fine grained, sub rounded, moderately sorted, calcite cement, poorly cemented; rare; ANHYDRITE: off white, light red, soft, amorphous texture

8,270-8,300 SILTSTONE: orange-red brown, friable-firm, sub blocky, calcareous cement moderately cemented, possible intergranular porosity, no visible oil stain; SILTY SANDSTONE: tan-off white, very fine grained, sub rounded, moderately sorted, calcite cement, poorly cemented; ANHYDRITE: off white, light red, soft, amorphous texture

Kibbey Lime 8,326' MD / 8,325' TVD (-6,292')

8,300-8,330 ANHYDRITE: off white, light red, soft, amorphous texture rare SILTSTONE: orange-red brown, friable-firm, sub blocky, calcareous cement moderately cemented, possible intergranular porosity, no visible oil stain; trace LIMESTONE: mudstone-wackestone, light brown, light gray brown, microcrystalline, friable, dense, earthy-chalky, trace vuggy porosity

8,330-8,360 LIMESTONE: mudstone-wackestone, light brown, light gray brown, microcrystalline, friable, dense, earthy-chalky, trace vuggy porosity, trace dead oil stain, ANHYDRITE: off white, light red, soft, amorphous texture trace SILTSTONE: orange-red brown, friable-firm, sub blocky, calcareous cement moderately cemented, possible intergranular porosity, no visible oil stain

8,360-8,390 SILTSTONE: dark orange-light brown, tan, pink, soft, sub blocky, calcite cement, poorly cement; trace SILTY SANDSTONE: tan-off white, very fine grained, sub rounded, moderately sorted, calcite cement, poorly cemented

8,390-8,420 SILTSTONE: dark orange-light brown, tan, pink, soft, sub blocky, calcite cement, poorly cement; trace SILTY SANDSTONE: tan-off white, very fine grained, sub rounded, moderately sorted, calcite cement, poorly cemented

8,420-8,450 SILTSTONE: dark orange-light brown, tan, pink, soft, sub blocky, calcite cement, poorly cement; trace SILTY SANDSTONE: tan-off white, very fine grained, sub rounded, moderately sorted, calcite cement, poorly cemented

Charles Formation [Mississippian Madison Group] 8,471' MD / 8,470' TVD (-6,437')

8,450-8,480 SILTSTONE: dark orange-light brown, tan, pink, soft, sub blocky, calcite cement, poorly cement; trace SILTY SANDSTONE: tan-off white, very fine grained, sub rounded, moderately sorted, calcite cement, poorly cemented; common SALT: clear-translucent, rarely frosted, crystalline, firm, euhedral, crystalline

8,480-8,510 SALT: clear-translucent, rarely frosted, crystalline, firm, euhedral, crystalline; trace ARGILLACEOUS LIMESTONE: mudstone-wackestone, light-medium brown, tan, rare light-medium gray, rare gray tan, micro crystalline, friable, earthy

8,510-8,540 SALT: clear-translucent, rarely frosted, crystalline, firm, euhedral, crystalline

8,540-8,570 SALT: clear-translucent, rarely frosted, crystalline, firm, euhedral, crystalline

8,570-8,600 SALT: clear-translucent, rarely frosted, crystalline, firm, euhedral, crystalline

8,600-8,630 SALT: clear-translucent, rarely frosted, crystalline, firm, euhedral, crystalline

8,630-8,660 SALT: clear-translucent, rarely frosted, crystalline, firm, euhedral, crystalline

8,660-8,690 LIMESTONE: mudstone-wackestone, light-medium gray brown, tan, rare light-medium gray, micro crystalline, firm, earthy, argillaceous in part, no visible porosity, no visible porosity; rare SALT: as above; trace DOLOMITE: mudstone, tan, light gray, micro crystalline, firm, earthy, argillaceous in part, no visible porosity, no visible oil stain

8,690-8,720 SALT: clear-translucent, rarely frosted, crystalline, firm, euhedral, crystalline, massive; rare LIMESTONE: mudstone-wackestone, light-medium gray , tan, rare light-medium gray brown, micro crystalline, firm, earthy, argillaceous in part, no visible porosity, no visible porosity; trace DOLOMITE: as above

8,720-8,750 SALT: clear-translucent, rarely frosted, crystalline, firm, euhedral, crystalline, massive; rare LIMESTONE: mudstone-wackestone, light-medium gray , tan, rare light-medium gray brown, micro crystalline, firm, earthy, argillaceous in part, no visible porosity, no visible porosity; trace DOLOMITE: as above

8,750-8,780 SALT: translucent-transparent, clear, micro crystalline, hard, euhedral, crystalline; occasional LIMESTONE: mudstone, tan, off white-cream, light gray, light brown, fine crystalline, firm, dense, earthy-crystalline texture, rare white-clear calcite, no visible porosity, no visible oil stain; rare ANHYDRITE: off white-cream, tan, white, microcrystalline, soft, massive, earthy

8,780-8,810 LIMESTONE: mudstone, tan, off white-cream, light gray, light brown, fine crystalline, firm, dense, earthy-crystalline texture, rare white-clear calcite, no visible porosity, no visible oil stain; ANHYDRITE: off white-cream, tan, white, microcrystalline, soft, massive, earthy; rare SALT: translucent-transparent, clear, micro crystalline, hard, euhedral, crystalline; rare DOLOMITE: light brown-tan, very fine crystalline, firm, dense, crystalline, no visible porosity, no visible oil stain

8,810-8,840 SALT: translucent-transparent, clear, microcrystalline, hard, euhedral, crystalline

8,840-8,870 LIMESTONE: mudstone, light brown, light gray brown, off white-cream, microcrystalline, firm, laminated, earthy, possible intercrystalline porosity, no oil stain; occasional SALT: translucent-transparent, clear, microcrystalline, hard, euhedral, crystalline

8,870-8,900 LIMESTONE: mudstone, light brown, light gray brown, off white-cream, microcrystalline, firm, laminated, earthy, possible intercrystalline porosity, no oil stain; common DOLOMITE: mudstone, light brown, light gray brown, microcrystalline, friable-firm, laminated, earthy, possible intercrystalline porosity, no visible oil stain

8,900-8,930 ANHYDRITE: off white-cream, tan-pink, white, microcrystalline, soft, massive, earthy; LIMESTONE: mudstone, light brown, light gray brown, off white-cream, microcrystalline, firm, laminated, earthy, possible intercrystalline porosity, no oil stain; DOLOMITE: mudstone, light brown, light gray brown, microcrystalline, friable-firm, laminated, earthy, calcareous in part, possible intercrystalline porosity, no visible oil stain

8,930-8,960 SALT: translucent-transparent, clear, microcrystalline, hard, euhedral, crystalline; common CALCAREOUS DOLOMITE: light gray, off white, light brown gray, very fine crystalline, firm, dense, earthy, no visible porosity, no visible oil stain; ANHYDRITE: off white, micro crystalline, soft, massive, earthy

8,960-8,990 SALT: translucent-transparent, clear, microcrystalline, hard, euhedral, crystalline; common DOLOMITE: light gray, off white, light brown gray, very fine crystalline, firm, dense, earthy, no visible porosity, no visible oil stain; ANHYDRITE: off white, micro crystalline, soft, massive, earthy

8,990-9,020 ANHYDRITE: cream-off white, microcrystalline, soft-firm, massive, earthy; LIMESTONE: mudstone, tan, light brown, cream, very fine crystalline, firm-soft, dense, earthy-crystalline texture, argillaceous in part, no visible porosity, no visible oil stain

9,020-9,050 LIMESTONE: mudstone, tan, light brown, cream, very fine crystalline, firm-soft, dense, earthy-crystalline texture, no visible porosity, no visible oil stain; DOLOMITE: mudstone, light brown, light gray brown, microcrystalline, friable-firm, laminated, earthy, possible intercrystalline porosity, no visible oil stain

9,050-9,080 ANHYDRITE: cream-off white, microcrystalline, soft-firm, massive, earthy; LIMESTONE-ARGILLACEOUS LIMESTONE: mudstone, tan, light brown, cream, very fine crystalline, firm-soft, dense, earthy-crystalline texture, argillaceous in part, no visible porosity, no visible oil stain

9,080-9,110 ANHYDRITE: cream-off white, microcrystalline, soft-firm, massive, earthy; LIMESTONE-ARGILLACEOUS LIMESTONE: mudstone, off white-cream, tan-light brown, very fine crystalline, firm-soft, dense, earthy-crystalline texture, argillaceous in part, no visible porosity, no visible oil stain; DOLOMITE: mudstone, light brown, tan, rare light gray brown, microcrystalline, friable-firm, laminated, earthy, calcareous in part, possible intercrystalline porosity, no visible oil stain

9,110-9,140 SALT: translucent-transparent, clear, micro crystalline, hard, euhedral, crystalline

Base Last Salt [Charles Formation] 9,154' MD / 9,153' TVD (-7,120')

9,140-9,170 SALT: as above; common DOLOMITIC LIMESTONE-DOLOMITE: mudstone, light brown, tan, microcrystalline, firm-friable, dense, crystalline-earthy texture, possible intercrystalline porosity, trace light brown spotty

Ratclife [Charles Formation] 9,184' MD / 9,183' TVD (-7,150')

9,170-9,200 DOLOMITIC LIMESTONE-DOLOMITE: mudstone, light brown, tan, microcrystalline, firm-friable, dense, crystalline-earthy texture, possible intercrystalline porosity, trace light brown spotty; rare ANHYDRITE: cream-tan, off white, microcrystalline, soft, massive, earthy

9,200-9,230 LIMESTONE: mudstone, light brown-brown, microcrystalline, firm, earthy-crystalline texture, trace intercrystalline porosity, trace spotty light brown oil stain; rare ANHYDRITE: off white, cream, soft, microcrystalline, massive, earthy-amorphous

9,230-9,260 LIMESTONE: mudstone, light gray, light gray brown, rare light brown, firm, earthy-crystalline texture, possible intercrystalline porosity, trace disseminated pyrite, no visible oil stain; trace ANHYDRITE: off white, cream, soft, microcrystalline, massive, earthy-amorphous

9,260-9,290 LIMESTONE: mudstone, light gray, light gray brown, rare light brown, firm, earthy-crystalline texture, possible intercrystalline porosity, trace disseminated pyrite, no visible oil stain; trace ANHYDRITE: off white, cream, soft, microcrystalline, massive, earthy-amorphous

9,290-9,320 LIMESTONE: mudstone, tan, light gray, light gray brown, rare light brown, firm, earthy-crystalline texture, possible intercrystalline porosity, trace disseminated pyrite, no visible oil stain; trace ANHYDRITE: off white, cream, soft, microcrystalline, massive, earthy-amorphous

9,320-9,350 ARGILLACEOUS LIMESTONE: mudstone, tan, light gray, light gray brown, rare light brown, firm, earthy-crystalline texture, possible intercrystalline porosity, trace disseminated pyrite, no visible oil stain; trace ANHYDRITE: off white, cream, soft, microcrystalline, massive, earthy-amorphous

9,350-9,380 ARGILLACEOUS LIMESTONE: mudstone, light gray-gray, light gray brown, firm, earthy-crystalline texture, possible intercrystalline porosity, trace disseminated pyrite, trace light brown oil stain

Mission Canyon Formation [Mississippian Madison Group] 9,393' MD / 9,392' TVD (-7,359')

9,380-9,410 LIMESTONE: mudstone, light gray-gray, light gray brown, firm, earthy-crystalline texture, possible intercrystalline porosity, trace disseminated pyrite, trace fossil fragments, trace spotty light brown oil stain

9,410-9,440 LIMESTONE: mudstone, light gray-gray, light gray brown, firm, earthy-crystalline texture, trace fossil fragments, possible intercrystalline porosity, trace disseminated pyrite, trace spotty light brown oil stain

9,440-9,470 ARGILLACEOUS LIMESTONE: mudstone, light gray-gray, light gray brown, firm, earthy-crystalline texture, possible intercrystalline porosity, trace fossil fragments, trace disseminated pyrite, trace spotty light brown oil stain

9,470-9,500 ARGILLACEOUS LIMESTONE: mudstone, light gray-gray, light gray brown, rare tan, firm-friable, earthy-crystalline texture, trace fossil fragments, possible intercrystalline porosity, trace spotty disseminated pyrite, trace light brown oil stain

9,500-9,530 ARGILLACEOUS LIMESTONE: mudstone, light gray, light gray brown, rare light brown, firm-friable, earthy-crystalline texture, trace fossil fragments, possible intercrystalline porosity, trace disseminated pyrite, trace spotty light brown oil stain

9,530-9,560 ARGILLACEOUS LIMESTONE: mudstone, light gray, light gray brown, rare light brown, firm-friable, earthy-crystalline texture, trace fossil fragments, trace Algal material, possible intercrystalline porosity, trace disseminated pyrite, trace spotty light brown oil stain

9,560-9,590 ARGILLACEOUS LIMESTONE: mudstone, light gray, light gray brown, rare light brown, firm-friable, earthy-crystalline texture, trace fossil fragments, trace Algal material, possible intercrystalline porosity, trace disseminated pyrite, trace spotty light brown oil stain

9,590-9,620 ARGILLACEOUS LIMESTONE: mudstone, light brown, light gray brown, rare light gray, firm-friable, earthy-crystalline texture, trace fossil fragments, trace Algal material, trace vuggy porosity, possible intercrystalline porosity, trace spotty disseminated pyrite, trace light brown oil stain

9,620-9,650 ARGILLACEOUS LIMESTONE: mudstone, light brown, light gray brown, rare light gray, firm-friable, earthy-crystalline texture, trace fossil fragments, trace Algal material, trace vuggy porosity, possible intercrystalline porosity, trace spotty disseminated pyrite, trace light brown oil stain

9,650-9,680 LIMESTONE: mudstone, light brown, light gray brown, rare light gray, firm-friable, earthy-crystalline texture, possible intercrystalline porosity, trace disseminated pyrite, occasional spotty light brown oil stain

9,680-9,710 LIMESTONE: mudstone, light brown, light gray brown, rare light gray, firm-friable, earthy-crystalline texture, possible intercrystalline porosity, trace disseminated pyrite, occasional spotty light brown oil stain

9,710-9,740 LIMESTONE: mudstone, light brown-rarely brown, light gray brown, rare light gray, firm-friable, earthy-crystalline texture, trace Algal material, trace fossil fragments, possible intercrystalline porosity, trace disseminated pyrite, occasional spotty light brown oil stain

9,740-9,770 LIMESTONE: mudstone, light brown-rarely brown, light gray brown, rare light gray, firm-friable, earthy-crystalline texture, trace Algal material, trace fossil fragments, possible intercrystalline porosity, trace disseminated pyrite, occasional spotty light brown oil stain

9,770-9,800 LIMESTONE: mudstone, light brown-rarely brown, light gray brown, rare light gray, firm-friable, earthy-crystalline texture, trace Algal material, trace fossil fragments, possible intercrystalline porosity, trace disseminated pyrite, occasional spotty light brown oil stain

9,800-9,830 LIMESTONE: mudstone, brown-light brown, light gray brown, rare light gray, firm-friable, earthy-crystalline texture, common Algal material, trace fossil fragments, possible intercrystalline porosity, trace disseminated pyrite, trace spotty light brown oil stain

9,830-9,860 LIMESTONE: mudstone, brown-light brown, light gray brown, rare light gray, firm-friable, earthy-crystalline texture, common Algal material, trace fossil fragments, possible intercrystalline porosity, trace disseminated pyrite, trace spotty light brown oil stain

9,860-9,890 LIMESTONE: mudstone, light gray-gray, rare light gray brown, trace dark brown, firm-friable, earthy-crystalline texture, trace fossil fragments, trace disseminated pyrite, trace spotty light brown oil stain

9,890-9,920 LIMESTONE: mudstone, light gray-gray, rare light gray brown, trace dark gray, firm-friable, earthy-crystalline texture, trace fossil fragments, trace disseminated pyrite, trace spotty light brown oil stain

Lodgepole [Mississippian Madison Group] 9,939' MD / 9,938' TVD (-7,905')

9,920-9,950 LIMESTONE: mudstone, light gray-gray, rare light gray brown, trace dark gray, firm-friable, earthy-crystalline texture, trace fossil fragments, trace disseminated pyrite, no visible oil stain

9,950-9,980 ARGILLACEOUS LIMESTONE: mudstone, off white, light gray, light gray tan, microcrystalline, firm, dense earthy-crystalline texture, trace disseminated pyrite, no visible porosity no visible oil stain; common LIMESTONE: mudstone, light gray-gray, rare gray brown, trace dark gray, firm-friable, earthy-crystalline texture, trace disseminated pyrite, no visible porosity, no visible oil stain

9,980-10,010 ARGILLACEOUS LIMESTONE: mudstone, off white, light gray, light gray tan, microcrystalline, firm, dense earthy-crystalline texture, trace disseminated pyrite, no visible porosity no visible oil stain

10,010-10,040 ARGILLACEOUS LIMESTONE: mudstone, off white, light gray, light gray tan, microcrystalline, firm, dense earthy-crystalline texture, trace disseminated pyrite, no visible porosity no visible oil stain

10,040-10,070 ARGILLACEOUS LIMESTONE: mudstone, light gray, light gray tan, trace cream-off white, microcrystalline, firm, dense, earthy texture, trace disseminated pyrite, no visible porosity, no visible oil stain

10,070-10,100 ARGILLACEOUS LIMESTONE: mudstone, light-medium gray, tan gray, trace light brown, micro crystalline, firm, dense, earthy-trace crystalline texture, no visible porosity, no visible oil stain

10,100-10,130 ARGILLACEOUS LIMESTONE: mudstone, light gray, light gray tan, trace cream-off white, microcrystalline, firm, dense, earthy texture, trace disseminated pyrite, no visible porosity, no visible oil stain

10,130-10,160 ARGILLACEOUS LIMESTONE: mudstone, light gray-medium gray, light gray tan, trace cream-off white, microcrystalline, firm, dense, earthy texture, trace disseminated pyrite, no visible porosity, no visible oil stain

101,060-10,190 ARGILLACEOUS LIMESTONE: mudstone, light gray-medium gray, light gray tan, trace cream-off white, microcrystalline, firm, dense, earthy texture, trace disseminated pyrite, no visible porosity, no visible oil stain

10,190-10,220 ARGILLACEOUS LIMESTONE: mudstone, light gray-gray, rare gray brown, trace dark gray, firm-friable, earthy-crystalline texture, trace disseminated pyrite, no visible porosity, no visible oil stain

10,220-10,250 ARGILLACEOUS LIMESTONE: mudstone, light gray-gray, occasional gray brown, firm, crystalline-earthy texture, trace disseminated pyrite, no visible porosity, no visible oil stain

10,250-10,280 ARGILLACEOUS LIMESTONE: mudstone, light gray-gray, occasional gray brown, firm, crystalline-earthy texture, trace disseminated pyrite, no visible porosity, no visible oil stain

10,280-10,310 ARGILLACEOUS LIMESTONE: mudstone, light gray-gray, occasional gray brown, firm, crystalline-earthy texture, trace disseminated pyrite, no visible porosity, no visible oil stain

10,310-10,340 ARGILLACEOUS LIMESTONE: mudstone, light gray-gray, light gray brown, trace dark gray, firm, crystalline-earthy texture, trace disseminated pyrite, no visible porosity, no visible oil stain

10,340-10,370 ARGILLACEOUS LIMESTONE: mudstone, light gray-gray, light gray brown, trace dark gray, firm, crystalline-earthy texture, trace disseminated pyrite, no visible porosity, no visible oil stain

10,370-10,400 ARGILLACEOUS LIMESTONE: mudstone, light gray-gray, light gray brown, trace dark gray, firm, crystalline-earthy texture, trace disseminated pyrite, no visible porosity, no visible oil stain

10,400-10,430 ARGILLACEOUS LIMESTONE: mudstone, medium gray-light gray, rare light gray brown, trace dark gray AND off white, firm, crystalline-earthy texture, trace disseminated pyrite, no visible porosity, no visible oil stain

10,430-10,460 ARGILLACEOUS LIMESTONE: mudstone, light-medium gray, rare light gray brown, trace dark gray AND off white, firm, crystalline-earthy texture, trace disseminated pyrite, no visible porosity, no visible oil stain

10,460-10,490 ARGILLACEOUS LIMESTONE: mudstone, medium gray-light gray, rare light gray brown, trace dark gray AND off white, firm, crystalline-earthy texture, trace disseminated pyrite, no visible porosity, no visible oil stain

10,490-10,520 ARGILLACEOUS LIMESTONE: mudstone, light-medium gray, rare light gray brown, trace dark gray, firm, crystalline-earthy texture, trace disseminated pyrite, no visible porosity, no visible oil stain

10,520-10,550 ARGILLACEOUS LIMESTONE: mudstone, light gray brown, light gray, tan, firm, crystalline-earthy texture, trace disseminated pyrite, no visible porosity, no visible oil stain

10,550-10,580 ARGILLACEOUS LIMESTONE: mudstone, light brown gray, tan, rare light gray, trace medium gray, firm, crystalline-earthy texture, trace disseminated pyrite, no visible porosity, no visible oil stain

10,580-10,610 ARGILLACEOUS LIMESTONE: mudstone, light brown gray, tan, rare light gray, trace medium gray, firm, crystalline-earthy texture, trace disseminated pyrite, no visible porosity, no visible oil stain

10,610-10,640 ARGILLACEOUS LIMESTONE: mudstone, light gray, medium gray, rare light brown gray, trace medium gray, firm, crystalline-earthy texture, trace disseminated pyrite, no visible porosity, no visible oil stain

10,640-10,670 ARGILLACEOUS LIMESTONE: mudstone, light gray, medium gray, rare light brown gray, trace medium gray, firm, crystalline-earthy texture, trace disseminated pyrite, no visible porosity, no visible oil stain

10,670-10,700 ARGILLACEOUS LIMESTONE: mudstone, light gray, medium gray, rare light brown gray, trace medium gray, firm, crystalline-earthy texture, trace disseminated pyrite, no visible porosity, no visible oil stain

False Bakken Member [Lodgepole Formation] 10,712' MD / 10,664' TVD (-8,631')

Scallion [Lodgepole Formation] 10,716' MD / 10,666' TVD (-8,633')

Upper Bakken Shale [Bakken Formation] 10,727' MD / 10,673' TVD (-8,640')

10,700-10,730 SHALE: black, black gray, hard, splintery, smooth, pyritic, carbonaceous, fracture porosity; occasional ARGILLACEOUS LIMESTONE: mudstone, light gray, medium gray, rare light brown gray, trace medium gray, firm, crystalline-earthy texture, trace disseminated pyrite, no visible porosity, no visible oil stain

Middle Bakken Member [Bakken Formation] 10,756' MD / 10,689' TVD (-8,656)

10,730-10,760 SHALE: black, black gray, hard, splintery, smooth, pyritic, carbonaceous, fracture porosity; common SILTY SANDSTONE: light gray brown, light brown, trace light gray, very fine grained, friable sub rounded, smooth, moderately sorted, calcite cement moderately cemented, trace disseminated and nodular pyrite, fair intercrystalline porosity, occasional light brown spotty oil stain

10,760-10,790 SILTY SANDSTONE: light gray brown, light brown, trace light gray, very fine grained, friable sub rounded, smooth, moderately sorted, calcite cement moderately cemented, trace disseminated and nodular pyrite, fair intercrystalline porosity, occasional light brown spotty oil stain

10,790-10,820 SILTY SANDSTONE: light gray brown, light brown, trace light gray, very fine grained, friable sub rounded, smooth, moderately sorted, calcite cement moderately cemented, trace disseminated and nodular pyrite, fair intercrystalline porosity, occasional light brown spotty oil stain

Lower Bakken Shale [Bakken Formation] 10,836' MD / 10,733' TVD (-8,700')

10,820-10,850 SHALE: black, black gray, hard, splintery, smooth, pyritic, carbonaceous, fracture porosity

Pronghorn [Bakken Formation] 10,865' MD / 10,746' TVD (-8,713')

10,850-10,880 SHALE: black, black gray, hard, splintery, smooth, pyritic, carbonaceous, fracture porosity; SILTSTONE: dark gray, trace gray black, friable-firm, sub blocky-sub splintery, moderately dolomite cemented, trace disseminated and nodular pyrite, trace spotty light brown oil stain

Three Forks [Devonian] 10,903' MD / 10,760' TVD (-8,727')

10,880-10,910 DOLOMITE: mudstone, light brown-light brown gray, tan-cream, trace pink, firm, laminated, micro sucrosic, rare disseminated pyrite, occasional intercrystalline porosity, trace light brown spotty oil stain; rare SHALE: light green-light gray green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

10,910-10,940 DOLOMITE: mudstone, light brown-light brown gray, tan-cream, trace pink, firm, laminated, micro sucrosic, rare disseminated pyrite, occasional intercrystalline porosity, trace light brown spotty oil stain; rare SHALE: light green-light gray green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

10,940-10,970 DOLOMITE: mudstone, light brown-light brown gray, tan-cream, trace pink, firm, laminated, micro sucrosic, rare disseminated pyrite, occasional intercrystalline porosity, trace light brown spotty oil stain; rare SHALE: light green-light gray green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

10,970-11,000 DOLOMITE: mudstone, light brown-light brown gray, tan-cream, trace pink, firm, laminated, micro sucrosic, rare disseminated pyrite, occasional intercrystalline porosity, trace light brown spotty oil stain; rare SHALE: light green-light gray green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

11,000-11,030 DOLOMITE: mudstone, light brown-light brown gray, tan-cream, trace pink, firm, laminated, micro sucrosic, rare disseminated pyrite, occasional intercrystalline porosity, trace light brown spotty oil stain; rare SHALE: light green-light gray green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

11,030-11,060 DOLOMITE: mudstone, light brown-light brown gray, tan-cream, trace pink, firm, laminated, micro sucrosic, rare disseminated pyrite, occasional intercrystalline porosity, trace light brown spotty oil stain; rare SHALE: light green-light gray green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

11,060-11,090 DOLOMITE: mudstone, light brown-light brown gray, tan-cream, trace pink, firm, laminated, micro sucrosic, rare disseminated pyrite, occasional intercrystalline porosity, trace light brown spotty oil stain; rare SHALE: light green-light gray green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

11,090-11,120 DOLOMITE: mudstone, light brown-light brown gray, tan-cream, trace pink, firm, laminated, micro sucrosic, rare disseminated pyrite, occasional intercrystalline porosity, trace light brown spotty oil stain; rare SHALE: light green-light gray green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

11,120-11,150 DOLOMITE: mudstone, light brown-light brown gray, tan-cream, trace pink, firm, laminated, micro sucrosic, rare disseminated pyrite, occasional intercrystalline porosity, trace light brown spotty oil stain; rare SHALE: light green-light gray green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

11,150-11,180 DOLOMITE: mudstone, light brown-light brown gray, tan-cream, trace pink, firm, laminated, micro sucrosic, rare disseminated pyrite, occasional intercrystalline porosity, trace light brown spotty oil stain; rare SHALE: light green-light gray green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

11,180-11,210 DOLOMITE: mudstone, light brown-light brown gray, tan-cream, trace pink, firm, laminated, micro sucrosic, rare disseminated pyrite, occasional intercrystalline porosity, trace light brown spotty oil stain; rare SHALE: light green-light gray green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

11,210-11,240 DOLOMITE: mudstone, light brown-light brown gray, tan-cream, trace pink, firm, laminated, micro sucrosic, rare disseminated pyrite, occasional intercrystalline porosity, trace light brown spotty oil stain; rare SHALE: light green-light gray green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

11,240-11,270 DOLOMITE: mudstone, light brown-light brown gray, tan-cream, trace pink, firm, laminated, micro sucrosic, rare disseminated pyrite, occasional intercrystalline porosity, trace light brown spotty oil stain; rare SHALE: light green-light gray green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

11,270-11,300 DOLOMITE: mudstone, light-medium brown, common light brown gray, trace pink, firm, laminated, micro sucrosic, rare disseminated pyrite, occasional intercrystalline porosity, trace light brown spotty oil stain; rare SHALE: light green-light gray green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

11,300-11,330 DOLOMITE: mudstone, light-medium brown, common light brown gray, trace pink, firm, laminated, micro sucrosic, rare disseminated pyrite, occasional intercrystalline porosity, trace light brown spotty oil stain; rare SHALE: light green-light gray green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

11,330-11,360 DOLOMITE: mudstone, light-medium brown, common light brown gray, trace pink, firm, laminated, micro sucrosic, rare disseminated pyrite, occasional intercrystalline porosity, trace light brown spotty oil stain; rare SHALE: light green-light gray green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

11,360-11,390 DOLOMITE: mudstone, light-medium brown, common light brown gray, trace pink, firm, laminated, micro sucrosic, rare disseminated pyrite, occasional intercrystalline porosity, trace light brown spotty oil stain; rare SHALE: light green-light gray green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

11,390-11,420 DOLOMITE: mudstone, light-medium brown, common light brown gray, trace pink, firm, laminated, micro sucrosic, rare disseminated pyrite, occasional intercrystalline porosity, trace light brown spotty oil stain; rare SHALE: light green-light gray green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

11,420-11,450 DOLOMITE: mudstone, light-medium brown, common light brown gray, trace pink, firm, laminated, micro sucrosic, rare disseminated pyrite, occasional intercrystalline porosity, trace light brown spotty oil stain; rare SHALE: light green-light gray green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

11,450-11,480 DOLOMITE: mudstone, light-medium brown, common light brown gray, trace pink, firm, laminated, micro sucrosic, rare disseminated pyrite, occasional intercrystalline porosity, trace light brown spotty oil stain; rare SHALE: light green-light gray green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

11,480-11,510 DOLOMITE: mudstone, light-medium brown, common light brown gray, trace pink, firm, laminated, micro sucrosic, rare disseminated pyrite, occasional intercrystalline porosity, trace light brown spotty oil stain; rare SHALE: light green-light gray green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

11,510-11,540 DOLOMITE: mudstone, light-medium brown, common light brown gray, trace pink, firm, laminated, micro sucrosic, rare disseminated pyrite, occasional intercrystalline porosity, trace light brown spotty oil stain; rare SHALE: light green-light gray green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

11,540-11,570 DOLOMITE: mudstone, light-medium brown, common light brown gray, trace pink, firm, laminated, micro sucrosic, rare disseminated pyrite, occasional intercrystalline porosity, trace light brown spotty oil stain; rare SHALE: light green-light gray green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

11,570-11,600 DOLOMITE: mudstone, light-medium brown, common light brown gray, trace pink, firm, laminated, micro sucrosic, rare disseminated pyrite, occasional intercrystalline porosity, trace light brown spotty oil stain; rare SHALE: light green-light gray green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

11,600-11,630 DOLOMITE: mudstone, light brown-tan, occasional cream-peach, rare off white, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, occasional intercrystalline porosity, rare spotty trace light brown oil stain; trace SHALE: light gray blue, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

11,630-11,660 DOLOMITE: mudstone, light brown-tan, occasional cream-peach, rare off white, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, occasional intercrystalline porosity, rare spotty trace light brown oil stain; trace SHALE: light gray blue, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

11,660-11,690 DOLOMITE: mudstone, light brown-tan, occasional cream-peach, rare off white, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, occasional intercrystalline porosity, rare spotty trace light brown oil stain; trace SHALE: light gray blue, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

11,690-11,720 DOLOMITE: mudstone, light brown-tan, occasional cream-peach, rare off white, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, occasional intercrystalline porosity, rare spotty trace light brown oil stain; rare SHALE: light green-light gray green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

11,720-11,750 DOLOMITE: mudstone, light brown-tan, occasional cream-peach, rare off white, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, occasional intercrystalline porosity, rare spotty trace light brown oil stain; rare SHALE: light green-light gray green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

11,750-11,780 DOLOMITE: mudstone, light brown-tan, occasional cream-off white, rare light orange, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, occasional intercrystalline porosity, rare spotty trace light brown oil stain; occasional SHALE: light green-light gray green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

11,780-11,810 DOLOMITE: mudstone, light brown-tan, occasional cream-off white, rare light orange, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, occasional intercrystalline porosity, rare spotty trace light brown oil stain; occasional SHALE: light green-light gray green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

11,810-11,840 DOLOMITE: mudstone, light brown-tan, occasional cream-off white, rare light orange, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, occasional intercrystalline porosity, rare spotty trace light brown oil stain; occasional SHALE: light green-light gray green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

11,840-11,870 DOLOMITE: mudstone, light brown-tan, occasional cream-off white, rare light orange, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, occasional intercrystalline porosity, rare spotty trace light brown oil stain; occasional SHALE: light green-light gray green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

11,870-11,900 DOLOMITE: mudstone, light brown-tan, occasional cream-off white, rare light orange, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, occasional intercrystalline porosity, rare spotty trace light brown oil stain; occasional SHALE: light green-light gray green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

11,900-11,930 DOLOMITE: mudstone, light brown-tan, occasional cream-off white, trace light orange, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, occasional intercrystalline porosity, rare spotty trace light brown oil stain; common SHALE: light green-light gray green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

11,930-11,960 DOLOMITE: mudstone, light brown-tan, occasional cream-off white, trace light orange, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, occasional intercrystalline porosity, rare spotty trace light brown oil stain; common SHALE: light green-light gray green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

11,960-11,990 DOLOMITE: mudstone, light brown-tan, occasional cream-off white, trace light orange, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, occasional intercrystalline porosity, rare spotty trace light brown oil stain; common SHALE: light green-light gray green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

11,990-12,020 DOLOMITE: mudstone, light brown-tan, occasional cream-off white, trace light orange, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, occasional intercrystalline porosity, rare spotty trace light brown oil stain; common SHALE: light green-light gray green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

12,020-12,050 DOLOMITE: mudstone, light brown-tan, occasional cream-off white, trace light orange, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, occasional intercrystalline porosity, rare spotty trace light brown oil stain; common SHALE: light green-light gray green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

12,050-12,080 DOLOMITE: mudstone, light brown-tan, occasional cream-off white, trace light orange, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, occasional intercrystalline porosity, rare spotty trace light brown oil stain; common SHALE: light green-light gray green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

12,080-12,110 DOLOMITE: mudstone, light brown-tan, occasional cream-off white, trace light orange, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, occasional intercrystalline porosity, rare spotty trace light brown oil stain; rare SHALE: light green-light gray green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

12,110-12,140 DOLOMITE: mudstone, light brown-tan, occasional cream-off white, trace light orange, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, occasional intercrystalline porosity, rare spotty trace light brown oil stain; rare SHALE: light green-light gray green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

12,140-12,170 DOLOMITE: mudstone, light brown-tan, occasional cream-off white, trace light orange, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, occasional intercrystalline porosity, rare spotty trace light brown oil stain; rare SHALE: light green-light gray green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

12,170-12,200 DOLOMITE: mudstone, light brown-tan, occasional cream-off white, trace light orange, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, occasional intercrystalline porosity, rare spotty trace light brown oil stain; rare SHALE: light green-light gray green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

12,200-12,230 DOLOMITE: mudstone, light brown-tan, occasional cream-off white, trace light orange, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, occasional intercrystalline porosity, rare spotty trace light brown oil stain; rare SHALE: light green-light gray green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

12,230-12,260 DOLOMITE: mudstone, light brown-tan, occasional cream-off white, trace light orange, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, occasional intercrystalline porosity, rare spotty trace light brown oil stain; rare SHALE: light green-light gray green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

12,260-12,290 DOLOMITE: mudstone, light brown-tan, occasional cream-off white, trace light orange, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, occasional intercrystalline porosity, rare spotty trace light brown oil stain; rare SHALE: light green-light gray green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

12,290-12,320 DOLOMITE: mudstone, light brown-tan, occasional cream, trace light pink orange, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty trace light brown oil stain; occasional SHALE: light green-mint green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

12,320-12,350 DOLOMITE: mudstone, light brown-tan, occasional cream, trace light pink orange, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty trace light brown oil stain; occasional SHALE: light green-mint green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

12,350-12,380 DOLOMITE: mudstone, light brown-tan, occasional cream, trace light pink orange, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty trace light brown oil stain; occasional SHALE: light green-mint green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

12,380-12,410 DOLOMITE: mudstone, light brown-tan, occasional cream, trace light pink orange, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty trace light brown oil stain; occasional SHALE: light green-mint green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

12,410-12,440 DOLOMITE: mudstone, light brown-tan, occasional cream, trace light pink orange, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty trace light brown oil stain; occasional SHALE: light green-mint green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

12,440-12,470 DOLOMITE: mudstone, light brown-tan, occasional cream, trace light pink orange, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty trace light brown oil stain; occasional SHALE: light green-mint green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

12,470-12,500 DOLOMITE: mudstone, light brown-tan, occasional cream, trace light pink orange, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty trace light brown oil stain; occasional SHALE: light green-mint green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

12,500-12,530 SHALE: light green-mint green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain; common DOLOMITE: mudstone, light brown-tan, occasional cream, trace light pink orange, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty trace light brown oil stain

12,530-12,560 SHALE: light green-mint green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain; common DOLOMITE: mudstone, light brown-tan, occasional cream, trace light pink orange, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty trace light brown oil stain

12,560-12,590 SHALE: light green-mint green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain; common DOLOMITE: mudstone, light brown-tan, occasional cream, trace light pink orange, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty trace light brown oil stain

12,590-12,620 SHALE: light green-mint green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain; common DOLOMITE: mudstone, light brown-tan, occasional cream, trace light pink orange, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty trace light brown oil stain

12,650-12,680 DOLOMITE: mudstone, light brown-tan, occasional cream, trace light pink orange, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty trace light brown oil stain; occasional SHALE: light green-mint green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

12,650-12,680 DOLOMITE: mudstone, light brown-tan, occasional cream, trace light pink orange, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty trace light brown oil stain; occasional SHALE: light green-mint green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

12,680-12,710 DOLOMITE: mudstone, light brown-tan, occasional cream, trace light pink orange, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty trace light brown oil stain; occasional SHALE: light green-mint green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

12,710-12,740 DOLOMITE: mudstone, light brown-tan, occasional cream, trace light pink orange, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty trace light brown oil stain; occasional SHALE: light green-mint green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

12,740-12,770 DOLOMITE: mudstone, light brown-tan, occasional cream, trace light pink orange, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty trace light brown oil stain; occasional SHALE: light green-mint green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

12,770-12,800 DOLOMITE: mudstone, light brown-tan, occasional cream, trace light pink orange, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty trace light brown oil stain; occasional SHALE: light green-mint green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

12,800-12,830 SHALE: light green-mint green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain; common DOLOMITE: mudstone, light brown-tan, occasional cream, trace light pink orange, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty trace light brown oil stain

12,830-12,860 SHALE: light green-mint green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain; common DOLOMITE: mudstone, light brown-tan, occasional cream, trace light pink orange, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty trace light brown oil stain

12,860-12,890 DOLOMITE: mudstone, light brown-tan, occasional cream, trace light pink orange, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty trace light brown oil stain; occasional SHALE: light green-mint green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

12,890-12,920 DOLOMITE: mudstone, light brown-tan, occasional cream, trace light pink orange, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty trace light brown oil stain; occasional SHALE: light green-mint green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

12,920-12,950 DOLOMITE: mudstone, light brown-tan, occasional cream, trace light pink orange, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty trace light brown oil stain; occasional SHALE: light green-mint green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

12,950-12,980 DOLOMITE: mudstone, light brown-tan, occasional cream, trace light pink orange, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty trace light brown oil stain; occasional SHALE: light green-mint green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

12,980-13,010 DOLOMITE: mudstone, light brown-tan, occasional cream, trace light pink orange, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty trace light brown oil stain; occasional SHALE: light green-mint green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

13,010-13,040 DOLOMITE: mudstone, light brown-tan, occasional cream, trace light pink orange, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty trace light brown oil stain; occasional SHALE: light green-mint green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

13,040-13,070 DOLOMITE: mudstone, light brown-tan, occasional cream, trace light pink orange, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty trace light brown oil stain; occasional SHALE: light green-mint green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

13,070-13,100 DOLOMITE: mudstone, tan-cream, light brown, trace light pink orange, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty trace light brown oil stain; common SHALE: light green-mint green, trace light gray, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain; moderately yellow diffuse cut fluorescence

13,100-13,130 DOLOMITE: mudstone, tan-cream, light brown, trace light pink orange, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty trace light brown oil stain; common SHALE: light green-mint green, trace light gray, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain; moderately yellow green streaming cut fluorescence

13,130-13,160 DOLOMITE: mudstone, tan-cream, light brown, trace light pink orange, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty trace light brown oil stain; common SHALE: light green-mint green, trace light gray, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain; moderately yellow green streaming cut fluorescence

13,160-13,190 DOLOMITE: mudstone, tan-cream, light brown, trace light pink orange, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty trace light brown oil stain; common SHALE: light green-mint green, trace light gray, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain; moderately yellow green streaming cut fluorescence

13,190-13,220 DOLOMITE: mudstone, tan-cream, light brown, trace light pink orange, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty trace light brown oil stain; common SHALE: light green-mint green, trace light gray, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain; moderately yellow green streaming cut fluorescence

13,220-13,250 DOLOMITE: mudstone, tan-cream, light brown, trace light pink orange, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty trace light brown oil stain; common SHALE: light green-mint green, trace light gray, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain; moderately yellow green streaming cut fluorescence

13,250-13,280 DOLOMITE: mudstone, tan-cream, light brown, trace light pink orange, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty trace light brown oil stain; common SHALE: light green-mint green, trace light gray, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain; moderately yellow green streaming cut fluorescence

13,280-13,310 SHALE: light green-mint green, trace light gray, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain; occasional DOLOMITE: mudstone, tan-cream, light brown, trace light pink orange, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty trace light brown oil stain; moderately yellow green streaming cut fluorescence

13,310-13,340 SHALE: light green-mint green, trace light gray, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain; occasional DOLOMITE: mudstone, tan-cream, light brown, trace light pink orange, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty trace light brown oil stain; moderately yellow green streaming cut fluorescence

13,340-13,370 DOLOMITE: mudstone, light brown-tan, trace light pink orange, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty trace light brown oil stain; common SHALE: light green-mint green, trace light gray, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain; moderately yellow green streaming cut fluorescence

13,370-13,400 DOLOMITE: mudstone, tan-cream, light brown, trace light pink orange, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty trace light brown oil stain; common SHALE: light green-mint green, trace light gray, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain; moderately yellow green streaming cut fluorescence

13,400-13,430 DOLOMITE: mudstone, tan-cream, light brown, trace light pink orange, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty trace light brown oil stain; common SHALE: light green-mint green, trace light gray, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain; moderately yellow green streaming cut fluorescence

13,430-13,460 DOLOMITE: mudstone, tan-cream, light brown, trace light pink orange, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty trace light brown oil stain; common SHALE: light green-mint green, trace light gray, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain; moderately yellow green streaming cut fluorescence

13,460-13,490 DOLOMITE: mudstone, tan-cream, light brown, trace light pink orange, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty trace light brown oil stain; common SHALE: light green-mint green, trace light gray, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain; moderately yellow green streaming cut fluorescence

13,490-13,520 DOLOMITE: mudstone, tan-cream, light brown, trace light pink orange, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty trace light brown oil stain; common SHALE: light green-mint green, trace light gray, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain; moderately yellow green streaming cut fluorescence

13,520-13,550 DOLOMITE: mudstone, tan-cream, light brown, trace light pink orange, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty trace light brown oil stain; common SHALE: light green-mint green, trace light gray, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain; moderately yellow green streaming cut fluorescence

13,550-13,580 DOLOMITE: mudstone, tan-cream, light brown, trace light pink orange, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty trace light brown oil stain; common SHALE: light green-mint green, trace light gray, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain; moderately yellow green streaming cut fluorescence

13,580-13,610 DOLOMITE: mudstone, tan-cream, light brown, trace light pink orange, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty trace light brown oil stain; common SHALE: light green-mint green, trace light gray, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain; moderately yellow green streaming cut fluorescence

13,610-13,640 DOLOMITE: mudstone, tan-cream, light brown, trace light pink orange, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty trace light brown oil stain; common SHALE: light green-mint green, trace light gray, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain; moderately yellow green streaming cut fluorescence

13,640-13,670 DOLOMITE: mudstone, tan-cream, light brown, trace light pink orange, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty trace light brown oil stain; common SHALE: light green-mint green, trace light gray, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain; moderately yellow green streaming cut fluorescence

13,670-13,700 DOLOMITE: mudstone, tan-cream, light brown, trace light pink orange, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty trace light brown oil stain; common SHALE: light green-mint green, trace light gray, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain; moderately yellow green streaming cut fluorescence

13,700-13,730 DOLOMITE: mudstone, tan-cream, light brown, trace light pink orange, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty trace light brown oil stain; common SHALE: light green-mint green, trace light gray, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain; moderately yellow green streaming cut fluorescence

13,730-13,760 DOLOMITE: mudstone, tan-cream, light brown, trace light pink orange, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty trace light brown oil stain; common SHALE: light green-mint green, trace light gray, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain; moderately yellow green streaming cut fluorescence

13,760-13,790 DOLOMITE: mudstone, tan-cream, light brown, trace light pink orange, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty trace light brown oil stain; common SHALE: light green-mint green, trace light gray, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain; moderately yellow green streaming cut fluorescence

13,790-13,820 DOLOMITE: mudstone, tan-cream, light brown, trace light pink orange, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty trace light brown oil stain; common SHALE: light green-mint green, trace light gray, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain; moderately yellow green streaming cut fluorescence

13,820-13,850 SHALE: light green-mint green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain; common DOLOMITE: mudstone, light brown-tan, occasional cream, trace light pink orange, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty trace light brown oil stain

13,850-13,880 SHALE: light green-mint green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain; common DOLOMITE: mudstone, light brown-tan, occasional cream, trace light pink orange, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty trace light brown oil stain

13,880-13,910 SHALE: light green-mint green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain; common DOLOMITE: mudstone, light brown-tan, occasional cream, trace light pink orange, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty trace light brown oil stain

13,910-13,940 SHALE: light green-mint green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain; common DOLOMITE: mudstone, light brown-tan, occasional cream, trace light pink orange, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty trace light brown oil stain

13,940-13,970 DOLOMITE: mudstone, tan-cream, trace light pink orange, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty trace light brown oil stain; common SHALE: light green-mint green, trace light gray, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain; moderately yellow green streaming cut fluorescence

13,970-14,000 DOLOMITE: mudstone, tan-cream, trace light pink orange, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty trace light brown oil stain; common SHALE: light green-mint green, trace light gray, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain; moderately yellow green streaming cut fluorescence

14,000-14,030 DOLOMITE: mudstone, tan-cream, trace light pink orange, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty trace light brown oil stain; common SHALE: light green-mint green, trace light gray, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain; moderately yellow green streaming cut fluorescence

14,030-14,060 DOLOMITE: mudstone, tan, common cream- off white, trace light pink orange, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty trace light brown oil stain; common SHALE: light green-mint green, trace light gray, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain; moderately yellow green streaming cut fluorescence

14,060-14,090 DOLOMITE: mudstone, tan, common cream- off white, trace light pink orange, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty trace light brown oil stain; common SHALE: light green-mint green, trace light gray, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain; moderately yellow green streaming cut fluorescence

14,090-14,120 DOLOMITE: mudstone, tan, common cream- off white, trace light pink orange, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty trace light brown oil stain; common SHALE: light green-mint green, trace light gray, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain; moderately yellow green streaming cut fluorescence

14,120-14,150 DOLOMITE: mudstone, tan, common cream- off white, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty trace light brown oil stain; occasional SHALE: light green-mint green, trace light gray, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain; moderately yellow green streaming cut fluorescence

14,150-14,180 DOLOMITE: mudstone, tan, common cream- off white, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty trace light brown oil stain; occasional SHALE: light green-mint green, trace light gray, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain; moderately yellow green streaming cut fluorescence

14,180-14,210 DOLOMITE: mudstone, tan, common cream- off white, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty trace light brown oil stain; occasional SHALE: light green-mint green, trace light gray, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain; moderately yellow green streaming cut fluorescence

14,210-14,240 DOLOMITE: mudstone, tan, common cream- off white, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty trace light brown oil stain; occasional SHALE: light green-mint green, trace light gray, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain; moderately yellow green streaming cut fluorescence

14,240-14,270 DOLOMITE: mudstone, light brown-tan, trace light pink orange, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty trace light brown oil stain; common SHALE: light green-mint green, trace light gray, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain; moderately yellow green streaming cut fluorescence

14,270-14,300 DOLOMITE: mudstone, light brown-tan, trace light pink orange, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty trace light brown oil stain; common SHALE: light green-mint green, trace light gray, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain; moderately yellow green streaming cut fluorescence

14,300-14,330 DOLOMITE: mudstone, light brown-tan, trace light pink orange, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty trace light brown oil stain; common SHALE: light green-mint green, trace light gray, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain; moderately yellow green streaming cut fluorescence

14,330-14,360 DOLOMITE: mudstone, light brown-tan, trace light pink orange, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty trace light brown oil stain; common SHALE: light green-mint green, trace light gray, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain; moderately yellow green streaming cut fluorescence

14,360-14,390 DOLOMITE: mudstone, light brown-tan, trace light pink orange, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty trace light brown oil stain; common SHALE: light green-mint green, trace light gray, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain; moderately yellow green streaming cut fluorescence

14,390-14,420 DOLOMITE: mudstone, light brown-tan, trace light pink orange, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty trace light brown oil stain; common SHALE: light green-mint green, trace light gray, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain; moderately yellow green streaming cut fluorescence

14,420-14,450 DOLOMITE: mudstone, light tan, occasional cream-off white, trace light pink orange, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty trace light brown oil stain; common SHALE: light green-mint green, trace light gray, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain; moderately yellow green streaming cut fluorescence

14,450-14,480 DOLOMITE: mudstone, light tan, occasional cream-off white, trace light pink orange, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty trace light brown oil stain; common SHALE: light green-mint green, trace light gray, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain; moderately yellow green streaming cut fluorescence

14,480-14,510 DOLOMITE: mudstone, light tan, occasional cream-off white, trace light pink orange, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty trace light brown oil stain; common SHALE: light green-mint green, trace light gray, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain; moderately yellow green streaming cut fluorescence

14,510-14,540 DOLOMITE: mudstone, light tan, occasional cream-off white, trace light pink orange, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty trace light brown oil stain; common SHALE: light green-mint green, trace light gray, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain; moderately yellow green streaming cut fluorescence

14,540-14,570 DOLOMITE: mudstone, light tan, occasional cream-off white, trace light pink orange, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty trace light brown oil stain; common SHALE: light green-mint green, trace light gray, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain; moderately yellow green streaming cut fluorescence

14,570-14,600 DOLOMITE: mudstone, light tan, occasional cream-off white, trace light pink orange, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty trace light brown oil stain; common SHALE: light green-mint green, trace light gray, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain; moderately yellow green streaming cut fluorescence

14,600-14,630 DOLOMITE: mudstone, light tan-cream, occasional peach, trace light brown, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty trace light brown oil stain; common SHALE: light green-mint green, trace light gray, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

14,630-14,660 DOLOMITE: mudstone, light tan-cream, occasional peach, trace light brown, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty trace light brown oil stain; common SHALE: light green-mint green, trace light gray, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

14,660-14,690 DOLOMITE: mudstone, light tan-cream, occasional peach, trace light brown, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty trace light brown oil stain; common SHALE: light green-mint green, trace light gray, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

14,690-14,720 DOLOMITE: mudstone, light tan-cream, occasional peach, trace light brown, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty trace light brown oil stain; common SHALE: light green-mint green, trace light gray, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

14,720-14,750 DOLOMITE: mudstone, light tan-cream, occasional peach, trace light brown, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty trace light brown oil stain; common SHALE: light green-mint green, trace light gray, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

14,750-14,780 DOLOMITE: mudstone, light tan-cream, occasional peach, trace light brown, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty trace light brown oil stain; common SHALE: light green-mint green, trace light gray, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

14,780-14,810 DOLOMITE: mudstone, light tan-cream, occasional peach, trace light brown, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty trace light brown oil stain; common SHALE: light green-mint green, trace light gray, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

14,810-14,840 DOLOMITE: mudstone, light tan-cream, occasional peach, trace light brown, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty trace light brown oil stain; common SHALE: light green-mint green, trace light gray, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

14,840-14,870 DOLOMITE: mudstone, light tan-cream, occasional peach, trace light brown, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty trace light brown oil stain; common SHALE: light green-mint green, trace light gray, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

14,870-14,900 DOLOMITE: mudstone, light tan-cream, occasional peach, trace light brown, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty trace light brown oil stain; common SHALE: light green-mint green, trace light gray, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

14,900-14,930 DOLOMITE: mudstone, light tan-cream, occasional peach, trace light brown, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty trace light brown oil stain; common SHALE: light green-mint green, trace light gray, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

14,930-14,960 DOLOMITE: mudstone, light tan-cream, occasional peach, trace light brown, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty trace light brown oil stain; common SHALE: light green-mint green, trace light gray, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

14,960-14,990 DOLOMITE: mudstone, light tan-cream, occasional peach, trace light brown, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty trace light brown oil stain; common SHALE: light green-mint green, trace light gray, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

14,990-15,020 DOLOMITE: mudstone, light brown-tan, trace light pink orange, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty trace light brown oil stain; common SHALE: light green-mint green, trace light gray, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain; moderately yellow green streaming cut fluorescence

15,020-15,050 DOLOMITE: mudstone, light brown-tan, trace light pink orange, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty trace light brown oil stain; common SHALE: light green-mint green, trace light gray, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain; moderately yellow green streaming cut fluorescence

15,050-15,080 DOLOMITE: mudstone, light brown-tan, trace light pink orange, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty trace light brown oil stain; common SHALE: light green-mint green, trace light gray, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain; moderately yellow green streaming cut fluorescence

15,080-15,110 DOLOMITE: mudstone, light brown-tan, trace light pink orange, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty trace light brown oil stain; common SHALE: light green-mint green, trace light gray, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain; moderately yellow green streaming cut fluorescence

15,110-15,140 DOLOMITE: mudstone, light brown-tan, trace light pink orange, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty trace light brown oil stain; common SHALE: light green-mint green, trace light gray, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain; moderately yellow green streaming cut fluorescence

15,140-15,170 DOLOMITE: mudstone, light brown-tan, trace light pink orange, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty trace light brown oil stain; common SHALE: light green-mint green, trace light gray, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain; moderately yellow green streaming cut fluorescence

15,170-15,200 DOLOMITE: mudstone, light brown-tan, trace light pink orange, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty trace light brown oil stain; common SHALE: light green-mint green, trace light gray, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain; moderately yellow green streaming cut fluorescence

15,200-15,230 DOLOMITE: mudstone, light tan, cream-off white, trace light pink orange, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty trace light brown oil stain; common SHALE: light green-mint green, trace light gray, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

15,230-15,260 DOLOMITE: mudstone, light tan, cream-off white, trace light pink orange, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty trace light brown oil stain; common SHALE: light green-mint green, trace light gray, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

15,260-15,290 DOLOMITE: mudstone, light tan, cream-off white, trace light pink orange, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty trace light brown oil stain; common SHALE: light green-mint green, trace light gray, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

15,290-15,320 DOLOMITE: mudstone, light tan, cream-off white, trace light pink orange, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty trace light brown oil stain; common SHALE: light green-mint green, trace light gray, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

15,320-15,350 DOLOMITE: mudstone, light tan, cream-off white, trace light pink orange, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty trace light brown oil stain; common SHALE: light green-mint green, trace light gray, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

15,350-15,380 DOLOMITE: mudstone, light tan, cream-off white, trace light pink orange, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty trace light brown oil stain; common SHALE: light green-mint green, trace light gray, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

15,380-15,410 DOLOMITE: mudstone, light tan, cream-off white, trace light pink orange, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty trace light brown oil stain; common SHALE: light green-mint green, trace light gray, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

15,410-15,440 SHALE: light green-mint green, trace light gray, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain; common DOLOMITE: mudstone, light tan, cream-off white, trace light pink orange, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty trace light brown oil stain

15,440-15,470 SHALE: light green-mint green, trace light gray, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain; common DOLOMITE: mudstone, light tan, cream-off white, trace light pink orange, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty trace light brown oil stain

15,470-15,500 SHALE: light green-mint green, trace light gray, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain; common DOLOMITE: mudstone, light tan, cream-off white, trace light pink orange, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty trace light brown oil stain

15,500-15,530 SHALE: light green-mint green, light blue green, trace dark gray black, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain; common DOLOMITE: mudstone, cream-off white, trace light brown, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty light brown oil stain

15,530-15,560 SHALE: light green-mint green, light blue green, trace dark gray black, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain; common DOLOMITE: mudstone, cream-off white, trace light brown, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty light brown oil stain

15,560-15,590 SHALE: light green-mint green, light blue green, trace dark gray black, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain; common DOLOMITE: mudstone, cream-off white, trace light brown, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty light brown oil stain

15,590-15,620 SHALE: light green-mint green, light blue green, trace dark gray black, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain; common DOLOMITE: mudstone, cream-off white, trace light brown, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty light brown oil stain

15,620-15,650 SHALE: light green-mint green, light blue green, trace dark gray black, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain; common DOLOMITE: mudstone, cream-off white, trace light brown, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty light brown oil stain

15,650-15,680 SHALE: light green-mint green, light blue green, trace dark gray black, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain; common DOLOMITE: mudstone, cream-off white, trace light brown, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty light brown oil stain

15,680-15,710 SHALE: light green-mint green, light blue green, trace dark gray black, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain; common DOLOMITE: mudstone, cream-off white, trace light brown, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty light brown oil stain

15,710-15,740 SHALE: light green-mint green, light blue green, trace dark gray black, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain; common DOLOMITE: mudstone, cream-off white, trace light brown, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty light brown oil stain

15,740-15,770 SHALE: light green-mint green, light blue green, trace dark gray black, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain; common DOLOMITE: mudstone, cream-off white, trace light brown, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty light brown oil stain

15,770-15,800 DOLOMITE: mudstone, cream-off white, trace light brown, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty light brown oil stain; common SHALE: light green-mint green, light blue green, trace dark gray black, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain; moderately green yellow streaming cut fluorescence

15,800-15,830 DOLOMITE: mudstone, cream-off white, trace light brown, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty light brown oil stain; common SHALE: light green-mint green, light blue green, trace dark gray black, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain; moderately green yellow streaming cut fluorescence

15,830-15,860 DOLOMITE: mudstone, cream-off white, trace light brown, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty light brown oil stain; common SHALE: light green-mint green, light blue green, trace dark gray black, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain; moderately green yellow streaming cut fluorescence

15,860-15,890 DOLOMITE: mudstone, cream-off white, trace light brown, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty light brown oil stain; common SHALE: light green-mint green, light blue green, trace dark gray black, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain; moderately green yellow streaming cut fluorescence

15,890-15,920 DOLOMITE: mudstone, cream-off white, trace light brown, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty light brown oil stain; common SHALE: light green-mint green, light blue green, trace dark gray black, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain; moderately green yellow streaming cut fluorescence

15,920-15,950 DOLOMITE: mudstone, cream-off white, trace light brown, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty light brown oil stain; common SHALE: light green-mint green, light blue green, trace dark gray black, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain; moderately green yellow streaming cut fluorescence

15,950-15,980 DOLOMITE: mudstone, cream-off white, trace light brown, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty light brown oil stain; common SHALE: light green-mint green, light blue green, trace dark gray black, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain; moderately green yellow streaming cut fluorescence

15,980-16,010 DOLOMITE: mudstone, cream-off white, trace light brown, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty light brown oil stain; common SHALE: light green-mint green, light blue green, trace dark gray black, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain; moderately green yellow streaming cut fluorescence

16,010-16,040 DOLOMITE: mudstone, cream-off white, trace light brown, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty light brown oil stain; common SHALE: light green-mint green, light blue green, trace dark gray black, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain; moderately green yellow streaming cut fluorescence

16,040-16,070 DOLOMITE: mudstone, cream-off white, trace light brown, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty light brown oil stain; common SHALE: light green-mint green, light blue green, trace dark gray black, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain; moderately green yellow streaming cut fluorescence

16,070-16,100 DOLOMITE: mudstone, cream-off white, trace light brown, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty light brown oil stain; common SHALE: light green-mint green, light blue green, trace dark gray black, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain; moderately green yellow streaming cut fluorescence

16,100-16,130 DOLOMITE: mudstone, cream-off white, trace light brown, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty light brown oil stain; common SHALE: light green-mint green, light blue green, trace dark gray black, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain; moderately green yellow streaming cut fluorescence

16,130-16,160 DOLOMITE: mudstone, cream-off white, trace light brown, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty light brown oil stain; common SHALE: light green-mint green, light blue green, trace dark gray black, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain; moderately green yellow streaming cut fluorescence

16,160-16,190 DOLOMITE: mudstone, cream-off white, trace light brown, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty light brown oil stain; common SHALE: light green-mint green, light blue green, trace dark gray black, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain; moderately green yellow streaming cut fluorescence

16,190-16,220 DOLOMITE: mudstone, tan-light brown, cream-off white, trace light gray, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, occasional spotty light-medium brown oil stain; common SHALE: light green-mint green, light blue green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain; moderately green yellow streaming cut fluorescence

16,220-16,250 DOLOMITE: mudstone, tan-light brown, cream-off white, trace light gray, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, occasional spotty light-medium brown oil stain; common SHALE: light green-mint green, light blue green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain; moderately green yellow streaming cut fluorescence

16,250-16,280 DOLOMITE: mudstone, tan-light brown, cream-off white, trace light gray, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, occasional spotty light-medium brown oil stain; common SHALE: light green-mint green, light blue green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain; moderately green yellow streaming cut fluorescence

16,280-16,310 DOLOMITE: mudstone, tan-light brown, cream-off white, trace light gray, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, occasional spotty light-medium brown oil stain; common SHALE: light green-mint green, light blue green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain; moderately green yellow streaming cut fluorescence

16,310-16,340 DOLOMITE: mudstone, tan-light brown, cream-off white, trace light gray, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, occasional spotty light-medium brown oil stain; common SHALE: light green-mint green, light blue green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain; moderately green yellow streaming cut fluorescence

16,340-16,370 DOLOMITE: mudstone, tan-light brown, cream-off white, trace light gray, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, occasional spotty light-medium brown oil stain; common SHALE: light green-mint green, light blue green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain; moderately green yellow streaming cut fluorescence

16,370-16,400 DOLOMITE: mudstone, tan-light brown, cream-off white, trace light gray, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, occasional spotty light-medium brown oil stain; common SHALE: light green-mint green, light blue green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain; moderately green yellow streaming cut fluorescence

16,400-16,430 DOLOMITE: mudstone, tan-light brown, cream-off white, trace light gray, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, occasional spotty light-medium brown oil stain; common SHALE: light green-mint green, light blue green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain; moderately green yellow streaming cut fluorescence

16,430-16,460 DOLOMITE: mudstone, tan-light brown, cream-off white, trace light gray, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, occasional spotty light-medium brown oil stain; common SHALE: light green-mint green, light blue green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain; moderately green yellow streaming cut fluorescence

16,460-16,490 DOLOMITE: mudstone, tan-light brown, cream-off white, trace light gray, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, occasional spotty light-medium brown oil stain; common SHALE: light green-mint green, light blue green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain; moderately green yellow streaming cut fluorescence

16,490-16,520 DOLOMITE: mudstone, tan-light brown, cream-off white, trace light gray, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, occasional spotty light-medium brown oil stain; common SHALE: light green-mint green, light blue green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain; moderately green yellow streaming cut fluorescence

16,520-16,550 DOLOMITE: mudstone, tan-light brown, cream-off white, trace light gray, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, occasional spotty light-medium brown oil stain; common SHALE: light green-mint green, light blue green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain; moderately green yellow streaming cut fluorescence

16,550-16,580 DOLOMITE: mudstone, light tan, cream-off white, trace light gray, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, occasional spotty light-medium brown oil stain; occasional SHALE: light green-mint green, light blue green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain; moderately green yellow streaming cut fluorescence

16,580-16,610 DOLOMITE: mudstone, light tan, cream-off white, trace light gray, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, occasional spotty light-medium brown oil stain; occasional SHALE: light green-mint green, light blue green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain; moderately green yellow streaming cut fluorescence

16,610-16,640 DOLOMITE: mudstone, light tan, cream-off white, trace light gray, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, occasional spotty light-medium brown oil stain; occasional SHALE: light green-mint green, light blue green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

16,640-16,670 DOLOMITE: mudstone, light tan, cream-off white, trace light gray, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, occasional spotty light-medium brown oil stain; occasional SHALE: light green-mint green, light blue green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

16,670-16,700 DOLOMITE: mudstone, light tan, cream-off white, trace light gray, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, occasional spotty light-medium brown oil stain; occasional SHALE: light green-mint green, light blue green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

16,700-16,730 DOLOMITE: mudstone, light tan, cream-off white, trace light gray, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, occasional spotty light-medium brown oil stain; occasional SHALE: light green-mint green, light blue green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

16,730-16,760 DOLOMITE: mudstone, light tan, cream-off white, trace light gray, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, occasional spotty light-medium brown oil stain; occasional SHALE: light green-mint green, light blue green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

16,760-16,790 DOLOMITE: mudstone, light brown-tan, cream-off white, trace peach, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, occasional spotty light-medium brown oil stain; occasional SHALE: light green-mint green, light blue green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

16,790-16,820 DOLOMITE: mudstone, light brown-tan, cream-off white, trace peach, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, occasional spotty light-medium brown oil stain; occasional SHALE: light green-mint green, light blue green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

16,820-16,850 DOLOMITE: mudstone, light brown-tan, cream-off white, trace peach, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, occasional spotty light-medium brown oil stain; occasional SHALE: light green-mint green, light blue green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

16,850-16,880 DOLOMITE: mudstone, light brown-tan, cream-off white, trace peach, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, occasional spotty light-medium brown oil stain; occasional SHALE: light green-mint green, light blue green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

16,880-16,910 DOLOMITE: mudstone, light brown-tan, cream-off white, trace peach, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, occasional spotty light-medium brown oil stain; occasional SHALE: light green-mint green, light blue green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

16,910-16,940 DOLOMITE: mudstone, light brown-tan, cream-off white, trace peach, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, occasional spotty light-medium brown oil stain; occasional SHALE: light green-mint green, light blue green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

16,940-16,970 DOLOMITE: mudstone, light brown-tan, rare cream-off white, trace peach, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, occasional spotty light-medium brown oil stain; rare SHALE: light green-mint green, light blue green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

16,970-17,000 DOLOMITE: mudstone, light brown-tan, rare cream-off white, trace peach, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, occasional spotty light-medium brown oil stain; rare SHALE: light green-mint green, light blue green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

17,000-17,030 DOLOMITE: mudstone, light brown-tan, rare cream-off white, trace peach, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, occasional spotty light-medium brown oil stain; rare SHALE: light green-mint green, light blue green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

17,030-17,060 DOLOMITE: mudstone, light brown-tan, rare cream-off white, trace peach, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, occasional spotty light-medium brown oil stain; rare SHALE: light green-mint green, light blue green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

17,060-17,090 DOLOMITE: mudstone, light brown-tan, rare cream-off white, trace peach, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, occasional spotty light-medium brown oil stain; rare SHALE: light green-mint green, light blue green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

17,090-17,120 DOLOMITE: mudstone, light brown-tan, rare cream-off white, trace peach, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, occasional spotty light-medium brown oil stain; rare SHALE: light green-mint green, light blue green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

17,120-17,150 DOLOMITE: mudstone, light brown-tan, rare cream-off white, trace peach, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, occasional spotty light-medium brown oil stain; rare SHALE: light green-mint green, light blue green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

17,150-17,180 DOLOMITE: mudstone, light tan, occasional cream-off white, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, occasional spotty light-medium brown oil stain; common SHALE: light green-mint green, light blue green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

17,180-17,210 DOLOMITE: mudstone, light tan, occasional cream-off white, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, occasional spotty light-medium brown oil stain; common SHALE: light green-mint green, light blue green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

17,210-17,240 DOLOMITE: mudstone, light tan, occasional cream-off white, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, occasional spotty light-medium brown oil stain; common SHALE: light green-mint green, light blue green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

17,240-17,270 DOLOMITE: mudstone, light tan, occasional cream-off white, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, occasional spotty light-medium brown oil stain; common SHALE: light green-mint green, light blue green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

17,270-17,300 DOLOMITE: mudstone, light tan, occasional cream-off white, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, occasional spotty light-medium brown oil stain; common SHALE: light green-mint green, light blue green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

17,300-17,330 DOLOMITE: mudstone, light tan, occasional cream-off white, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, occasional spotty light-medium brown oil stain; common SHALE: light green-mint green, light blue green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

17,330-17,360 SHALE: light green-mint green, light blue green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain; DOLOMITE: as above

17,360-17,390 CLAYSTONE: light gray, common gray brown, trace off white-white, firm, sub blocky, earthy, common disseminated pyrite, no visible porosity, no visible oil stain

17,390-17,420 CLAYSTONE: light gray, common gray brown, trace off white-white, firm, sub blocky, earthy, common disseminated pyrite, no visible porosity, no visible oil stain

17,420-17,450 CLAYSTONE: light gray, common gray brown, trace off white-white, firm, sub blocky, earthy, common disseminated pyrite, no visible porosity, no visible oil stain

17,450-17,480 CLAYSTONE: light gray, common gray brown, trace off white-white, firm, sub blocky, earthy, common disseminated pyrite, no visible porosity, no visible oil stain

17,480-17,510 CLAYSTONE: light gray, common gray brown, trace off white-white, trace medium gray, firm, sub blocky, earthy, common disseminated pyrite, no visible porosity, no visible oil stain

17,510-17,540 CLAYSTONE: light gray, common gray brown, trace off white-white, firm, sub blocky, earthy, common disseminated pyrite, no visible porosity, no visible oil stain

17,540-17,570 CLAYSTONE: light gray, common gray brown, trace off white-white, firm, sub blocky, earthy, common disseminated pyrite, no visible porosity, no visible oil stain

17,570-17,600 CLAYSTONE: light gray, common gray brown, trace off white-white, firm, sub blocky, earthy, common disseminated pyrite, no visible porosity, no visible oil stain

17,600-17,630 CLAYSTONE: light gray, common gray brown, trace off white-white, firm, sub blocky, earthy, common disseminated pyrite, no visible porosity, no visible oil stain; DOLOMITE: mudstone, light tan, occasional cream-off white, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, occasional spotty light-medium brown oil stain; common SHALE: light green-mint green, light blue green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

17,630-17,660 DOLOMITE: mudstone, light tan, occasional cream-off white, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, occasional spotty light-medium brown oil stain; common SHALE: light green-mint green, light blue green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

17,660-17,690 DOLOMITE: mudstone, light tan, occasional cream-off white, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, occasional spotty light-medium brown oil stain; common SHALE: light green-mint green, light blue green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

17,690-17,720 DOLOMITE: mudstone, light-medium brown, light brown gray, trace cream-off white, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, occasional spotty light-medium brown oil stain; common SHALE: light green-mint green, light blue green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

17,720-17,750 DOLOMITE: mudstone, light-medium brown, light brown gray, trace cream-off white, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, occasional spotty light-medium brown oil stain; common SHALE: light green-mint green, light blue green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

17,750-17,780 DOLOMITE: mudstone, light-medium brown, light brown gray, trace cream-off white, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, occasional spotty light-medium brown oil stain; common SHALE: light green-mint green, light blue green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

17,780-17,810 DOLOMITE: mudstone, light-medium brown, light brown gray, trace cream-off white, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, occasional spotty light-medium brown oil stain; common SHALE: light green-mint green, light blue green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

17,810-17,840 DOLOMITE: mudstone, light-medium brown, light brown gray, trace cream-off white, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, occasional spotty light-medium brown oil stain; common SHALE: light green-mint green, light blue green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

17,840-17,870 DOLOMITE: mudstone, light-medium brown, light brown gray, trace cream-off white, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, occasional spotty light-medium brown oil stain; common SHALE: light green-mint green, light blue green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

17,870-17,900 DOLOMITE: mudstone, light brown-light gray brown, light gray, trace cream-off white, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, occasional spotty light-medium brown oil stain; common SHALE: light green-mint green, light blue green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

17,900-17,930 DOLOMITE: mudstone, light brown-light gray brown, light gray, trace cream-off white, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, occasional spotty light-medium brown oil stain; common SHALE: light green-mint green, light blue green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

17,930-17,960 DOLOMITE: mudstone, light brown-light gray brown, light gray, trace cream-off white, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, occasional spotty light-medium brown oil stain; common SHALE: light green-mint green, light blue green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

17,960-17,990 DOLOMITE: mudstone, light brown-light gray brown, light gray, trace cream-off white, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, occasional spotty light-medium brown oil stain; common SHALE: light green-mint green, light blue green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

17,990-18,020 DOLOMITE: mudstone, light brown-light gray brown, light gray, trace cream-off white, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, occasional spotty light-medium brown oil stain; common SHALE: light green-mint green, light blue green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

18,020-18,050 DOLOMITE: mudstone, light gray brown, light gray, trace cream-off white, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, occasional spotty light-medium brown oil stain; common SHALE: light green-mint green, light blue green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

18,050-18,080 DOLOMITE: mudstone, light gray brown, light gray, trace cream-off white, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, occasional spotty light-medium brown oil stain; common SHALE: light green-mint green, light blue green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

18,080-18,110 CLAYSTONE: light gray, common gray brown, rare medium gray, trace off white-white, firm, sub blocky, earthy, common disseminated pyrite, no visible porosity, no visible oil stain; rare DOLOMITE and SHALE: as above

18,110-18,140 CLAYSTONE: light gray, common gray brown, rare medium gray, trace off white-white, firm, sub blocky, earthy, common disseminated pyrite, no visible porosity, no visible oil stain

18,140-18,170 CLAYSTONE: light gray, common gray brown, rare medium gray, trace off white-white, firm, sub blocky, earthy, common disseminated pyrite, no visible porosity, no visible oil stain

18,170-18,200 CLAYSTONE: light gray, common gray brown, rare medium gray, trace off white-white, firm, sub blocky, earthy, common disseminated pyrite, no visible porosity, no visible oil stain

18,200-18,230 CLAYSTONE: light gray, common gray brown, rare medium gray, trace off white-white, firm, sub blocky, earthy, common disseminated pyrite, no visible porosity, no visible oil stain

18,230-18,260 CLAYSTONE: light gray, common gray brown, rare medium gray, trace off white-white, firm, sub blocky, earthy, common disseminated pyrite, no visible porosity, no visible oil stain

18,260-18,290 CLAYSTONE: light gray, common gray brown, rare medium gray, trace off white-white, firm, sub blocky, earthy, common disseminated pyrite, no visible porosity, no visible oil stain

18,290-18,320 CLAYSTONE: light gray, common gray brown, rare medium gray, trace off white-white, firm, sub blocky, earthy, common disseminated pyrite, no visible porosity, no visible oil stain

182,320-18,350 CLAYSTONE: light gray, common gray brown, rare medium gray, trace off white-white, firm, sub blocky, earthy, common disseminated pyrite, no visible porosity, no visible oil stain

18,350-18,380 CLAYSTONE: light gray, common gray brown, rare medium gray, trace off white-white, firm, sub blocky, earthy, common disseminated pyrite, no visible porosity, no visible oil stain

18,380-18,410 CLAYSTONE: light gray, common gray brown, rare medium gray, trace off white-white, firm, sub blocky, earthy, common disseminated pyrite, no visible porosity, no visible oil stain

18,410-18,440 CLAYSTONE: light gray, common gray brown, rare medium gray, trace off white-white, firm, sub blocky, earthy, common disseminated pyrite, no visible porosity, no visible oil stain

18,440-18,470 CLAYSTONE: light gray, common gray brown, rare medium gray, trace off white-white, firm, sub blocky, earthy, common disseminated pyrite, no visible porosity, no visible oil stain

18,470-18,500 CLAYSTONE: light gray, common gray brown, rare medium gray, trace off white-white, firm, sub blocky, earthy, common disseminated pyrite, no visible porosity, no visible oil stain

18,500-18,530 DOLOMITE: mudstone, light-medium brown, light brown gray, trace cream-off white, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, occasional spotty light-medium brown oil stain; common SHALE: light green-mint green, light blue green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

18,530-18,560 DOLOMITE: mudstone, light-medium brown, light brown gray, trace cream-off white, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, occasional spotty light-medium brown oil stain; common SHALE: light green-mint green, light blue green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

18,560-18,590 DOLOMITE: mudstone, light-medium brown, light-medium brown gray, rare tan, trace light pink orange, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty trace light brown oil stain; common SHALE: light green-mint green, blue green, trace light gray, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain; moderately yellow green streaming cut fluorescence

18,590-18,620 DOLOMITE: mudstone, light-medium brown, light-medium brown gray, rare tan, trace light pink orange, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty trace light brown oil stain; common SHALE: light green-mint green, blue green, trace light gray, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain; moderately yellow green streaming cut fluorescence

18,620-18,650 DOLOMITE: mudstone, light-medium brown, light-medium brown gray, rare tan, trace light pink orange, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty trace light brown oil stain; common SHALE: light green-mint green, blue green, trace light gray, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain; moderately yellow green streaming cut fluorescence

18,650-18,680 DOLOMITE: mudstone, light-medium brown, light-medium brown gray, rare tan, trace light pink orange, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty trace light brown oil stain; common SHALE: light green-mint green, blue green, trace light gray, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain; contaminated fluorescence cut

18,680-18,710 DOLOMITE: mudstone, light-medium brown, light-medium brown gray, rare tan, trace light pink orange, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty trace light brown oil stain; common SHALE: light green-mint green, blue green, trace light gray, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain; contaminated fluorescence cut

18,710-18,740 DOLOMITE: mudstone, light-medium brown, light-medium brown gray, rare tan, trace light pink orange, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty trace light brown oil stain; common SHALE: light green-mint green, blue green, trace light gray, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain; contaminated fluorescence cut

18,740-18,770 DOLOMITE: mudstone, light-medium brown, light-medium brown gray, rare tan, trace light pink orange, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty trace light brown oil stain; common SHALE: light green-mint green, blue green, trace light gray, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain; contaminated fluorescence cut

18,770-18,800 DOLOMITE: mudstone, light-medium brown, light-medium brown gray, rare tan, trace light pink orange, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty trace light brown oil stain; common SHALE: light green-mint green, blue green, trace light gray, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain; contaminated fluorescence cut

18,800-18,830 DOLOMITE: mudstone, light-medium brown, light-medium brown gray, rare tan, trace light pink orange, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty

trace light brown oil stain; common SHALE: light green-mint green, blue green, trace light gray, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain; contaminated fluorescence cut

18,830-18,860 DOLOMITE: mudstone, light-medium brown, light-medium brown gray, rare tan, trace light pink orange, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty trace light brown oil stain; common SHALE: light green-mint green, blue green, trace light gray, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain; contaminated fluorescence cut

18,860-18,890 DOLOMITE: mudstone, light-medium brown, light-medium brown gray, rare tan, trace light pink orange, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty trace light brown oil stain; common SHALE: light green-mint green, blue green, trace light gray, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain; contaminated fluorescence cut

18,890-18,920 DOLOMITE: mudstone, light-medium brown, rare tan-cream, trace light pink orange, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty trace light brown oil stain; common SHALE: light green-mint green, blue green, trace light gray, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

18,920-18,950 DOLOMITE: mudstone, light-medium brown, rare tan-cream, trace light pink orange, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty trace light brown oil stain; common SHALE: light green-mint green, blue green, trace light gray, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

18,950-18,980 DOLOMITE: mudstone, light-medium brown, rare tan-cream, trace light pink orange, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty trace light brown oil stain; common SHALE: light green-mint green, blue green, trace light gray, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

18,980-19,010 DOLOMITE: mudstone, light-medium brown, rare tan-cream, trace light pink orange, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty trace light brown oil stain; common SHALE: light green-mint green, blue green, trace light gray, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

19,010-19,040 DOLOMITE: mudstone, light-medium brown, rare tan-cream, trace light pink orange, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty trace light brown oil stain; common SHALE: light green-mint green, blue green, trace light gray, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

19,040-19,070 DOLOMITE: mudstone, light-medium brown, rare tan-cream, trace light pink orange, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty trace light brown oil stain; common SHALE: light green-mint green, blue green, trace light gray, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

19,070-19,100 DOLOMITE: mudstone, light-medium brown, rare tan-cream, trace light pink orange, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, rare spotty trace light brown oil stain; common SHALE: light green-mint green, blue green, trace light gray, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

19,100-19,130 DOLOMITE: mudstone, light-medium brown, light brown gray, trace cream-off white, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, occasional spotty light-medium brown oil stain; common SHALE: light green-mint green, light blue green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

19,130-19,160 DOLOMITE: mudstone, light-medium brown, light brown gray, trace cream-off white, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, occasional spotty light-medium brown oil stain; common SHALE: light green-mint green, light blue green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

19,160-19,190 DOLOMITE: mudstone, light-medium brown, light brown gray, trace cream-off white, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, occasional spotty

light-medium brown oil stain; common SHALE: light green-mint green, light blue green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

19,190-19,220 DOLOMITE: mudstone, light-medium brown, light brown gray, trace cream-off white, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, occasional spotty light-medium brown oil stain; common SHALE: light green-mint green, light blue green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

19,220-19,250 DOLOMITE: mudstone, light-medium brown, common light gray, rare cream-off white, trace peach, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, occasional spotty light-medium brown oil stain; common SHALE: light green-mint green, light blue green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

19,250-19,280 DOLOMITE: mudstone, light-medium brown, common light gray, rare cream-off white, trace peach, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, occasional spotty light-medium brown oil stain; common SHALE: light green-mint green, light blue green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

19,280-19,310 DOLOMITE: mudstone, light-medium brown, common light gray, rare cream-off white, trace peach, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, occasional spotty light-medium brown oil stain; common SHALE: light green-mint green, light blue green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

19,310-19,340 DOLOMITE: mudstone, light-medium brown, common light gray, rare cream-off white, trace peach, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, occasional spotty light-medium brown oil stain; common SHALE: light green-mint green, light blue green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

19,340-19,370 DOLOMITE: mudstone, light-medium brown, common light gray, rare cream-off white, trace peach, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, occasional spotty light-medium brown oil stain; common SHALE: light green-mint green, light blue green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

19,370-19,400 DOLOMITE: mudstone, light-medium brown, common light gray, rare cream-off white, trace peach, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, occasional spotty light-medium brown oil stain; common SHALE: light green-mint green, light blue green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

19,400-19,430 DOLOMITE: mudstone, light brown, common light gray, rare cream-off white, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, occasional spotty light-medium brown oil stain; common SHALE: light green-mint green, light blue green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

19,430-19,460 DOLOMITE: mudstone, light brown, common light gray, rare cream-off white, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, occasional spotty light-medium brown oil stain; common SHALE: light green-mint green, light blue green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

19,460-19,490 DOLOMITE: mudstone, light brown, common light gray, rare cream-off white, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, occasional spotty light-medium brown oil stain; common SHALE: light green-mint green, light blue green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

19,490-19,520 DOLOMITE: mudstone, light brown, common light gray, rare cream-off white, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, occasional spotty light-medium brown oil stain; common SHALE: light green-mint green, light blue green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

19,520-19,550 DOLOMITE: mudstone, light brown, common light gray, rare cream-off white, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, occasional spotty light-medium brown

oil stain; common SHALE: light green-mint green, light blue green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

19,550-19,580 DOLOMITE: mudstone, light brown, common light gray, rare cream-off white, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, occasional spotty light-medium brown oil stain; common SHALE: light green-mint green, light blue green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

19,580-19,610 DOLOMITE: mudstone, light brown, common light gray, rare cream-off white, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, occasional spotty light-medium brown oil stain; common SHALE: light green-mint green, light blue green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

19,610-19,640 DOLOMITE: mudstone, light brown, common light gray, rare cream-off white, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, occasional spotty light-medium brown oil stain; common SHALE: light green-mint green, light blue green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

19,640-19,670 DOLOMITE: mudstone, light brown, common light gray, rare cream-off white, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, occasional spotty light-medium brown oil stain; common SHALE: light green-mint green, light blue green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

19,670-19,700 CLAYSTONE: light gray, common gray brown, rare medium gray, trace off white-white, firm, sub blocky, earthy, common disseminated pyrite, no visible porosity, no visible oil stain; rare DOLOMITE and SHALE: as above

19,700-19,730 CLAYSTONE: light gray, common gray brown, rare medium gray, trace off white-white, firm, sub blocky, earthy, common disseminated pyrite, no visible porosity, no visible oil stain

19,730-19,760 CLAYSTONE: light gray, common gray brown, rare medium gray, trace off white-white, firm, sub blocky, earthy, common disseminated pyrite, no visible porosity, no visible oil stain

19,760-19,790 CLAYSTONE: light gray, common gray brown, rare medium gray, trace off white-white, firm, sub blocky, earthy, common disseminated pyrite, no visible porosity, no visible oil stain

19,790-19,820 CLAYSTONE: light gray, common gray brown, rare medium gray, trace off white-white, firm, sub blocky, earthy, common disseminated pyrite, no visible porosity, no visible oil stain

19,820-19,850 CLAYSTONE: light gray, common gray brown, rare medium gray, trace off white-white, firm, sub blocky, earthy, common disseminated pyrite, no visible porosity, no visible oil stain

19,850-19,880 CLAYSTONE: light gray, common gray brown, rare medium gray, trace off white-white, firm, sub blocky, earthy, common disseminated pyrite, no visible porosity, no visible oil stain

19,880-19,910 CLAYSTONE: light gray, common gray brown, rare medium gray, trace off white-white, firm, sub blocky, earthy, common disseminated pyrite, no visible porosity, no visible oil stain

19,910-19,940 CLAYSTONE: light gray, common gray brown, rare medium gray, trace off white-white, firm, sub blocky, earthy, common disseminated pyrite, no visible porosity, no visible oil stain

19,940-19,970 CLAYSTONE: light gray, common gray brown, rare medium gray, trace off white-white, firm, sub blocky, earthy, common disseminated pyrite, no visible porosity, no visible oil stain

19,970-20,000 CLAYSTONE: light gray, common gray brown, rare medium gray, trace off white-white, firm, sub blocky, earthy, common disseminated pyrite, no visible porosity, no visible oil stain

20,000-20,030 CLAYSTONE: light gray, common gray brown, rare medium gray, trace off white-white, firm, sub blocky, earthy, common disseminated pyrite, no visible porosity, no visible oil stain

20,030-20,060 CLAYSTONE: light gray, common gray brown, rare medium gray, trace off white-white, firm, sub blocky, earthy, common disseminated pyrite, no visible porosity, no visible oil stain

20,060-20,090 CLAYSTONE: light gray, common gray brown, rare medium gray, trace off white-white, firm, sub blocky, earthy, common disseminated pyrite, no visible porosity, no visible oil stain

20,090-20,120 CLAYSTONE: light gray, common gray brown, rare medium gray, trace off white-white, firm, sub blocky, earthy, common disseminated pyrite, no visible porosity, no visible oil stain

20,120-20,150 CLAYSTONE: light gray, common gray brown, rare medium gray, trace off white-white, firm, sub blocky, earthy, common disseminated pyrite, no visible porosity, no visible oil stain

20,150-20,180 CLAYSTONE: light gray, common gray brown, rare medium gray, trace off white-white, firm, sub blocky, earthy, common disseminated pyrite, no visible porosity, no visible oil stain

20,180-20,210 CLAYSTONE: light gray, common gray brown, rare medium gray, trace off white-white, firm, sub blocky, earthy, common disseminated pyrite, no visible porosity, no visible oil stain

20,210-20,240 CLAYSTONE: light gray, common gray brown, rare medium gray, trace off white-white, firm, sub blocky, earthy, common disseminated pyrite, no visible porosity, no visible oil stain

20,240-20,270 DOLOMITE: mudstone, light-medium brown, light brown gray, trace cream-off white, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, occasional spotty light-medium brown oil stain; common SHALE: light green-mint green, light blue green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

20,270-20,300 DOLOMITE: mudstone, light-medium brown, light brown gray, trace cream-off white, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, occasional spotty light-medium brown oil stain; common SHALE: light green-mint green, light blue green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

20,300-20,330 DOLOMITE: mudstone, light-medium brown, light brown gray, trace cream-off white, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, occasional spotty light-medium brown oil stain; common SHALE: light green-mint green, light blue green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

20,330-20,360 DOLOMITE: mudstone, light-medium brown, light brown gray, trace cream-off white, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, occasional spotty light-medium brown oil stain; common SHALE: light green-mint green, light blue green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

20,360-20,390 DOLOMITE: mudstone, light-medium brown, light brown gray, trace cream-off white, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, occasional spotty light-medium brown oil stain; common SHALE: light green-mint green, light blue green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

20,390-20,420 DOLOMITE: mudstone, light-medium brown, light brown gray, trace cream-off white, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, occasional spotty light-medium brown oil stain; common SHALE: light green-mint green, light blue green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

20,420-20,450 DOLOMITE: mudstone, light-medium brown, light brown gray, trace cream-off white, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, occasional spotty light-medium brown oil stain; common SHALE: light green-mint green, light blue green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

20,450-20,480 DOLOMITE: mudstone, light-medium brown, light brown gray, trace cream-off white, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, occasional spotty light-medium brown oil stain; common SHALE: light green-mint green, light blue green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

20,480-20,510 DOLOMITE: mudstone, light-medium brown, light brown gray, trace cream-off white, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, occasional spotty

light-medium brown oil stain; common SHALE: light green-mint green, light blue green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

20,510-20,540 DOLOMITE: mudstone, light-medium brown, light brown gray, trace cream-off white, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, occasional spotty light-medium brown oil stain; common SHALE: light green-mint green, light blue green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

20,540-20,561 DOLOMITE: mudstone, light-medium brown, light brown gray, trace cream-off white, very fine crystalline, firm, laminated, micro sucrosic, rare disseminated pyrite, common intercrystalline porosity, occasional spotty light-medium brown oil stain; common SHALE: light green-mint green, light blue green, firm, sub blocky, earthy, occasional disseminated pyrite, possible intergranular porosity, no visible oil stain

ENSECO
Directional Drilling

Directional Survey Certification

Operator: Oasis Petroleum LLC **Well Name:** Kline Federal 5300 31-18 7T **API:** 33-053-06056

Enseco Job#: S15073-02 **Job Type:** MWD D&I **County, State:** McKenzie County, N. Dakota

Well Surface Hole Location (SHL): Lot 3, Sec. 18, T153N, R100W (2490' FSL & 238 FWL)

Latitude: 48° 04' 27.840 N **Longitude:** 103° 36' 11.380 W **Datum:** Nad 83

Final MWD Report Date: Feb. 21, 2015 **MWD Survey Run Date:** Feb. 20, 2015 to Feb. 21, 2015

Tied In to Surveys Provided By: Enseco Directional Drilling D&I MWD **MD:** Surface

MWD Surveyed from 00 **ft to** 2,061.0 **ft MD** **Survey Type:** Positive Pulse D&I MWD **Sensor to Bit:** 63 **ft**

Rig Contractor: Noble **Rig Number:** 2 **RKB Height:** 2,026.0 **ft** **GL Elevation:** 2,026.0 **ft**

MWD Surveyor Name: Brett McClain

"The data and calculations for this survey have been checked by me and conform to the calibration standards and operational procedures set forth by Enseco Energy Services USA Corp. I am authorized and qualified to review the data, calculations and this report and that the report represents a true and correct Directional Survey of this well based on the original data corrected to True North and obtained at the well site. Wellbore coordinates are calculated using the minimum curvature method."

Jonathan Hovland, Well Planner	Jonathan Hovland	February 27th 2015
Enseco Representative Name, Title	**Signature**	**Date Signed**

On this the __day of ___, 20__, before me personally appeared First & Last Name, to me known as the person described in and who executed the foregoing instrument and acknowledged the (s)he executed the same as his/her free act and deed.

Seal: _____ _____

Notary Public **Commission Expiry**

Enseco Survey Report

27 February, 2015

Oasis Petroleum LLC

McKenzie County, North Dakota
Lot 3 Sec.18 Twp.153N Rge.100W
Kline Federal 5300 31-18 7T
Job # S15073-02
API#: 33-053-06056

Survey: Final Surveys Vertical Section

ENSECO Energy Services

Survey Report

Company:	Oasis Petroleum LLC	**Local Co-ordinate Reference:**	Well Kline Federal 5300 31-18 7T
Project:	McKenzie County, North Dakota	**Ground Level Elevation:**	2,026.00usft
Site:	Lot 3 Sec.18 Twp.153N Rge.100W	**Wellhead Elevation:**	WELL @ 2026.00usft (Original Well Elev)
Well:	Kline Federal 5300 31-18 7T	**North Reference:**	True
Wellbore:	Job # S15073-02	**Survey Calculation Method:**	Minimum Curvature
Design:	Final Surveys Vertical Section	**Database:**	EDM5000

Project	McKenzie County, North Dakota		
Map System:	US State Plane 1983	**System Datum:**	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	North Dakota Northern Zone		Using geodetic scale factor

Site	Lot 3 Sec.18 Twp.153N Rge.100W				
Site Position:		**Northing:**	407,221.74 usft	**Latitude:**	48° 4' 28.160 N
From:	Lat/Long	**Easting:**	1,210,091.04 usft	**Longitude:**	103° 36' 11.380 W
Position Uncertainty:	0.00 usft	**Slot Radius:**	13-3/16 "	**Grid Convergence:**	-2.309°

Well	Kline Federal 5300 31-18 7T | API#: 33-053-06056				
Well Position	**+N/-S**	-32.43 usft	**Northing:**	407,189.34 usft	**Latitude:**	48° 4' 27.840 N
	+E/-W	0.00 usft	**Easting:**	1,210,089.73 usft	**Longitude:**	103° 36' 11.380 W
Position Uncertainty		0.00 usft	**Wellhead Elevation:**	usft	**Ground Level:**	2,026.00usft

Wellbore	Job # S15073-02				
Magnetics	**Model Name**	**Sample Date**	**Declination (°)**	**Dip Angle (°)**	**Field Strength (nT)**
	IGRF2015	2/27/2015	8.304	72.942	56,271

Design:	Final Surveys Vertical Section	**Survey Error Model:**	Standard ISCWSA MWD Tool
Audit Notes:			
Version:	1.0	**Phase:**	ACTUAL
Tie On Depth:	0.00		

Vertical Section:	**Depth From (TVD) (usft)**	**+N/-S (usft)**	**+E/-W (usft)**	**Direction (°)**
	0.00	0.00	0.00	167.18

ENSECO Energy Services

Survey Report

Company:	Oasis Petroleum LLC	**Local Co-ordinate Reference:**	Well Kline Federal 5300 31-18 7T
Project:	McKenzie County, North Dakota	**Ground Level Elevation:**	2,026.00usft
Site:	Lot 3 Sec.18 Twp.153N Rge.100W	**Wellhead Elevation:**	WELL @ 2026.00usft (Original Well Elev)
Well:	Kline Federal 5300 31-18 7T	**North Reference:**	True
Wellbore:	Job # S15073-02	**Survey Calculation Method:**	Minimum Curvature
Design:	Final Surveys Vertical Section	**Database:**	EDM5000

Survey

MD (usft)	Inc (°)	Azi (°)	TVD (usft)	SS (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
Tie-in from Surface										
0.00	**0.00**	**0.00**	**0.00**	**2,026.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
132.00	0.20	88.50	132.00	1,894.00	0.01	0.23	0.05	0.15	0.15	0.00
245.00	0.70	108.50	245.00	1,781.00	-0.21	1.08	0.44	0.46	0.44	17.70
314.00	0.70	98.70	313.99	1,712.01	-0.41	1.90	0.82	0.17	0.00	-14.20
407.00	0.90	96.00	406.98	1,619.02	-0.57	3.19	1.26	0.22	0.22	-2.90
493.00	0.90	84.20	492.97	1,533.03	-0.57	4.53	1.56	0.22	0.00	-13.72
579.00	0.70	83.80	578.96	1,447.04	-0.44	5.72	1.70	0.23	-0.23	-0.47
669.00	0.60	121.60	668.96	1,357.04	-0.63	6.67	2.10	0.48	-0.11	42.00
751.00	0.90	108.90	750.95	1,275.05	-1.07	7.65	2.74	0.42	0.37	-15.49
839.00	0.60	117.40	838.94	1,187.06	-1.50	8.71	3.40	0.36	-0.34	9.66
927.00	0.30	149.00	926.94	1,099.06	-1.91	9.24	3.91	0.43	-0.34	35.91
1,013.00	0.10	48.40	1,012.94	1,013.06	-2.05	9.41	4.09	0.39	-0.23	-116.98
1,100.00	0.50	256.50	1,099.94	926.06	-2.09	9.10	4.06	0.68	0.46	-174.60
1,189.00	0.60	237.10	1,188.93	837.07	-2.44	8.33	4.22	0.24	0.11	-21.80
1,276.00	0.50	212.00	1,275.93	750.07	-3.01	7.75	4.65	0.30	-0.11	-28.85
1,364.00	0.40	249.90	1,363.93	662.07	-3.44	7.25	4.96	0.35	-0.11	43.07
1,450.00	0.40	315.00	1,449.93	576.07	-3.33	6.76	4.74	0.50	0.00	75.70
1,536.00	0.50	278.00	1,535.92	490.08	-3.06	6.18	4.36	0.35	0.12	-43.02
1,623.00	0.70	234.00	1,622.92	403.08	-3.32	5.37	4.43	0.56	0.23	-50.57
1,711.00	0.70	235.10	1,710.91	315.09	-3.95	4.49	4.85	0.02	0.00	1.25
1,799.00	0.60	252.60	1,798.91	227.09	-4.39	3.61	5.08	0.25	-0.11	19.89
1,886.00	0.80	199.70	1,885.90	140.10	-5.10	2.97	5.63	0.75	0.23	-60.80
1,974.00	0.90	206.20	1,973.89	52.11	-6.30	2.46	6.69	0.16	0.11	7.39
Last MWD Survey										
2,061.00	**1.20**	**206.10**	**2,060.88**	**-34.88**	**-7.73**	**1.76**	**7.93**	**0.34**	**0.34**	**-0.11**

Survey Annotations

		Local Coordinates		
MD (usft)	**TVD (usft)**	**+N/-S (usft)**	**+E/-W (usft)**	**Comment**
0.00	0.00	0.00	0.00	Tie-in from Surface
2,061.00	2,060.88	-7.73	1.76	Last MWD Survey

RYAN DIRECTIONAL SERVICES, INC.
A NABORS COMPANY

19510 Oil Center Blvd
Houston, TX 77073
Bus 281.443.1414
Fax 281.443.1676

Friday, April 24, 2015

State of North Dakota

Subject: **Surveys**

Re: **Oasis**
Kline Federal 5300 31-18 7T
McKenzie, ND

Enclosed, please find the original and one copy of the survey performed on the above-referenced well by Ryan Directional Services, Inc.. Other information required by your office is as follows:

Surveyor Name	*Surveyor Title*	*Borehole Number*	*Start Depth*	*End Depth*	*Start Date*	*End Date*	*Type of*	*TD Straight Line Projection*
Mike McCammond	MWD Operator	O.H.	2081'	11028'	03/27/15	04/02/15	MWD	11028'
Mike McCammond	MWD Operator	O.H.	11028'	20497'	04/18/15	04/22/15	MWD	20561'

If any other information is required please contact the undersigned at the letterhead address or phone number.

Douglas Hudson

Douglas Hudson
Well Planner

RYAN DIRECTIONAL SERVICES, INC.
A NABORS COMPANY

Ryan Directional Services, Inc.
19510 Oil Center Blvd.
Houston, Texas 77073
Bus: 281.443.1414
Fax: 281.443.1676

Thursday, April 02, 2015

State of North Dakota
County of McKenzie

Subject: **Survey Certification Letter**

Survey Company: **Ryan Directional Services, Inc.**
Job Number: **8797**
Survey Job Type: **Ryan MWD**
Customer: **Oasis Petroleum**
Well Name: **Kline Federal 5300 31-18 7T**
Rig Name: **Nabors B-22**

Surface: **48 4' 27.840 N / 103 36' 11.380 W**
A.P.I. No: **33-053-06056**
Location: **McKenzie, ND**
RKB Height: **2008'**
Distance to Bit: **61'**

Surveyor Name	*Surveyor Title*	*Borehole Number*	*Start Depth*	*End Depth*	*Start Date*	*End Date*	*Type of*	*TD Straight Line Projection*
Mike McCammond	MWD Supervisor	OH	2153'	11028'	03/27/15	04/02/15	MWD	11089'

The data and calculations for this survey have been checked by me and conform to the calibration standards and operational procedures set forth by Ryan Directional Services, Inc. I am authorized and qualified to review the data, calculations and these reports; the reports represents true and correct Directional Surveys of this well based on the original data, the minimum curvature method, corrected to True North and obtained at the well site.

Mike McCammond
MWD Supervisor
Ryan Directional Services, Inc.

RYAN DIRECTIONAL SERVICES, INC.
A NABORS COMPANY

Ryan Directional Services, Inc.
19510 Oil Center Blvd.
Houston, Texas 77073
Bus: 281.443.1414
Fax: 281.443.1676

Wednesday, April 22, 2015

State of North Dakota
County of McKenzie

Subject: **Survey Certification Letter**

Survey Company: **Ryan Directional Services, Inc.**
Job Number: **8831**
Survey Job Type: **Ryan MWD**
Customer: **Oasis Petroleum**
Well Name: **Kline Federal 5300 31-18 7T**
Rig Name: **Nabors B-22**

Surface: **48 4' 27.840 N / 103 36' 11.380 W**
A.P.I. No: **33-053-06056**
Location: **McKenzie, North Dakota**
RKB Height: **2033'**
Distance to Bit: **64'**

Surveyor Name	*Surveyor Title*	*Borehole Number*	*Start Depth*	*End Depth*	*Start Date*	*End Date*	*Type of*	*TD Straight Line Projection*
Mike McCammond	MWD Supervisor	OH	11136'	20497'	04/18/15	04/22/15	MWD	20561'

The data and calculations for this survey have been checked by me and conform to the calibration standards and operational procedures set forth by Ryan Directional Services, Inc. I am authorized and qualified to review the data, calculations and these reports; the reports represents true and correct Directional Surveys of this well based on the original data, the minimum curvature method, corrected to True North and obtained at the well site.

Mike McCammond
MWD Supervisor
Ryan Directional Services, Inc.

Report #: 1

Date:

RYAN DIRECTIONAL SERVICES, INC.

A NABORS COMPANY

Ryan Job # 8797

SURVEY REPORT

Customer: Oasis Petroleum
Well Name: Kline Federal 5300 31-18 7T
Rig #: Nabors B-22
API #: 33-053-06056
Calculation Method: Minimum Curvature Calculation

MWD Operator: M.McCammond/S.Hayman
Directional Drillers: RPM
Survey Corrected To: True North
Vertical Section Direction: 90
Total Correction: 8.30
Temperature Forecasting Model (Chart Only): Logarithmic

Survey #	MD	Inc	Azm	Temp	TVD	VS	N/S	E/W	DLS
Tie in to Gyro Surveys									
Tie In	**2061**	**1.20**	**206.10**		**2060.88**	**-7.73**	**-7.73**	**1.76**	**0.34**
1	2153	1.30	204.10	71.00	2152.86	0.91	-9.55	0.91	0.12
2	2246	1.40	206.90	78.00	2245.83	-0.03	-11.52	-0.03	0.13
3	2340	1.20	59.50	82.00	2339.82	0.29	-12.05	0.29	2.66
4	2433	1.70	64.00	84.00	2432.79	2.37	-10.95	2.37	0.55
5	**2526**	**1.80**	**62.50**	**87.00**	**2525.75**	**4.91**	**-9.67**	**4.91**	**0.12**
6	2620	0.60	349.70	89.00	2619.73	6.13	-8.50	6.13	1.83
7	2713	0.50	331.60	91.00	2712.73	5.85	-7.67	5.85	0.21
8	2807	0.40	322.60	93.00	2806.72	5.46	-7.05	5.46	0.13
9	2900	0.40	332.30	95.00	2899.72	5.11	-6.50	5.11	0.07
10	**2993**	**0.70**	**348.40**	**96.00**	**2992.72**	**4.84**	**-5.66**	**4.84**	**0.36**
11	3087	0.60	332.20	100.00	3086.71	4.50	-4.66	4.50	0.22
12	3180	0.70	345.00	102.00	3179.71	4.12	-3.68	4.12	0.19
13	3274	0.70	341.20	104.00	3273.70	3.79	-2.58	3.79	0.05
14	3367	0.60	344.80	105.00	3366.69	3.48	-1.57	3.48	0.12
15	**3460**	**0.70**	**341.10**	**107.00**	**3459.69**	**3.17**	**-0.57**	**3.17**	**0.12**
16	3554	0.90	346.60	109.00	3553.68	2.81	0.69	2.81	0.23
17	3647	0.90	346.90	111.00	3646.67	2.48	2.12	2.48	0.01
18	3741	0.80	349.90	113.00	3740.66	2.19	3.48	2.19	0.12
19	3834	0.60	348.40	114.00	3833.65	1.98	4.60	1.98	0.22
20	**3927**	**0.60**	**7.40**	**116.00**	**3926.64**	**1.95**	**5.56**	**1.95**	**0.21**
21	4021	0.40	355.30	118.00	4020.64	1.98	6.37	1.98	0.24
22	4114	0.50	343.20	120.00	4113.64	1.84	7.08	1.84	0.15
23	4208	0.40	203.80	122.00	4207.64	1.59	7.18	1.59	0.90
24	4301	0.60	220.00	123.00	4300.63	1.14	6.51	1.14	0.26
25	**4394**	**0.60**	**236.60**	**123.00**	**4393.63**	**0.42**	**5.87**	**0.42**	**0.19**
26	4488	0.30	249.60	125.00	4487.62	-0.22	5.51	-0.22	0.34
27	4581	0.30	247.10	127.00	4580.62	-0.67	5.33	-0.67	0.01
28	4675	0.10	1.80	129.00	4674.62	-0.89	5.32	-0.89	0.38
29	4768	0.40	21.10	131.00	4767.62	-0.77	5.70	-0.77	0.33
30	**4861**	**0.70**	**106.80**	**132.00**	**4860.62**	**-0.11**	**5.84**	**-0.11**	**0.84**
31	4955	0.30	97.80	134.00	4954.61	0.68	5.64	0.68	0.43
32	5048	0.40	176.10	136.00	5047.61	0.94	5.28	0.94	0.48
33	5141	0.30	259.50	138.00	5140.61	0.73	4.91	0.73	0.51
34	5235	0.50	225.50	138.00	5234.61	0.19	4.58	0.19	0.32
35	**5328**	**0.80**	**226.70**	**140.00**	**5327.60**	**-0.57**	**3.85**	**-0.57**	**0.32**
36	5422	0.70	242.10	143.00	5421.60	-1.56	3.13	-1.56	0.24
37	5515	0.90	257.20	143.00	5514.59	-2.77	2.71	-2.77	0.31
38	5608	0.60	263.30	145.00	5607.58	-3.97	2.49	-3.97	0.33
39	5702	0.70	270.70	147.00	5701.57	-5.03	2.44	-5.03	0.14
40	**5795**	**0.90**	**185.10**	**147.00**	**5794.57**	**-5.66**	**1.72**	**-5.66**	**1.18**
41	5888	0.90	192.30	149.00	5887.55	-5.88	0.27	-5.88	0.12
42	5982	0.70	195.90	150.00	5981.55	-6.20	-1.00	-6.20	0.22
43	6075	0.70	211.30	150.00	6074.54	-6.65	-2.03	-6.65	0.20
44	6168	0.60	204.00	149.00	6167.53	-7.14	-2.96	-7.14	0.14
45	**6262**	**0.80**	**190.80**	**150.00**	**6261.53**	**-7.46**	**-4.06**	**-7.46**	**0.27**
46	6355	0.60	130.20	152.00	6354.52	-7.21	-5.01	-7.21	0.78
47	6448	1.30	145.30	154.00	6447.51	-6.24	-6.19	-6.24	0.79
48	6542	1.60	150.70	156.00	6541.48	-4.99	-8.21	-4.99	0.35
49	6635	1.90	150.90	158.00	6634.43	-3.61	-10.69	-3.61	0.32
50	**6728**	**1.30**	**148.30**	**159.00**	**6727.40**	**-2.30**	**-12.93**	**-2.30**	**0.65**
51	6822	1.40	127.10	159.00	6821.37	-0.83	-14.53	-0.83	0.54
52	6915	0.80	118.50	163.00	6914.35	0.65	-15.53	0.65	0.67
53	7008	0.70	45.90	163.00	7007.35	1.63	-15.44	1.63	0.96
54	7102	1.50	29.90	167.00	7101.33	2.65	-13.98	2.65	0.90
55	**7195**	**1.50**	**35.10**	**168.00**	**7194.30**	**3.96**	**-11.93**	**3.96**	**0.15**
56	7288	1.60	32.00	168.00	7287.26	5.35	-9.83	5.35	0.14
57	7381	1.50	26.20	170.00	7380.23	6.57	-7.64	6.57	0.20
58	7475	1.60	26.00	174.00	7474.19	7.69	-5.35	7.69	0.11
59	7568	0.70	353.40	176.00	7567.18	8.20	-3.62	8.20	1.16
60	**7661**	**0.70**	**344.30**	**177.00**	**7660.17**	**7.98**	**-2.51**	**7.98**	**0.12**
61	7755	0.20	325.80	177.00	7754.17	7.73	-1.82	7.73	0.55
62	7848	0.00	295.70	177.00	7847.17	7.64	-1.69	7.64	0.22
63	7941	0.40	320.30	179.00	7940.16	7.43	-1.44	7.43	0.43
64	8034	0.30	165.50	181.00	8033.16	7.28	-1.42	7.28	0.73
65	**8128**	**0.20**	**189.00**	**183.00**	**8127.16**	**7.32**	**-1.82**	**7.32**	**0.15**

Report #: 1

Date:

RYAN DIRECTIONAL SERVICES, INC.

A NABORS COMPANY

Ryan Job # 8797

SURVEY REPORT

Customer: Oasis Petroleum
Well Name: Kline Federal 5300 31-18 7T
Rig #: Nabors B-22
API #: 33-053-06056
Calculation Method: Minimum Curvature Calculation

MWD Operator: M.McCammond/S.Hayman
Directional Drillers: RPM
Survey Corrected To: True North
Vertical Section Direction: 90
Total Correction: 8.30
Temperature Forecasting Model (Chart Only): Logarithmic

Survey #	MD	Inc	Azm	Temp	TVD	VS	N/S	E/W	DLS
66	8221	0.40	132.50	185.00	8220.16	7.53	-2.20	7.53	0.36
67	8315	0.10	137.20	186.00	8314.16	7.83	-2.49	7.83	0.32
68	8408	0.30	145.20	183.00	8407.16	8.03	-2.74	8.03	0.22
69	8501	0.50	159.10	186.00	8500.16	8.31	-3.32	8.31	0.24
70	**8595**	**0.20**	**173.90**	**188.00**	**8594.16**	**8.47**	**-3.87**	**8.47**	**0.33**
71	8688	0.30	126.00	188.00	8687.16	8.69	-4.17	8.69	0.24
72	8781	0.40	104.70	190.00	8780.15	9.20	-4.40	9.20	0.17
73	8875	0.40	98.40	194.00	8874.15	9.84	-4.53	9.84	0.05
74	8968	0.40	110.90	194.00	8967.15	10.47	-4.69	10.47	0.09
75	**9061**	**0.40**	**89.00**	**177.00**	**9060.15**	**11.09**	**-4.80**	**11.09**	**0.16**
76	9154	0.30	107.10	179.00	9153.15	11.65	-4.87	11.65	0.16
77	9248	0.40	98.50	185.00	9247.14	12.21	-4.99	12.21	0.12
78	9341	0.40	132.10	188.00	9340.14	12.77	-5.26	12.77	0.25
79	9434	0.40	130.00	192.00	9433.14	13.26	-5.68	13.26	0.02
80	**9528**	**0.50**	**101.20**	**195.00**	**9527.14**	**13.92**	**-5.97**	**13.92**	**0.26**
81	9621	0.40	132.10	195.00	9620.13	14.55	-6.27	14.55	0.28
82	9714	0.40	112.90	199.00	9713.13	15.09	-6.61	15.09	0.14
83	9807	0.10	108.80	203.00	9806.13	15.47	-6.77	15.47	0.32
84	9901	0.30	3.60	203.00	9900.13	15.56	-6.55	15.56	0.36
85	**9994**	**0.30**	**337.50**	**204.00**	**9993.13**	**15.49**	**-6.08**	**15.49**	**0.15**
86	10087	0.50	346.70	204.00	10086.13	15.30	-5.46	15.30	0.23
87	10162	0.40	3.60	208.00	10161.12	15.24	-4.88	15.24	0.22
88	10219	0.90	339.00	188.00	10218.12	15.09	-4.26	15.09	0.99
89	10250	0.80	75.50	194.00	10249.12	15.21	-3.98	15.21	4.10
90	**10281**	**3.70**	**109.70**	**194.00**	**10280.09**	**16.37**	**-4.27**	**16.37**	**9.91**
91	10312	7.30	114.40	194.00	10310.94	19.10	-5.42	19.10	11.69
92	10343	11.10	115.90	195.00	10341.54	23.58	-7.53	23.58	12.28
93	10375	14.10	115.90	197.00	10372.77	29.86	-10.58	29.86	9.38
94	10406	16.20	116.30	197.00	10402.69	37.13	-14.15	37.13	6.78
95	**10437**	**18.50**	**117.60**	**197.00**	**10432.27**	**45.37**	**-18.34**	**45.37**	**7.52**
96	10468	21.30	120.10	197.00	10461.42	54.60	-23.45	54.60	9.44
97	10499	24.40	120.50	197.00	10489.98	64.99	-29.52	64.99	10.01
98	10530	28.00	122.40	199.00	10517.80	76.66	-36.67	76.66	11.92
99	10561	30.30	122.50	199.00	10544.87	89.40	-44.78	89.40	7.42
100	**10593**	**32.70**	**120.00**	**199.00**	**10572.15**	**103.70**	**-53.44**	**103.70**	**8.54**
101	10624	36.10	117.90	183.00	10597.73	119.02	-61.90	119.02	11.61
102	10655	39.50	118.90	183.00	10622.22	135.73	-70.94	135.73	11.14
103	10686	44.00	120.30	183.00	10645.34	153.67	-81.14	153.67	14.82
104	10717	49.40	121.40	185.00	10666.59	173.03	-92.72	173.03	17.61
105	**10748**	**53.90**	**122.60**	**186.00**	**10685.82**	**193.63**	**-105.60**	**193.63**	**14.83**
106	10779	57.30	122.60	186.00	10703.33	215.18	-119.38	215.18	10.97
107	10811	58.40	122.70	186.00	10720.36	237.99	-134.00	237.99	3.45
108	10842	61.80	122.10	186.00	10735.81	260.68	-148.39	260.68	11.10
109	10873	66.40	121.50	188.00	10749.35	284.37	-163.08	284.37	14.94
110	**10904**	**72.00**	**121.60**	**188.00**	**10760.36**	**309.06**	**-178.24**	**309.06**	**18.07**
111	10935	77.50	121.80	188.00	10768.51	334.50	-193.95	334.50	17.75
112	10966	82.80	122.60	190.00	10773.81	360.33	-210.22	360.33	17.28
113	10997	87.60	120.30	192.00	10776.40	386.68	-226.33	386.68	17.16
114	11028	88.00	117.50	192.00	10777.59	413.79	-241.30	413.79	9.12
115	**11072**	**87.40**	**120.40**	**228.00**	**10779.36**	**452.26**	**-262.58**	**452.26**	**6.73**
116	11104	88.60	118.10	230.00	10780.47	480.16	-278.20	480.16	8.10
117	11134	90.10	117.40	230.00	10780.81	506.71	-292.17	506.71	5.52
118	11164	90.20	116.30	230.00	10780.74	533.47	-305.72	533.47	3.68
119	11195	90.60	115.00	230.00	10780.52	561.42	-319.14	561.42	4.39
120	**11226**	**90.60**	**113.60**	**230.00**	**10780.19**	**589.67**	**-331.89**	**589.67**	**4.52**
121	11258	91.00	112.30	230.00	10779.75	619.13	-344.37	619.13	4.25
122	11288	91.30	112.10	230.00	10779.15	646.90	-355.70	646.90	1.20
123	11318	90.70	110.00	230.00	10778.62	674.89	-366.48	674.89	7.28
124	11348	90.10	109.60	231.00	10778.41	703.12	-376.64	703.12	2.40
125	**11379**	**89.20**	**109.10**	**231.00**	**10778.60**	**732.37**	**-386.91**	**732.37**	**3.32**
126	11410	89.90	107.90	231.00	10778.85	761.76	-396.74	761.76	4.48
127	11440	89.30	108.30	233.00	10779.06	790.28	-406.06	790.28	2.40
128	11472	88.40	107.80	233.00	10779.70	820.70	-415.98	820.70	3.22
129	11503	87.60	106.40	231.00	10780.78	850.31	-425.09	850.31	5.20
130	**11533**	**87.60**	**106.70**	**233.00**	**10782.04**	**879.04**	**-433.63**	**879.04**	**1.00**

Report #: 1

Date:

RYAN DIRECTIONAL SERVICES, INC.

A NABORS COMPANY

Ryan Job # 8797

SURVEY REPORT

Customer: Oasis Petroleum
Well Name: Kline Federal 5300 31-18 7T
Rig #: Nabors B-22
API #: 33-053-06056
Calculation Method: Minimum Curvature Calculation

MWD Operator: M.McCammond/S.Hayman
Directional Drillers: RPM
Survey Corrected To: True North
Vertical Section Direction: 90
Total Correction: 8.30
Temperature Forecasting Model (Chart Only): Logarithmic

Survey #	MD	Inc	Azm	Temp	TVD	VS	N/S	E/W	DLS
131	11563	88.60	105.20	233.00	10783.03	907.87	-441.86	907.87	6.01
132	11594	89.30	102.60	233.00	10783.60	937.95	-449.31	937.95	8.68
133	11624	89.40	102.50	235.00	10783.94	967.23	-455.83	967.23	0.47
134	11655	89.10	102.20	235.00	10784.34	997.51	-462.46	997.51	1.37
135	**11687**	**90.00**	**100.50**	**235.00**	**10784.60**	**1028.88**	**-468.75**	**1028.88**	**6.01**
136	11718	90.70	100.40	237.00	10784.41	1059.37	-474.38	1059.37	2.28
137	11750	91.20	99.90	237.00	10783.88	1090.86	-480.02	1090.86	2.21
138	11781	91.50	97.40	235.00	10783.15	1121.50	-484.68	1121.50	8.12
139	11813	91.70	96.80	239.00	10782.25	1153.24	-488.63	1153.24	1.98
140	**11844**	**91.90**	**96.40**	**239.00**	**10781.28**	**1184.02**	**-492.19**	**1184.02**	**1.44**
141	11875	92.40	95.10	237.00	10780.12	1214.84	-495.30	1214.84	4.49
142	11906	92.00	94.00	239.00	10778.93	1245.72	-497.75	1245.72	3.77
143	11936	91.20	93.60	239.00	10778.09	1275.64	-499.74	1275.64	2.98
144	11967	89.70	93.10	239.00	10777.84	1306.59	-501.55	1306.59	5.10
145	**11997**	**91.10**	**93.20**	**242.00**	**10777.63**	**1336.54**	**-503.20**	**1336.54**	**4.68**
146	12028	91.40	92.80	242.00	10776.96	1367.49	-504.82	1367.49	1.61
147	12059	91.70	92.90	240.00	10776.12	1398.44	-506.36	1398.44	1.02
148	12153	90.10	91.50	242.00	10774.64	1492.36	-509.97	1492.36	2.26
149	12248	88.50	90.50	244.00	10775.80	1587.33	-511.63	1587.33	1.99
150	**12343**	**88.10**	**90.30**	**246.00**	**10778.62**	**1682.29**	**-512.29**	**1682.29**	**0.47**
151	12438	90.00	90.90	248.00	10780.20	1777.26	-513.29	1777.26	2.10
152	12533	91.60	91.00	249.00	10778.87	1872.24	-514.86	1872.24	1.69
153	12628	89.00	88.70	248.00	10778.37	1967.22	-514.61	1967.22	3.65
154	12722	88.90	87.90	249.00	10780.10	2061.16	-511.82	2061.16	0.86
155	**12817**	**88.20**	**89.80**	**249.00**	**10782.50**	**2156.11**	**-509.92**	**2156.11**	**2.13**
156	12912	88.10	88.40	251.00	10785.57	2251.04	-508.43	2251.04	1.48
157	13007	88.70	88.60	253.00	10788.22	2345.97	-505.94	2345.97	0.67
158	13102	89.10	89.00	255.00	10790.04	2440.94	-503.95	2440.94	0.60
159	13197	89.70	88.50	255.00	10791.04	2535.91	-501.88	2535.91	0.82
160	**13291**	**92.00**	**88.00**	**251.00**	**10789.64**	**2629.85**	**-499.01**	**2629.85**	**2.50**
161	13386	89.70	90.00	253.00	10788.23	2724.81	-497.35	2724.81	3.21
162	13481	89.00	90.70	253.00	10789.31	2819.80	-497.93	2819.80	1.04
163	13576	89.90	92.20	253.00	10790.22	2914.76	-500.34	2914.76	1.84
164	13671	90.10	92.30	253.00	10790.22	3009.69	-504.07	3009.69	0.24
165	**13765**	**89.50**	**91.40**	**257.00**	**10790.55**	**3103.64**	**-507.10**	**3103.64**	**1.15**
166	13860	89.50	91.70	258.00	10791.38	3198.60	-509.67	3198.60	0.32
167	13955	89.60	91.60	258.00	10792.13	3293.56	-512.40	3293.56	0.15
168	14050	89.00	92.10	260.00	10793.29	3388.50	-515.47	3388.50	0.82
169	14145	88.90	91.80	260.00	10795.03	3483.43	-518.70	3483.43	0.33
170	**14240**	**90.30**	**90.90**	**258.00**	**10795.69**	**3578.40**	**-520.94**	**3578.40**	**1.75**
171	14335	92.10	90.80	260.00	10793.70	3673.36	-522.35	3673.36	1.90
172	14429	91.80	90.70	260.00	10790.50	3767.30	-523.58	3767.30	0.34
173	14524	89.40	90.50	260.00	10789.51	3862.28	-524.57	3862.28	2.54
174	14619	88.90	91.40	262.00	10790.92	3957.26	-526.15	3957.26	1.08
175	**14714**	**87.40**	**90.90**	**262.00**	**10793.99**	**4052.19**	**-528.06**	**4052.19**	**1.66**
176	14809	90.00	90.40	262.00	10796.14	4147.15	-529.13	4147.15	2.79
177	14904	91.50	90.70	262.00	10794.90	4242.13	-530.04	4242.13	1.61
178	14998	90.00	88.70	262.00	10793.67	4336.11	-529.55	4336.11	2.66
179	15093	89.80	88.50	264.00	10793.83	4431.09	-527.23	4431.09	0.30
180	**15188**	**89.70**	**88.70**	**264.00**	**10794.25**	**4526.06**	**-524.91**	**4526.06**	**0.24**
181	15283	90.30	86.90	266.00	10794.25	4620.98	-521.26	4620.98	2.00
182	15378	91.90	87.00	266.00	10792.42	4715.83	-516.21	4715.83	1.69
183	15473	90.30	89.90	262.00	10790.60	4810.76	-513.64	4810.76	3.49
184	15567	92.40	89.40	266.00	10788.38	4904.73	-513.07	4904.73	2.30
185	**15662**	**90.90**	**91.00**	**262.00**	**10785.65**	**4999.68**	**-513.40**	**4999.68**	**2.31**
186	15694	90.50	91.10	260.00	10785.26	5031.67	-513.99	5031.67	1.29
187	15725	91.20	91.70	260.00	10784.80	5062.66	-514.74	5062.66	2.97
188	15757	89.40	92.10	258.00	10784.63	5094.64	-515.80	5094.64	5.76
189	15789	88.90	91.40	260.00	10785.11	5126.62	-516.78	5126.62	2.69
190	**15820**	**88.00**	**92.10**	**260.00**	**10785.94**	**5157.60**	**-517.73**	**5157.60**	**3.68**
191	15852	88.40	92.30	260.00	10786.95	5189.56	-518.96	5189.56	1.40
192	15883	88.70	91.70	262.00	10787.73	5220.53	-520.04	5220.53	2.16
193	15915	88.70	92.00	262.00	10788.46	5252.50	-521.07	5252.50	0.94
194	15947	89.60	92.20	262.00	10788.93	5284.48	-522.24	5284.48	2.88
195	**15978**	**90.10**	**92.60**	**262.00**	**10789.02**	**5315.45**	**-523.54**	**5315.45**	**2.07**

Report #: 1

Date:

RYAN DIRECTIONAL SERVICES, INC.

A NABORS COMPANY

Ryan Job # 8797

SURVEY REPORT

Customer: Oasis Petroleum

Well Name: Kline Federal 5300 31-18 7T

Rig #: Nabors B-22

API #: 33-053-06056

Calculation Method: Minimum Curvature Calculation

MWD Operator: M.McCammond/S.Hayman

Directional Drillers: RPM

Survey Corrected To: True North

Vertical Section Direction: 90

Total Correction: 8.30

Temperature Forecasting Model (Chart Only): Logarithmic

Survey #	MD	Inc	Azm	Temp	TVD	VS	N/S	E/W	DLS
196	16010	90.60	92.60	260.00	10788.82	5347.42	-524.99	5347.42	1.56
197	16041	90.00	91.40	260.00	10788.66	5378.40	-526.07	5378.40	4.33
198	16073	88.10	90.80	260.00	10789.19	5410.39	-526.69	5410.39	6.23
199	16105	87.10	91.90	262.00	10790.53	5442.35	-527.44	5442.35	4.64
200	**16136**	**87.40**	**91.80**	**262.00**	**10792.02**	**5473.30**	**-528.44**	**5473.30**	**1.02**
201	16168	87.80	91.10	262.00	10793.36	5505.26	-529.25	5505.26	2.52
202	16199	87.60	91.40	262.00	10794.60	5536.23	-529.93	5536.23	1.16
203	16231	87.70	91.10	264.00	10795.91	5568.19	-530.62	5568.19	0.99
204	16263	87.60	91.40	260.00	10797.22	5600.16	-531.32	5600.16	0.99
205	**16294**	**87.60**	**91.50**	**262.00**	**10798.52**	**5631.12**	**-532.10**	**5631.12**	**0.32**
206	16326	89.30	91.40	262.00	10799.39	5663.10	-532.91	5663.10	5.32
207	16421	88.10	90.90	264.00	10801.54	5758.05	-534.82	5758.05	1.37
208	16516	91.70	90.10	264.00	10801.71	5853.03	-535.65	5853.03	3.88
209	16610	88.70	88.60	264.00	10801.38	5947.01	-534.58	5947.01	3.57
210	**16705**	**88.70**	**88.50**	**266.00**	**10803.54**	**6041.95**	**-532.18**	**6041.95**	**0.11**
211	16800	88.70	89.20	266.00	10805.69	6136.91	-530.27	6136.91	0.74
212	16895	89.90	89.00	266.00	10806.85	6231.89	-528.78	6231.89	1.28
213	16989	89.50	88.10	267.00	10807.34	6325.86	-526.40	6325.86	1.05
214	17084	89.20	88.90	267.00	10808.42	6420.82	-523.92	6420.82	0.90
215	**17179**	**88.80**	**88.60**	**267.00**	**10810.08**	**6515.78**	**-521.84**	**6515.78**	**0.53**
216	17274	89.90	89.70	267.00	10811.16	6610.76	-520.43	6610.76	1.64
217	17369	89.10	90.20	267.00	10811.99	6705.76	-520.35	6705.76	0.99
218	17464	90.40	89.80	266.00	10812.40	6800.75	-520.35	6800.75	1.43
219	17558	91.30	89.90	267.00	10811.01	6894.74	-520.11	6894.74	0.96
220	**17653**	**90.50**	**91.40**	**267.00**	**10809.51**	**6989.72**	**-521.18**	**6989.72**	**1.79**
221	17748	90.30	91.50	267.00	10808.85	7084.69	-523.59	7084.69	0.24
222	17843	90.50	90.80	269.00	10808.19	7179.67	-525.49	7179.67	0.77
223	17937	89.10	91.60	269.00	10808.52	7273.64	-527.46	7273.64	1.72
224	18032	89.10	91.80	269.00	10810.01	7368.59	-530.28	7368.59	0.21
225	**18127**	**89.20**	**92.20**	**269.00**	**10811.42**	**7463.52**	**-533.59**	**7463.52**	**0.43**
226	18222	89.90	91.10	267.00	10812.16	7558.47	-536.33	7558.47	1.37
227	18317	90.30	89.90	269.00	10812.00	7653.47	-537.16	7653.47	1.33
228	18412	91.80	90.50	264.00	10810.26	7748.45	-537.49	7748.45	1.70
229	18506	91.60	90.10	267.00	10807.47	7842.41	-537.98	7842.41	0.48
230	**18601**	**91.40**	**89.00**	**269.00**	**10804.98**	**7937.37**	**-537.24**	**7937.37**	**1.18**
231	18695	90.90	89.80	269.00	10803.10	8031.34	-536.25	8031.34	1.00
232	18790	90.70	89.00	269.00	10801.77	8126.33	-535.26	8126.33	0.87
233	18885	90.20	90.30	269.00	10801.02	8221.32	-534.68	8221.32	1.47
234	18980	91.90	90.50	269.00	10799.28	8316.30	-535.34	8316.30	1.80
235	**19075**	**89.80**	**89.70**	**269.00**	**10797.87**	**8411.28**	**-535.51**	**8411.28**	**2.37**
236	19169	90.20	90.60	269.00	10797.87	8505.28	-535.75	8505.28	1.05
237	19264	90.10	89.90	269.00	10797.62	8600.28	-536.17	8600.28	0.74
238	19359	91.10	90.20	269.00	10796.63	8695.27	-536.25	8695.27	1.10
239	19454	89.50	90.20	269.00	10796.13	8790.27	-536.58	8790.27	1.68
240	**19549**	**89.80**	**90.10**	**269.00**	**10796.71**	**8885.27**	**-536.83**	**8885.27**	**0.33**
241	19643	87.40	91.50	271.00	10799.01	8979.22	-538.14	8979.22	2.96
242	19738	89.10	90.90	267.00	10801.91	9074.15	-540.13	9074.15	1.90
243	19833	89.80	90.80	267.00	10802.82	9169.14	-541.54	9169.14	0.74
244	19928	90.90	89.20	269.00	10802.24	9264.13	-541.54	9264.13	2.04
245	**20023**	**90.50**	**89.60**	**269.00**	**10801.08**	**9359.12**	**-540.54**	**9359.12**	**0.60**
246	20117	91.80	89.00	267.00	10799.19	9453.09	-539.40	9453.09	1.52
247	20212	90.90	90.50	267.00	10796.96	9548.06	-538.98	9548.06	1.84
248	20307	89.80	90.00	266.00	10796.38	9643.05	-539.40	9643.05	1.27
249	20402	92.00	90.10	267.00	10794.88	9738.04	-539.48	9738.04	2.32
250	**20497**	**91.30**	**90.70**	**269.00**	**10792.15**	**9832.99**	**-540.14**	**9832.99**	**0.97**
Projection	20561	91.30	90.70	PTB	10790.70	9896.97	-540.92	9896.97	0.00

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)

FEB 2015
RECEIVED
ND OIL & GAS DIVISION

Well File No.
28755

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

☑ Notice of Intent — Approximate Start Date: **May 15, 2015**

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

Well Name and Number				
Kline Federal 5300 31-18 7T				
Footages	Qtr-Qtr	Section	Township	Range
2490 F S L 238 F W L	**Lot 3**	**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 submits the following physical address for above well:

13767 45th Street NW
Alexander, ND 58831

See attached McKenzie County address letter.

Company		Telephone Number
Oasis Petroleum North America LLC		**(281) 404-9652**
Address		
1001 Fannin Suite 1500		
City	State	Zip Code
Houston	**TX**	**77002**
Signature	Printed Name	
	Victoria Siemieniewski	
Title	Date	
Regulatory Specialist	**February 6, 2015**	
Email Address		
vsiemieniewski@oasispetroleum.com		

FOR STATE USE ONLY

☒ Received	☐ Approved
Date 3/16/2015	
By Matthew Messana	
Title **ENGINEERING TECHNICIAN**	

July 10, 2014

UPDATED: February 4, 2015

Proposed Address for:

Oasis Petroleum North America, LLC

Kline Federal 5300 31-18 6B, 7T, 8B & 15T Pad

Attn: Kristy Aasheim

Section: 18 Township: 153 N Range: 100 W

McKenzie County, ND

This address will be located within Alexander, ND 58831

The following address is **assuming** that the driveway or access road connects with **45th Street NW**. If this is not the case, then the address will need to be re-evaluated.

1.) Physical Address for Kline Federal 5300 31-18 6B, 7T, 8B & 15T Pad:

13767 45th Street NW
Alexander, ND 58831

Approximate Geographical Location:

103° 36' 10.401" W 48° 4' 28.178" N

Sincerely,

Aaron Chisholm

GIS Coordinator
McKenzie County, ND
701 – 444- 7417
achisholm@co.mckenzie.nd.us

Oasis Petroleum North America, LLC

Kline Federal 5300 31-18 6B, 7T, 8B & 15T Pad

Attn: Kristy Aasheim

Section: 18 Township: 153 N Range: 100 W

McKenzie County, ND

This image is meant to be used as a visual aid and is not intended to be used for geographical accuracy

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)

FEB 2015 RECEIVED ND OIL & GAS DIVISION

Well File No. 28755 ~~28756~~

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

☑ Notice of Intent	Approximate Start Date **April 17, 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 **Well Permit Changes**	

Well Name and Number					
Kline Federal 5300 31-18 7T2					
Footages	Qtr-Qtr	Section	Township	Range	
2490 F S L 238 F W L	Lot 3	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 approval to make the following changes to the original APD as follows:

Name Change: Kline Federal 5300 31-18 7T (previously 7T2)

Formation Change: Three forks first bench (previously three forks second bench)

251 NDIC Calc

BHL change: 1965' FSL & 250' FEL Sec 18 T153N R100W
(previously: 1750' FSL & 201' FEL)

Surface casing design:
Contingency Casing of 9 5/8" set at 6,402' (previously set at 6,101')
Intermediate Casing of 7" set at 11,041' (previously set at 11,084')
Production liner of 4 1/2" set from 10,243' to 20,723' (previously set from 10,286' to 20,832')

See attached supporting documents.

CC 25.00 2-20-15 KB

CC 25.00

Company **Oasis Petroleum North America LLC**		Telephone Number **(281) 404-9652**
Address **1001 Fannin Suite 1500**		
City **Houston**	State **TX**	Zip Code **77002**
Signature	Printed Name **Victoria Siemieniewski**	
Title **Regulatory Specialist**	Date **February 5, 2015**	
Email Address **vsiemieniewski@oasispetroleum.com**		

FOR STATE USE ONLY

☐ Received	☐ Approved
Date 02-18-2015	
By	
Title David Burns Engineering Tech.	

WELL LOCATION PLAT

OASIS PETROLEUM NORTH AMERICA, LLC
1001 FANNIN, SUITE 1500, HOUSTON, TX 77002
"KLINE FEDERAL 5300 31-18 7T"
2490 FEET FROM SOUTH LINE AND 238 FEET FROM WEST LINE
SECTION 18, T153N, R100W, 5th P.M., MCKENZIE COUNTY, NORTH DAKOTA

THIS DOCUMENT WAS ORIGINALLY ISSUED AND SEALED BY DARYL D. KASEMAN, PLS, REGISTRATION NUMBER 3880 ON 2/05/15 AND THE ORIGINAL DOCUMENTS ARE STORED AT THE OFFICES OF INTERSTATE ENGINEERING, INC.

0 1000
1" = 1000'

✠ - MONUMENT - RECOVERED
✠ - MONUMENT - NOT RECOVERED

STAKED ON 4/23/14
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.

DARYL D. KASEMAN LS-3880

REGISTERED LAND SURVEYOR
DARYL D. KASEMAN
LS-3880
DATE: 2/05/15
NORTH DAKOTA

VICINITY MAP

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Revision No.	Date	By	Description
REV 1	1/27/15	BRH	CHANGED WELL NAMES & BHL
REV 2	2/05/15	JAS	UPDATED ACCESS ROAD ROUTE

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

Drawn By: B.H.H. | Project No.: 214-09-109.01
Checked By: D.D.K. | Date: APR. 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

INTERSTATE ENGINEERING
Professionals you need, people you trust

SHEET NO. 1/8

DRILLING PLAN

OPERATOR	Oasis Petroleum	**COUNTY/STATE**	McKenzie Co., ND
WELL NAME	Kline Federal 5300 11-18HT	**RIG**	8
WELL TYPE	Horizontal Upper Three Forks		
LOCATION	NWSW 18- 153N- 100W; Surface Location (survey plat): 2450' NL 235' WL		
EST. T.D.	20,665	**GROUND ELEV:**	2008 Finished Pad Elev. **Sub Height:** 25
	TOTAL LATERA 9,624'	**KB ELEV:**	2033

PROGNOSIS: Based on 2,033' KB(est)

MARKER		DEPTH (Surf Loc)	DATUM (Surf Loc)
Pierre	NDIC MAP	1,923	[illegible]
Greenhorn		4,570	[illegible]
Mowry		4,976	[illegible]
Dakota		5,403	[illegible]
Rierdon		6,402	[illegible]
Dunham Salt		6,740	[illegible]
Dunham Salt Base		6,851	[illegible]
Spearfish		6,948	[illegible]
Pine Salt		7,203	[illegible]
Pine Salt Base		7,251	[illegible]
Opeche Salt		7,296	[illegible]
Opeche Salt Base		7,326	[illegible]
Broom Creek (Top of Minnelusa Gp.)		7,528	[illegible]
Amsden		7,608	[illegible]
Tyler		7,776	[illegible]
Otter (Base of Minnelusa Gp.)		7,967	[illegible]
Kibbey Lime		8,322	[illegible]
Charles Salt		8,472	[illegible]
UB		9,096	[illegible]
Base Last Salt		9,171	[illegible]
Ratcliffe		9,219	[illegible]
Mission Canyon		9,395	[illegible]
Lodgepole		9,957	[illegible]
Lodgepole Fracture Zone		10,163	[illegible]
False Bakken		10,658	[illegible]
Upper Bakken		10,668	[illegible]
Middle Bakken		10,682	[illegible]
Lower Bakken		10,727	[illegible]
Pronghorn		10,741	[illegible]
Three Forks		10,753	[illegible]
TF Target Top		10,765	[illegible]
TF Target Base		10,775	[illegible]
Claystone		10,776	[illegible]

Dip Rate: -0.2

Max. Anticipated BHP: [illegible]

LOGS:

	Type	Interval
OH Logs:	Triple Combo KOP to Kibby (or min curve at 1800' whichever is greater); GR/Res to BSC; GR to surf; CND through the Dakota	
CBL/GR:	After completion; 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: 8,272'
~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' -	2,023'	FW/Gel - Lime Sweeps	8.4-9.0	28-32	NC	Circ Mud Tanks
Intermediate:	2,023' -	11,041'	Invert	9.5-10.4	40-50	30+HtHp	Circ Mud Tanks
Lateral:	11,041' -	20,665'	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"	2,023'	To Surface	12	100' into Pierre
Inermediate (Dakota):	9-5/8"	36#	12-1/4"	6,402'	To Surface	24	Set Casing across Dakota
Intermediate:	7"	32#	8-3/4"	11,041'	4903	24	500' above Dakota
Production Liner:	4-1/2"	13.5#	6"	20,665'	[illegible]		50' above KOP

PROBABLE PLUGS, IF REQ'D:

OTHER:

	MD	TVD	FNL/FSL	FEL/FWL	S-T-R	AZI
Surface:	2,023	2,023	[illegible]	[illegible]	SEC 18-T153N-R100W	Survey Company:
KOP:	[illegible]	[illegible]	[illegible]	[illegible]	SEC 18-T153N-R100W	Build Rate: 12 deg /100'
EOC:	[illegible]	[illegible]	2275' FSL	552' FWL	SEC 18-T153N-R100W	116.90
Casing Point:	[illegible]	[illegible]	2275' FSL	[illegible] FWL	SEC 18-T153N-R100W	116.90
Threeforks Lateral TD:	[illegible]	[illegible]	[illegible]	[illegible] FWL	SEC 17-T153N-R100W	90.00

Comments:

Request a Sundry for an Open Hole Log Waiver

Exception well: Oasis Petroleum's Kline 5300 11-18H

Completion Notes: 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:** hlbader rpm 5/30/14 TR 1-29-15

Oasis Petroleum
Well Summary
Kline Federal 5300 31-18 7T
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' - 2023'	54.5	J-55	STC	12.615"	12.459"	4100	5470	6840

Interval	Description	Collapse	Burst	Tension
		(psi) / a	(psi) / b	(1000 lbs) / c
0' - 2023'	13-3/8", 54.5#, J-55, LTC, 8rd	1130 / 1.19	2730 / 1.99	514 / 2.63

API Rating & Safety Factor

a) Collapse based on full casing evacuation with 9 ppg fluid on backside (2023' setting depth).
b) Burst pressure based on 13 ppg fluid with no fluid on backside (2023' setting depth).
c) Based on string weight in 9 ppg fluid at 2023' TVD plus 100k# overpull. (Buoyed weight equals 95k lbs.)

Cement volumes are based on 13-3/8" casing set in 17-1/2 " 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: **677 sks** (350 bbls), 11.5 lb/gal, 2.97 cu. Ft./sk Varicem Cement with 0.125 il/sk Lost Circulation Additive

Tail Slurry: **300 sks** (62 bbls), 13.0 lb/gal, 2.01 cu.ft./sk Varicem with .125 lb/sk Lost Circulation Agent

Oasis Petroleum
Well Summary
Kline Federal 5300 31-18 7T
Section 18 T153N R100W
McKenzie County, ND

Contingency INTERMEDIATE CASING AND CEMENT DESIGN

							Make-up Torque (ft-lbs)		
Size	Interval	Weight	Grade	Coupling	I.D.	Drift	Minimum	Optimum	Max
9-5/8"	0' - 6402'	36	HCL-80	LTC	8.835"	8.75"	5450	7270	9090

Interval	Description	Collapse	Burst	Tension
		(psi) / a	(psi) / b	(1000 lbs) / c
0' - 6402'	9-5/8", 36#, J-55, LTC, 8rd	2020 / 2.17	3520 / 1.29	453 / 1.54

API Rating & Safety Factor

a) Collapse based on full casing evacuation with 10.4 ppg fluid on backside (6402' setting depth).

b) Burst pressure calculated from a gas kick coming from the production zone (Bakken Pool) at 9,000psi and a subsequent breakdown at the 9-5/8" shoe, based on a 15.2#/ft fracture gradient. Backup of 9 ppg fluid..

c) Tension based on string weight in 10.4 ppg fluid at 6402' TVD plus 100k# overpull. (Buoyed weight equals 194k lbs.)

Cement volumes are based on 9-5/8" casing set in 12-1/4 " hole with 10% excess to circulate cement back to surface.

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

Lead Slurry: **562 sks** (290 bbls), 2.90 ft3/sk, 11.5 lb/gal Conventional system with 94 lb/sk cement, 4% D079 extender, 2% D053 expanding agent, 2% CaCl2 and 0.250 lb/sk D130 lost circulation control agent.

Tail Slurry: **610 sks** (126 bbls), 1.16 ft3/sk 15.8 lb/gal Conventional system with 94 lb/sk cement, 0.25% CaCl2, and 0.250 lb/sk lost circulation control agent

Oasis Petroleum
Well Summary
Kline Federal 5300 31-18 7T
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' - 11041'	32	HCP-110	LTC	6.094"	6.000"**	6730	8970	9870

****Special Drift 7"32# to 6.0"**

Interval	Length	Description	Collapse	Burst	Tension
			(psi) a	(psi) b	(1000 lbs) / c
0' - 11041'	11041'	7", 32#, HCP-110, LTC, 8rd	11820 / 2.11*	12460 / 1.28	897 / 2.24
6740' - 9171'	2431'	7", 32#, HCP-110, LTC, 8rd	11820 / 1.07**	12460 / 1.30	

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 10770' TVD.

c) Based on string weight in 10 ppg fluid, (299k lbs buoyed weight) plus 100k lbs overpull.

Cement volumes are estimates based on 7" casing set in an 8-3/4" hole with 30% excess.
Mix and pump the following slurry

Pre-flush (Spacer): **100 bbls** Saltwater
20 bbls Tuned Spacer III

Lead Slurry: **176 sks** (81 bbls), 11.8 ppg, 2.55 cu. ft./sk Econocem Cement with .3% Fe-2 and .25 lb/sk Lost Circulation Additive

Tail Slurry: **587 sks** (171 bbls), 14.0 ppg, 1.55 cu. ft./sk Extendcem System with .2% HR-5 Retarder and .25 lb/sk Lost Circulation Additive

Oasis Petroleum
Well Summary
Kline Federal 5300 31-18 7T
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"	10243' - 20665'	13.5	P-110	BTC	3.920"	3.795"	2270	3020	3780

Interval	Length	Desctiption	Collapse	Burst	Tension
			(psi) a	(psi) b	(1000 lbs) c
10243' - 20665'	10422	4-1/2", 13.5 lb, P-110, BTC	10670 / 1.99	12410 / 1.28	443 / 2.01

API Rating & Safety Factor

a) Based on full casing evacuation with 9.5 ppg fluid on backside @ 10804' TVD.

b) Burst pressure based on 9000 psi treating pressure with 10.2 ppg internal fluid gradient and 9 ppg external fluid gradient @ 10804' TVD.

c) Based on string weight in 9.5 ppg fluid (Buoyed weight: 120k lbs.) plus 100k lbs overpull.

Project: Indian Hills
Site: 153N-100W-17/18
Well: Kline Federal 5300 31-18 7T
Wellbore: Kline Federal 5300 31-18 7T
Design: Design #2

OASIS PETROLEUM

WELL DETAILS: Kline Federal 5300 31-18 7T

Ground Level: 2008.0

Northing	Easting	Latittude	Longitude
407189.33	1210089.73	48° 4' 27.840 N	103° 36' 11.380 W

Azimuths to True North
Magnetic North: 8.40°

Magnetic Field
Strength: 56363.2snT
Dip Angle: 72.98°
Date: 5/28/2014
Model: IGRF2015

CASING DETAILS

TVD	MD	Name	Size
2023.0	2023.0	13 3/8"	13.375
6402.0	6402.0	9 5/8"	9.625
10770.0	11040.8	7"	7.000

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	
10292.5	0.00	0.00	10292.5	0.0	0.0	0.00	
11040.8	89.80	116.90	10770.0	-215.3	424.3	12.00	
12385.9	89.80	90.00	10774.8	-525.2	1720.5	2.00	
20665.4	89.80	90.00	10804.0	-525.0	10000.0	0.00	KLINE FEDERAL 5300 31-18 7T - PBHL

Oasis

Indian Hills
153N-100W-17/18
Kline Federal 5300 31-18 7T
Kline Federal 5300 31-18 7T
Kline Federal 5300 31-18 7T

Plan: Design #2

Standard Planning Report

17 February, 2015

Database:	OpenWellsCompass - EDM Prod	**Local Co-ordinate Reference:**	Well Kline Federal 5300 31-18 7T
Company:	Oasis	**TVD Reference:**	WELL @ 2033.0usft (Original Well Elev)
Project:	Indian Hills	**MD Reference:**	WELL @ 2033.0usft (Original Well Elev)
Site:	153N-100W-17/18	**North Reference:**	True
Well:	Kline Federal 5300 31-18 7T	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Kline Federal 5300 31-18 7T		
Design:	Design #2		

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:**	407,189.34 usft	**Latitude:**	48° 4' 27.840 N
From:	Lat/Long	**Easting:**	1,210,089.73 usft	**Longitude:**	103° 36' 11.380 W
Position Uncertainty:	0.0 usft	**Slot Radius:**	13.200 in	**Grid Convergence:**	-2.31 °

Well Kline Federal 5300 31-18 7T

Well Position	**+N/-S**	0.0 usft	**Northing:**	407,189.33 usft	**Latitude:**	48° 4' 27.840 N
	+E/-W	0.0 usft	**Easting:**	1,210,089.73 usft	**Longitude:**	103° 36' 11.380 W
Position Uncertainty		2.0 usft	**Wellhead Elevation:**		**Ground Level:**	2,008.0 usft

Wellbore Kline Federal 5300 31-18 7T

Magnetics	**Model Name**	**Sample Date**	**Declination (°)**	**Dip Angle (°)**	**Field Strength (nT)**
	IGRF2015	5/28/2014	8.40	72.98	56,363

Design Design #2

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 (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	TFO (°)	Target
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	
10,292.5	0.00	0.00	10,292.5	0.0	0.0	0.00	0.00	0.00	0.00	
11,040.8	89.80	116.90	10,770.0	-215.3	424.3	12.00	12.00	0.00	116.90	
12,385.9	89.80	90.00	10,774.8	-525.2	1,720.5	2.00	0.00	-2.00	-90.05	
20,665.4	89.80	90.00	10,804.0	-525.0	10,000.0	0.00	0.00	0.00	0.00	5300 31-18 7T - PBHI

Database:	OpenWellsCompass - EDM Prod	**Local Co-ordinate Reference:**	Well Kline Federal 5300 31-18 7T
Company:	Oasis	**TVD Reference:**	WELL @ 2033.0usft (Original Well Elev)
Project:	Indian Hills	**MD Reference:**	WELL @ 2033.0usft (Original Well Elev)
Site:	153N-100W-17/18	**North Reference:**	True
Well:	Kline Federal 5300 31-16 7T	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Kline Federal 5300 31-18 7T		
Design:	Design #2		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
10,292.5	0.00	0.00	10,292.5	0.0	0.0	0.0	0.00	0.00	0.00
Start Build 12.00									
10,300.0	0.90	116.90	10,300.0	0.0	0.1	0.1	12.00	12.00	0.00
10,400.0	12.90	116.90	10,399.1	-5.5	10.7	10.7	12.00	12.00	0.00
10,500.0	24.90	116.90	10,493.5	-20.1	39.6	39.6	12.00	12.00	0.00
10,600.0	36.90	116.90	10,579.2	-43.3	85.3	85.3	12.00	12.00	0.00
10,700.0	48.90	116.90	10,652.3	-74.0	145.9	145.9	12.00	12.00	0.00
10,800.0	60.90	116.90	10,709.7	-111.0	218.7	218.7	12.00	12.00	0.00
10,900.0	72.90	116.90	10,748.9	-152.5	300.6	300.6	12.00	12.00	0.00
11,000.0	84.90	116.90	10,768.1	-196.8	388.0	388.0	12.00	12.00	0.00
11,040.8	89.80	116.90	10,770.0	-215.3	424.3	424.3	12.00	12.00	0.00
Start DLS 2.00 TFO -90.05 - 7"									
11,100.0	89.80	115.72	10,770.2	-241.5	477.4	477.4	2.00	0.00	-2.00
11,200.0	89.80	113.72	10,770.5	-283.3	568.2	568.2	2.00	0.00	-2.00
11,300.0	89.80	111.72	10,770.9	-321.9	660.4	660.4	2.00	0.00	-2.00
11,400.0	89.79	109.72	10,771.2	-357.3	754.0	754.0	2.00	0.00	-2.00
11,500.0	89.79	107.72	10,771.6	-389.4	848.7	848.7	2.00	0.00	-2.00
11,600.0	89.79	105.72	10,772.0	-418.1	944.4	944.4	2.00	0.00	-2.00
11,700.0	89.79	103.72	10,772.3	-443.5	1,041.1	1,041.1	2.00	0.00	-2.00
11,800.0	89.79	101.72	10,772.7	-465.6	1,138.7	1,138.7	2.00	0.00	-2.00
11,900.0	89.79	99.72	10,773.0	-484.1	1,236.9	1,236.9	2.00	0.00	-2.00
12,000.0	89.79	97.72	10,773.4	-499.3	1,335.8	1,335.8	2.00	0.00	-2.00
12,100.0	89.79	95.72	10,773.8	-511.0	1,435.1	1,435.1	2.00	0.00	-2.00
12,200.0	89.80	93.72	10,774.1	-519.2	1,534.7	1,534.7	2.00	0.00	-2.00
12,300.0	89.80	91.72	10,774.5	-524.0	1,634.6	1,634.6	2.00	0.00	-2.00
12,385.9	89.80	90.00	10,774.8	-525.2	1,720.5	1,720.5	2.00	0.00	-2.00
Start 8279.5 hold at 12385.9 MD									
12,400.0	89.80	90.00	10,774.8	-525.2	1,734.6	1,734.6	0.00	0.00	0.00
12,500.0	89.80	90.00	10,775.2	-525.2	1,834.6	1,834.6	0.00	0.00	0.00
12,600.0	89.80	90.00	10,775.5	-525.2	1,934.6	1,934.6	0.00	0.00	0.00
12,700.0	89.80	90.00	10,775.9	-525.2	2,034.6	2,034.6	0.00	0.00	0.00
12,800.0	89.80	90.00	10,776.2	-525.2	2,134.6	2,134.6	0.00	0.00	0.00
12,900.0	89.80	90.00	10,776.6	-525.2	2,234.6	2,234.6	0.00	0.00	0.00
13,000.0	89.80	90.00	10,776.9	-525.2	2,334.6	2,334.6	0.00	0.00	0.00
13,100.0	89.80	90.00	10,777.3	-525.2	2,434.6	2,434.6	0.00	0.00	0.00
13,200.0	89.80	90.00	10,777.6	-525.2	2,534.6	2,534.6	0.00	0.00	0.00
13,300.0	89.80	90.00	10,778.0	-525.2	2,634.6	2,634.6	0.00	0.00	0.00
13,400.0	89.80	90.00	10,778.4	-525.2	2,734.6	2,734.6	0.00	0.00	0.00
13,500.0	89.80	90.00	10,778.7	-525.2	2,834.6	2,834.6	0.00	0.00	0.00
13,600.0	89.80	90.00	10,779.1	-525.2	2,934.6	2,934.6	0.00	0.00	0.00
13,700.0	89.80	90.00	10,779.4	-525.2	3,034.6	3,034.6	0.00	0.00	0.00
13,800.0	89.80	90.00	10,779.8	-525.2	3,134.6	3,134.6	0.00	0.00	0.00
13,900.0	89.80	90.00	10,780.1	-525.2	3,234.6	3,234.6	0.00	0.00	0.00
14,000.0	89.80	90.00	10,780.5	-525.2	3,334.6	3,334.6	0.00	0.00	0.00
14,100.0	89.80	90.00	10,780.8	-525.2	3,434.6	3,434.6	0.00	0.00	0.00
14,200.0	89.80	90.00	10,781.2	-525.2	3,534.6	3,534.6	0.00	0.00	0.00
14,300.0	89.80	90.00	10,781.5	-525.2	3,634.6	3,634.6	0.00	0.00	0.00
14,400.0	89.80	90.00	10,781.9	-525.2	3,734.6	3,734.6	0.00	0.00	0.00
14,500.0	89.80	90.00	10,782.2	-525.2	3,834.6	3,834.6	0.00	0.00	0.00
14,600.0	89.80	90.00	10,782.6	-525.2	3,934.6	3,934.6	0.00	0.00	0.00
14,700.0	89.80	90.00	10,782.9	-525.2	4,034.6	4,034.6	0.00	0.00	0.00
14,800.0	89.80	90.00	10,783.3	-525.2	4,134.6	4,134.6	0.00	0.00	0.00
14,900.0	89.80	90.00	10,783.6	-525.2	4,234.6	4,234.6	0.00	0.00	0.00
15,000.0	89.80	90.00	10,784.0	-525.2	4,334.6	4,334.6	0.00	0.00	0.00
15,100.0	89.80	90.00	10,784.4	-525.2	4,434.6	4,434.6	0.00	0.00	0.00

Database:	OpenWellsCompass - EDM Prod	**Local Co-ordinate Reference:**	Well Kline Federal 5300 31-18 7T
Company:	Oasis	**TVD Reference:**	WELL @ 2033.0usft (Original Well Elev)
Project:	Indian Hills	**MD Reference:**	WELL @ 2033.0usft (Original Well Elev)
Site:	153N-100W-17/18	**North Reference:**	True
Well:	Kline Federal 5300 31-18 7T	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Kline Federal 5300 31-18 7T		
Design:	Design #2		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
15,200.0	89.80	90.00	10,784.7	-525.2	4,534.6	4,534.6	0.00	0.00	0.00
15,300.0	89.80	90.00	10,785.1	-525.2	4,634.6	4,634.6	0.00	0.00	0.00
15,400.0	89.80	90.00	10,785.4	-525.2	4,734.6	4,734.6	0.00	0.00	0.00
15,500.0	89.80	90.00	10,785.8	-525.1	4,834.6	4,834.6	0.00	0.00	0.00
15,600.0	89.80	90.00	10,786.1	-525.1	4,934.6	4,934.6	0.00	0.00	0.00
15,700.0	89.80	90.00	10,786.5	-525.1	5,034.6	5,034.6	0.00	0.00	0.00
15,800.0	89.80	90.00	10,786.8	-525.1	5,134.6	5,134.6	0.00	0.00	0.00
15,900.0	89.80	90.00	10,787.2	-525.1	5,234.6	5,234.6	0.00	0.00	0.00
16,000.0	89.80	90.00	10,787.5	-525.1	5,334.6	5,334.6	0.00	0.00	0.00
16,100.0	89.80	90.00	10,787.9	-525.1	5,434.6	5,434.6	0.00	0.00	0.00
16,200.0	89.80	90.00	10,788.2	-525.1	5,534.6	5,534.6	0.00	0.00	0.00
16,300.0	89.80	90.00	10,788.6	-525.1	5,634.6	5,634.6	0.00	0.00	0.00
16,400.0	89.80	90.00	10,788.9	-525.1	5,734.6	5,734.6	0.00	0.00	0.00
16,500.0	89.80	90.00	10,789.3	-525.1	5,834.6	5,834.6	0.00	0.00	0.00
16,600.0	89.80	90.00	10,789.6	-525.1	5,934.6	5,934.6	0.00	0.00	0.00
16,700.0	89.80	90.00	10,790.0	-525.1	6,034.6	6,034.6	0.00	0.00	0.00
16,800.0	89.80	90.00	10,790.4	-525.1	6,134.6	6,134.6	0.00	0.00	0.00
16,900.0	89.80	90.00	10,790.7	-525.1	6,234.6	8,234.6	0.00	0.00	0.00
17,000.0	89.80	90.00	10,791.1	-525.1	6,334.8	6,334.6	0.00	0.00	0.00
17,100.0	89.80	90.00	10,791.4	-525.1	6,434.6	6,434.6	0.00	0.00	0.00
17,200.0	89.80	90.00	10,791.8	-525.1	6,534.6	6,534.6	0.00	0.00	0.00
17,300.0	89.80	90.00	10,792.1	-525.1	6,634.6	6,634.6	0.00	0.00	0.00
17,400.0	89.80	90.00	10,792.5	-525.1	6,734.6	6,734.6	0.00	0.00	0.00
17,500.0	89.80	90.00	10,792.8	-525.1	6,834.6	6,834.6	0.00	0.00	0.00
17,800.0	89.80	90.00	10,793.2	-525.1	6,934.6	6,934.6	0.00	0.00	0.00
17,700.0	89.80	90.00	10,793.5	-525.1	7,034.6	7,034.6	0.00	0.00	0.00
17,800.0	89.80	90.00	10,793.9	-525.1	7,134.6	7,134.6	0.00	0.00	0.00
17,900.0	89.80	90.00	10,794.2	-525.1	7,234.6	7,234.6	0.00	0.00	0.00
18,000.0	89.80	90.00	10,794.6	-525.1	7,334.6	7,334.6	0.00	0.00	0.00
18,100.0	89.80	90.00	10,794.9	-525.1	7,434.6	7,434.6	0.00	0.00	0.00
18,200.0	89.80	90.00	10,795.3	-525.1	7,534.6	7,534.6	0.00	0.00	0.00
18,300.0	89.80	90.00	10,795.6	-525.1	7,634.6	7,634.6	0.00	0.00	0.00
18,400.0	89.80	90.00	10,796.0	-525.1	7,734.6	7,734.6	0.00	0.00	0.00
18,500.0	89.80	90.00	10,796.4	-525.1	7,834.6	7,834.6	0.00	0.00	0.00
18,800.0	89.80	90.00	10,796.7	-525.1	7,934.6	7,934.6	0.00	0.00	0.00
18,700.0	89.80	90.00	10,797.1	-525.1	8,034.6	8,034.6	0.00	0.00	0.00
18,800.0	89.80	90.00	10,797.4	-525.1	8,134.6	8,134.6	0.00	0.00	0.00
18,900.0	89.80	90.00	10,797.8	-525.0	8,234.6	8,234.6	0.00	0.00	0.00
19,000.0	89.80	90.00	10,798.1	-525.0	8,334.6	8,334.6	0.00	0.00	0.00
19,100.0	89.80	90.00	10,798.5	-525.0	8,434.6	8,434.6	0.00	0.00	0.00
19,200.0	89.80	90.00	10,798.8	-525.0	8,534.6	8,534.6	0.00	0.00	0.00
19,300.0	89.80	90.00	10,799.2	-525.0	8,634.6	8,634.6	0.00	0.00	0.00
19,400.0	89.80	90.00	10,799.5	-525.0	8,734.6	8,734.6	0.00	0.00	0.00
19,500.0	89.80	90.00	10,799.9	-525.0	8,834.8	8,834.6	0.00	0.00	0.00
19,600.0	89.80	90.00	10,800.2	-525.0	8,934.6	8,934.6	0.00	0.00	0.00
19,700.0	89.80	90.00	10,800.6	-525.0	9,034.6	9,034.6	0.00	0.00	0.00
19,800.0	89.80	90.00	10,800.9	-525.0	9,134.6	9,134.6	0.00	0.00	0.00
19,900.0	89.80	90.00	10,801.3	-525.0	9,234.6	9,234.6	0.00	0.00	0.00
20,000.0	89.80	90.00	10,801.7	-525.0	9,334.6	9,334.6	0.00	0.00	0.00
20,100.0	89.80	90.00	10,802.0	-525.0	9,434.6	9,434.6	0.00	0.00	0.00
20,200.0	89.80	90.00	10,802.4	-525.0	9,534.6	9,534.6	0.00	0.00	0.00
20,300.0	89.80	90.00	10,802.7	-525.0	9,634.6	9,634.6	0.00	0.00	0.00
20,400.0	89.80	90.00	10,803.1	-525.0	9,734.6	9,734.6	0.00	0.00	0.00
20,500.0	89.80	90.00	10,803.4	-525.0	9,834.6	9,834.6	0.00	0.00	0.00
20,600.0	89.80	90.00	10,803.8	-525.0	9,934.6	9,934.6	0.00	0.00	0.00

Database:	OpenWellsCompass - EDM Prod	**Local Co-ordinate Reference:**	Well Kline Federal 5300 31-18 7T
Company:	Oasis	**TVD Reference:**	WELL @ 2033.0usft (Original Well Elev)
Project:	Indian Hills	**MD Reference:**	WELL @ 2033.0usft (Original Well Elev)
Site:	153N-100W-17/18	**North Reference:**	True
Well:	Kline Federal 5300 31-18 7T	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Kline Federal 5300 31-18 7T		
Design:	Design #2		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
20,665.4	89.80	90.00	10,804.0	-525.0	10,000.0	10,000.0	0.00	0.00	0.00
TD at 20665.4 - 5300 31-18 7T - 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 31-18 7T - PBHL - plan hits target center - Point	0.00	0.00	10,804.0	-525.0	10,000.0	406,261.84	1,220,060.45	48° 4' 22.632 N	103° 33' 44.124 W

Casing Points

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (in)	Hole Diameter (in)
2,023.0	2,023.0	13 3/8"	13.375	17.500
6,402.0	6,402.0	9 5/8"	9.625	12.250
11,040.8	10,770.0	7"	7.000	8.750

Database:	OpenWellsCompass - EDM Prod	**Local Co-ordinate Reference:**	Well Kline Federal 5300 31-18 7T
Company:	Oasis	**TVD Reference:**	WELL @ 2033.0usft (Original Well Elev)
Project:	Indian Hills	**MD Reference:**	WELL @ 2033.0usft (Original Well Elev)
Site:	153N-100W-17/18	**North Reference:**	True
Well:	Kline Federal 5300 31-18 7T	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Kline Federal 5300 31-18 7T		
Design:	Design #2		

Formations

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
1,923.0	1,923.0	Pierre			
4,570.0	4,570.0	Greenhorn			
4,976.0	4,976.0	Mowry			
5,403.0	5,403.0	Dakota			
6,402.0	6,402.0	Rierdon			
6,740.0	6,740.0	Dunham Salt			
6,851.0	6,851.0	Dunham Salt Base			
6,948.0	6,948.0	Spearfish			
7,203.0	7,203.0	Pine Salt			
7,251.0	7,251.0	Pine Salt Base			
7,296.0	7,296.0	Opeche Salt			
7,326.0	7,326.0	Opeche Salt Base			
7,528.0	7,528.0	Broom Creek (Top of Minnelusa Gp.)			
7,608.0	7,608.0	Amsden			
7,776.0	7,776.0	Tyler			
7,967.0	7,967.0	Otter (Base of Minnelusa Gp.)			
8,322.0	8,322.0	Kibbey Lime			
8,472.0	8,472.0	Charles Salt			
9,096.0	9,096.0	UB			
9,171.0	9,171.0	Base Last Salt			
9,219.0	9,219.0	Ratcliffe			
9,395.0	9,395.0	Mission Canyon			
9,957.0	9,957.0	Lodgepole			
10,163.0	10,163.0	Lodgepole Fracture Zone			
10,708.8	10,658.0	False Bakken			
10,724.6	10,668.0	Upper Bakken			
10,748.0	10,682.0	Middle Bakken			
10,838.4	10,727.0	Lower Bakken			
10,875.3	10,741.0	Pronghorn			
10,914.8	10,753.0	Three Forks			
10,973.6	10,765.0	TF Target Top			
12,450.6	10,775.0	TF Target Base			
12,733.9	10,776.0	Claystone			

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	Local Coordinates +E/-W (usft)	Comment
10,292.5	10,292.5	0.0	0.0	Start Build 12.00
11,040.8	10,770.0	-215.3	424.3	Start DLS 2.00 TFO -90.05
12,385.9	10,774.8	-525.2	1,720.5	Start 8279.5 hold at 12385.9 MD
20,665.4	10,804.0	-525.0	10,000.0	TD at 20665.4

SECTION BREAKDOWN

OASIS PETROLEUM NORTH AMERICA, LLC
1001 FANNIN, SUITE 1500, HOUSTON, TX 77002
"KLINE FEDERAL 5300 31-18 7T"
2490 FEET FROM SOUTH LINE AND 238 FEET FROM WEST LINE
SECTIONS 17 & 18, T153N, R100W, 5th P.M., MCKENZIE COUNTY, NORTH DAKOTA

- MONUMENT – RECOVERED
- MONUMENT – NOT RECOVERED

THIS DOCUMENT WAS ORIGINALLY ISSUED AND SEALED BY DARYL D. KASEMAN, PLS, REGISTRATION NUMBER 3880 ON 2/05/15 AND THE ORIGINAL DOCUMENTS ARE STORED AT THE OFFICES OF INTERSTATE ENGINEERING, INC.

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'.

REGISTERED LAND SURVEYOR
DARYL D. KASEMAN
LS-3880
DATE: 2/05/15
NORTH DAKOTA

VICINITY MAP

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Revision No.	Date	By	Description
REV 1	1/27/15	BHK	CHANGED WELL PAD SIZE & SHAPE
REV 2	2/05/15	JAS	UPDATED ACCESS ROAD ROUTE

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

Drawn By: BJ/JVL | Project No.: S14-08-199.01
Checked By: DDK | Date: APRIL 2014

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Other offices in Minnesota, North Dakota and South Dakota

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EXISTING CONTOURS

OASIS PETROLEUM NORTH AMERICA, LLC
1001 FANNIN, SUITE 1500, HOUSTON, TX 77002
"KLINE FEDERAL 5300 31-18 15T" 4 well Pad
2556 FEET FROM SOUTH LINE AND 238 FEET FROM WEST LINE
SECTION 18, T153N, R100W, 5TH P.M., MCKENZIE COUNTY, NORTH DAKOTA

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

V-DITCH DETAIL

Proposed Contours
Original Contours
BERM
DITCH

0 80
1" = 80'

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

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OASIS PETROLEUM NORTH AMERICA, LLC
EXISTING CONTOURS
SECTION 18, T153N, R100W
MCKENZIE COUNTY, NORTH DAKOTA

Drawn By: B.H.H. | Project No.: S14-09-108.05
Checked By: D.D.K. | Date: JAN. 2015

Revision No.	Date	By	Description
REV 1	2/2/15	BHH	UPDATED ACCESS

ACCESS APPROACH

OASIS PETROLEUM NORTH AMERICA, LLC
1001 FANNIN, SUITE 1500, HOUSTON, TX 77002
"KLINE FEDERAL 5300 31-18 7T"
2490 FEET FROM SOUTH LINE AND 238 FEET FROM WEST LINE
SECTION 18, T153N, R100W, 5th P.M., MCKENZIE COUNTY, NORTH DAKOTA

REGISTERED LAND SURVEYOR
DARYL D. KASEMAN
LS-3880
DATE: 2/05/15
NORTH DAKOTA

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

0 500
1" = 500'

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

Drawn By: B.H.H. | Project No.: S14-08-108.01
Checked By: D.D.K. | Date: APRIL 2014

Revision No.	Date	By	Description
REV 1	1/27/15	BHH	CHANGED WELL NAMES & SHL
REV 2	2/05/15	JJS	UPDATED ACCESS ROAD ROUTE

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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.: S14-09-109.01
Checked By: D.D.K. | Date: APRIL 2014

Revision No.	Date	By	Description
REV 1	1/27/15	BHH	CHANGED WELL NAMES & BHL
REV 2	2/05/15	JJS	UPDATED ACCESS ROAD ROUTE

COUNTY ROAD MAP

OASIS PETROLEUM NORTH AMERICA, LLC
1001 FANNIN, SUITE 1500, HOUSTON, TX 77002
"KLINE FEDERAL 5300 31-18 7T"
2490 FEET FROM SOUTH LINE AND 238 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.: S14-09-109.01
Checked By: D.D.K. | Date: APRIL 2014

Revision No.	Date	By	Description
REV 1	1/27/15	BHH	CHANGED WELL NAMES & BHL
REV 2	2/05/15	JJS	UPDATED ACCESS ROAD ROUTE

CROSS SECTIONS

OASIS PETROLEUM NORTH AMERICA, LLC
1001 FANNIN, SUITE 1500, HOUSTON, TX 77002
"KLINE FEDERAL 5300 31-18 7T"
2490 FEET FROM SOUTH LINE AND 238 FEET FROM WEST LINE
SECTION 18, T153N, R100W, 5th P.M., MCKENZIE COUNTY, NORTH DAKOTA

REGISTERED LAND SURVEYOR
DARYL D. KASEMAN
LS-3880
DATE: 2/05/15
NORTH DAKOTA

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SCALE
HORIZ 1"=160'
VERT 1"=40'

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OASIS PETROLEUM NORTH AMERICA, LLC
CROSS SECTIONS
SECTION 18, T153N, R100W
MKENZIE COUNTY, NORTH DAKOTA

Drawn By: B.H.H. | Project No.: S14-09-109.01
Checked By: D.D.K. | Date: APRIL 2014

Revision No.	Date	By	Description
REV 1	1/27/15	BHH	CHANGED WELL NAMES & SHL
REV 2	2/05/15	JJS	UPDATED ACCESS ROAD ROUTE

WELL LOCATION SITE QUANTITIES

OASIS PETROLEUM NORTH AMERICA, LLC
1001 FANNIN, SUITE 1500, HOUSTON, TX 77002
"KLINE FEDERAL 5300 31-18 7T"
2490 FEET FROM SOUTH LINE AND 238 FEET FROM WEST LINE
SECTION 18, T153N, R100W, 5th P.M., MCKENZIE COUNTY, NORTH DAKOTA

WELL SITE ELEVATION	2018.2
WELL PAD ELEVATION	2008.0

EXCAVATION	146,179
PLUS PIT	0
	146,179
EMBANKMENT	113,287
PLUS SHRINKAGE (25%)	28,322
	141,609
STOCKPILE PIT	0
STOCKPILE TOP SOIL (6")	4,701
BERMS	1,076 LF = 349 CY
DITCHES	1,350 LF = 207 CY
CONTAINMENT AREA	1,238 CY
STOCKPILE MATERIAL	965
DISTURBED AREA FROM PAD	5.83 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
2490' FSL
238' FWL

BERM DETAIL

DIVERSION DITCH DETAIL

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

Drawn By: B.H.H. Project No.: S14-09-109.01
Checked By: D.D.K. Date: APRIL 2014

Revision No.	Date	By	Description
REV 1	1/27/15	BHH	CHANGED WELL NAMES & BHL
REV 2	2/05/15	JJS	UPDATED ACCESS ROAD ROUTE

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. **28755**

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 31-18 7T2					
Footages	Qtr-Qtr	Section	Township	Range	
2490 F S L 238 F W L	**LOT3**	**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, 2,023' 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	

Oasis

Indian Hills
153N-100W-17/18
Kline Federal 5300 31-18 7T2

Kline Federal 5300 31-18 7T2
Design #1

Anticollision Report

18 July, 2014

Anticollision Report

Company:	Oasis	**Local Co-ordinate Reference:**	Well Kline Federal 5300 31-18 7T2
Project:	Indian Hills	**TVD Reference:**	WELL @ 2033.0usft (Original Well Elev)
Reference Site:	153N-100W-17/18	**MD Reference:**	WELL @ 2033.0usft (Original Well Elev)
Site Error:	0.0 usft	**North Reference:**	True
Reference Well:	Kline Federal 5300 31-18 7T2	**Survey Calculation Method:**	Minimum Curvature
Well Error:	2.0 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	Kline Federal 5300 31-18 7T2	**Database:**	EDM_new
Reference Design:	Design #1	**Offset TVD Reference:**	Offset Datum

Reference Design #1

Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
Interpolation Method:	Stations	**Error Model:**	ISCWSA
Depth Range:	Unlimited	**Scan Method:**	Closest Approach 3D
Results Limited by:	Maximum center-center distance of 10,000.0 us	**Error Surface:**	Elliptical Conic
Warning Levels Evaluated at:	2.00 **Sigma**	**Casing Method:**	Not applied

Survey Tool Program Date 7/18/2014

From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
0.0	20,831.6	Design #1 (Kline Federal 5300 31-18 7T2)	MWD	MWD - Standard

Summary

Site Name Offset Well - Wellbore - Design	Reference Measured Depth (usft)	Offset Measured Depth (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Separation Factor	Warning
153N-100W-17/18						
Kline Federal 5300 31-18 6B - Kline Federal 5300 31-18	2,200.0	2,200.0	33.4	23.0	3.213	CC
Kline Federal 5300 31-18 6B - Kline Federal 5300 31-18	20,831.6	20,694.5	124.1	-26.5	0.824	Level 1, ES, SF
Kline Federal 5300 31-18 8T - Kline Federal 5300 31-18	2,200.0	2,200.0	32.4	22.0	3.115	CC
Kline Federal 5300 31-18 8T - Kline Federal 5300 31-18	20,831.6	20,656.4	500.8	-85.3	0.854	Level 1, ES, SF

Offset Design 153N-100W-17/18 - Kline Federal 5300 31-18 6B - Kline Federal 5300 31-18 6B - Design #1 — Offset Site Error: 0.0 usft

Survey Program: 0-MWD — Offset Well Error: 2.0 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
0.0	0.0	0.0	0.0	2.0	2.0	180.00	-33.4	0.0	33.4				
100.0	100.0	100.0	100.0	2.0	2.0	180.00	-33.4	0.0	33.4	29.4	4.00	8.353	
200.0	200.0	200.0	200.0	2.0	2.0	180.00	-33.4	0.0	33.4	29.4	4.05	8.262	
300.0	300.0	300.0	300.0	2.1	2.1	180.00	-33.4	0.0	33.4	29.3	4.14	8.077	
400.0	400.0	400.0	400.0	2.1	2.1	180.00	-33.4	0.0	33.4	29.2	4.28	7.817	
500.0	500.0	500.0	500.0	2.2	2.2	180.00	-33.4	0.0	33.4	29.0	4.46	7.502	
600.0	600.0	600.0	600.0	2.3	2.3	180.00	-33.4	0.0	33.4	28.8	4.67	7.156	
700.0	700.0	700.0	700.0	2.5	2.5	180.00	-33.4	0.0	33.4	28.5	4.92	6.796	
800.0	800.0	800.0	800.0	2.6	2.6	180.00	-33.4	0.0	33.4	28.2	5.20	6.437	
900.0	900.0	900.0	900.0	2.7	2.7	180.00	-33.4	0.0	33.4	27.9	5.49	6.088	
1,000.0	1,000.0	1,000.0	1,000.0	2.9	2.9	180.00	-33.4	0.0	33.4	27.6	5.81	5.755	
1,100.0	1,100.0	1,100.0	1,100.0	3.1	3.1	180.00	-33.4	0.0	33.4	27.3	6.14	5.442	
1,200.0	1,200.0	1,200.0	1,200.0	3.2	3.2	180.00	-33.4	0.0	33.4	26.9	6.49	5.151	
1,300.0	1,300.0	1,300.0	1,300.0	3.4	3.4	180.00	-33.4	0.0	33.4	26.6	6.85	4.880	
1,400.0	1,400.0	1,400.0	1,400.0	3.6	3.6	180.00	-33.4	0.0	33.4	26.2	7.22	4.631	
1,500.0	1,500.0	1,500.0	1,500.0	3.8	3.8	180.00	-33.4	0.0	33.4	25.8	7.60	4.400	
1,600.0	1,600.0	1,600.0	1,600.0	4.0	4.0	180.00	-33.4	0.0	33.4	25.5	7.99	4.188	
1,700.0	1,700.0	1,700.0	1,700.0	4.2	4.2	180.00	-33.4	0.0	33.4	25.1	8.38	3.992	
1,800.0	1,800.0	1,800.0	1,800.0	4.4	4.4	180.00	-33.4	0.0	33.4	24.7	8.78	3.811	
1,900.0	1,900.0	1,900.0	1,900.0	4.6	4.6	180.00	-33.4	0.0	33.4	24.3	9.18	3.644	
2,000.0	2,000.0	2,000.0	2,000.0	4.8	4.8	180.00	-33.4	0.0	33.4	23.9	9.58	3.489	
2,100.0	2,100.0	2,100.0	2,100.0	5.0	5.0	180.00	-33.4	0.0	33.4	23.4	9.99	3.346	
2,200.0	2,200.0	2,200.0	2,200.0	5.2	5.2	180.00	-33.4	0.0	33.4	23.0	10.41	3.213	CC

CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation

Company:	Oasis	Local Co-ordinate Reference:	Well Kline Federal 5300 31-18 7T2
Project:	Indian Hills	TVD Reference:	WELL @ 2033.0usft (Original Well Elev)
Reference Site:	153N-100W-17/18	MD Reference:	WELL @ 2033.0usft (Original Well Elev)
Site Error:	0.0 usft	North Reference:	True
Reference Well:	Kline Federal 5300 31-18 7T2	Survey Calculation Method:	Minimum Curvature
Well Error:	2.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Kline Federal 5300 31-18 7T2	Database:	EDM_new
Reference Design:	Design #1	Offset TVD Reference:	Offset Datum

Offset Design 153N-100W-17/18 - Kline Federal 5300 31-18 6B - Kline Federal 5300 31-18 6B - Design #1

Survey Program: 0-MWD

Offset Site Error: 0.0 usft
Offset Well Error: 2.0 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
2,300.0	2,300.0	2,299.7	2,299.7	5.4	5.4	180.00	-34.2	0.0	34.2	23.5	10.78	3.178	
2,400.0	2,400.0	2,399.7	2,399.7	5.6	5.5	180.00	-35.1	0.0	35.1	24.0	11.14	3.151	
2,500.0	2,500.0	2,499.7	2,499.7	5.8	5.7	180.00	-36.0	0.0	36.0	24.5	11.52	3.124	
2,600.0	2,600.0	2,599.7	2,599.7	6.0	5.9	180.00	-36.9	0.0	36.9	25.0	11.90	3.098	
2,700.0	2,700.0	2,699.7	2,699.7	6.3	6.0	180.00	-37.7	0.0	37.7	25.4	12.28	3.072	
2,800.0	2,800.0	2,799.7	2,799.7	6.5	6.2	180.00	-38.6	0.0	38.6	25.9	12.67	3.046	
2,900.0	2,900.0	2,899.7	2,899.7	6.7	6.4	180.00	-39.5	0.0	39.5	26.4	13.06	3.022	
3,000.0	3,000.0	2,999.7	2,999.6	6.9	6.6	180.00	-40.3	0.0	40.3	26.9	13.46	2.998	
3,100.0	3,100.0	3,099.7	3,099.6	7.1	6.7	180.00	-41.2	0.0	41.2	27.4	13.86	2.974	
3,200.0	3,200.0	3,199.7	3,199.6	7.3	6.9	180.00	-42.1	0.0	42.1	27.8	14.26	2.951	
3,300.0	3,300.0	3,299.7	3,299.6	7.5	7.1	180.00	-43.0	0.0	43.0	28.3	14.67	2.929	
3,400.0	3,400.0	3,399.7	3,399.6	7.8	7.3	180.00	-43.8	0.0	43.8	28.8	15.08	2.908	
3,500.0	3,500.0	3,499.7	3,499.6	8.0	7.5	180.00	-44.7	0.0	44.7	29.2	15.49	2.887	
3,600.0	3,600.0	3,599.7	3,599.6	8.2	7.7	180.00	-45.6	0.0	45.6	29.7	15.90	2.867	
3,700.0	3,700.0	3,699.7	3,699.6	8.4	7.9	180.00	-46.5	0.0	46.5	30.1	16.31	2.848	
3,800.0	3,800.0	3,799.6	3,799.6	8.6	8.1	180.00	-47.3	0.0	47.3	30.6	16.73	2.829	
3,900.0	3,900.0	3,899.6	3,899.6	8.9	8.3	180.00	-48.2	0.0	48.2	31.1	17.15	2.811	
4,000.0	4,000.0	3,999.6	3,999.6	9.1	8.5	180.00	-49.1	0.0	49.1	31.5	17.57	2.794	
4,100.0	4,100.0	4,099.6	4,099.6	9.3	8.7	180.00	-49.9	0.0	49.9	32.0	17.99	2.777	
4,200.0	4,200.0	4,199.6	4,199.6	9.5	8.9	180.00	-50.8	0.0	50.8	32.4	18.41	2.760	
4,300.0	4,300.0	4,299.6	4,299.5	9.7	9.1	180.00	-51.7	0.0	51.7	32.9	18.83	2.745	
4,400.0	4,400.0	4,399.6	4,399.5	10.0	9.3	180.00	-52.6	0.0	52.6	33.3	19.26	2.729	
4,500.0	4,500.0	4,499.6	4,499.5	10.2	9.5	180.00	-53.4	0.0	53.4	33.8	19.69	2.714	
4,600.0	4,600.0	4,599.6	4,599.5	10.4	9.7	180.00	-54.3	0.0	54.3	34.2	20.11	2.700	
4,700.0	4,700.0	4,699.6	4,699.5	10.6	9.9	180.00	-55.2	0.0	55.2	34.6	20.54	2.686	
4,800.0	4,800.0	4,799.6	4,799.5	10.8	10.1	180.00	-56.1	0.0	56.1	35.1	20.97	2.673	
4,900.0	4,900.0	4,899.6	4,899.5	11.1	10.3	180.00	-56.9	0.0	56.9	35.5	21.40	2.660	
5,000.0	5,000.0	4,999.6	4,999.5	11.3	10.6	180.00	-57.8	0.0	57.8	36.0	21.83	2.647	
5,100.0	5,100.0	5,099.6	5,099.5	11.5	10.8	180.00	-58.7	0.0	58.7	36.4	22.26	2.635	
5,200.0	5,200.0	5,199.6	5,199.5	11.7	11.0	180.00	-59.5	0.0	59.5	36.8	22.70	2.624	
5,300.0	5,300.0	5,299.6	5,299.5	11.9	11.2	180.00	-60.4	0.0	60.4	37.3	23.13	2.612	
5,400.0	5,400.0	5,399.6	5,399.5	12.2	11.4	180.00	-61.3	0.0	61.3	37.7	23.56	2.601	
5,500.0	5,500.0	5,499.6	5,499.5	12.4	11.6	180.00	-62.2	0.0	62.2	38.2	24.00	2.590	
5,600.0	5,600.0	5,599.6	5,599.4	12.6	11.8	180.00	-63.0	0.0	63.0	38.6	24.43	2.580	
5,700.0	5,700.0	5,699.6	5,699.4	12.8	12.0	180.00	-63.9	0.0	63.9	39.0	24.87	2.570	
5,800.0	5,800.0	5,799.6	5,799.4	13.1	12.3	180.00	-64.8	0.0	64.8	39.5	25.31	2.560	
5,900.0	5,900.0	5,899.6	5,899.4	13.3	12.5	180.00	-65.7	0.0	65.7	39.9	25.74	2.550	
6,000.0	6,000.0	5,999.6	5,999.4	13.5	12.7	180.00	-66.5	0.0	66.5	40.3	26.18	2.541	
6,100.0	6,100.0	6,099.6	6,099.4	13.7	12.9	180.00	-67.4	0.0	67.4	40.8	26.62	2.532	
6,200.0	6,200.0	6,199.6	6,199.4	13.9	13.1	180.00	-68.3	0.0	68.3	41.2	27.05	2.523	
6,300.0	6,300.0	6,299.6	6,299.4	14.2	13.3	180.00	-69.1	0.0	69.1	41.7	27.49	2.515	
6,400.0	6,400.0	6,399.5	6,399.4	14.4	13.6	180.00	-70.0	0.0	70.0	42.1	27.93	2.507	
6,500.0	6,500.0	6,499.5	6,499.4	14.6	13.8	180.00	-70.9	0.0	70.9	42.5	28.37	2.499	
6,600.0	6,600.0	6,599.5	6,599.4	14.8	14.0	180.00	-71.8	0.0	71.8	43.0	28.81	2.491	
6,700.0	6,700.0	6,699.5	6,699.4	15.1	14.2	180.00	-72.6	0.0	72.6	43.4	29.25	2.483	
6,800.0	6,800.0	6,799.5	6,799.4	15.3	14.4	180.00	-73.5	0.0	73.5	43.8	29.69	2.476	
6,900.0	6,900.0	6,899.5	6,899.4	15.5	14.6	180.00	-74.4	0.0	74.4	44.2	30.13	2.468	
7,000.0	7,000.0	6,999.5	6,999.3	15.7	14.9	180.00	-75.3	0.0	75.3	44.7	30.57	2.461	
7,100.0	7,100.0	7,099.5	7,099.3	15.9	15.1	180.00	-76.1	0.0	76.1	45.1	31.01	2.455	
7,200.0	7,200.0	7,199.5	7,199.3	16.2	15.3	180.00	-77.0	0.0	77.0	45.5	31.46	2.448	
7,300.0	7,300.0	7,299.5	7,299.3	16.4	15.5	180.00	-77.9	0.0	77.9	46.0	31.90	2.441	
7,400.0	7,400.0	7,399.5	7,399.3	16.6	15.7	180.00	-78.7	0.0	78.7	46.4	32.34	2.435	

CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation

Company:	Oasis	Local Co-ordinate Reference:	Well Kline Federal 5300 31-18 7T2
Project:	Indian Hills	TVD Reference:	WELL @ 2033.0usft (Original Well Elev)
Reference Site:	153N-100W-17/18	MD Reference:	WELL @ 2033.0usft (Original Well Elev)
Site Error:	0.0 usft	North Reference:	True
Reference Well:	Kline Federal 5300 31-18 7T2	Survey Calculation Method:	Minimum Curvature
Well Error:	2.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Kline Federal 5300 31-18 7T2	Database:	EDM_new
Reference Design:	Design #1	Offset TVD Reference:	Offset Datum

Offset Design 153N-100W-17/18 - Kline Federal 5300 31-18 6B - Kline Federal 5300 31-18 6B - Design #1

Survey Program: 0-MWD

Offset Site Error: 0.0 usft
Offset Well Error: 2.0 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
7,500.0	7,500.0	7,499.5	7,499.3	16.8	16.0	180.00	-79.6	0.0	79.6	46.8	32.78	2.429	
7,600.0	7,600.0	7,599.5	7,599.3	17.1	16.2	180.00	-80.5	0.0	80.5	47.3	33.22	2.423	
7,700.0	7,700.0	7,699.5	7,699.3	17.3	16.4	180.00	-81.4	0.0	81.4	47.7	33.67	2.417	
7,800.0	7,800.0	7,799.5	7,799.3	17.5	16.6	180.00	-82.2	0.0	82.2	48.1	34.11	2.411	
7,900.0	7,900.0	7,899.5	7,899.3	17.7	16.8	180.00	-83.1	0.0	83.1	48.6	34.55	2.405	
8,000.0	8,000.0	8,000.2	8,000.0	18.0	17.1	180.00	-83.4	0.0	83.4	48.4	34.99	2.384	
8,100.0	8,100.0	8,100.2	8,100.0	18.2	17.2	180.00	-83.4	0.0	83.4	48.0	35.40	2.356	
8,200.0	8,200.0	8,200.2	8,200.0	18.4	17.4	180.00	-83.4	0.0	83.4	47.6	35.82	2.329	
8,300.0	8,300.0	8,300.2	8,300.0	18.6	17.6	180.00	-83.4	0.0	83.4	47.2	36.23	2.302	
8,400.0	8,400.0	8,400.2	8,400.0	18.8	17.8	180.00	-83.4	0.0	83.4	46.8	36.65	2.276	
8,500.0	8,500.0	8,500.2	8,500.0	19.1	18.0	180.00	-83.4	0.0	83.4	46.3	37.07	2.250	
8,600.0	8,600.0	8,600.2	8,600.0	19.3	18.2	180.00	-83.4	0.0	83.4	45.9	37.48	2.225	
8,700.0	8,700.0	8,700.2	8,700.0	19.5	18.4	180.00	-83.4	0.0	83.4	45.5	37.90	2.201	
8,800.0	8,800.0	8,800.2	8,800.0	19.7	18.6	180.00	-83.4	0.0	83.4	45.1	38.32	2.177	
8,900.0	8,900.0	8,900.2	8,900.0	20.0	18.8	180.00	-83.4	0.0	83.4	44.7	38.74	2.153	
9,000.0	9,000.0	9,000.2	9,000.0	20.2	19.0	180.00	-83.4	0.0	83.4	44.3	39.16	2.130	
9,100.0	9,100.0	9,100.2	9,100.0	20.4	19.2	180.00	-83.4	0.0	83.4	43.8	39.58	2.107	
9,200.0	9,200.0	9,200.2	9,200.0	20.6	19.4	180.00	-83.4	0.0	83.4	43.4	40.00	2.085	
9,300.0	9,300.0	9,300.2	9,300.0	20.9	19.6	180.00	-83.4	0.0	83.4	43.0	40.43	2.063	
9,400.0	9,400.0	9,400.2	9,400.0	21.1	19.8	180.00	-83.4	0.0	83.4	42.6	40.85	2.042	
9,500.0	9,500.0	9,500.2	9,500.0	21.3	20.0	180.00	-83.4	0.0	83.4	42.1	41.27	2.021	
9,600.0	9,600.0	9,600.2	9,600.0	21.5	20.2	180.00	-83.4	0.0	83.4	41.7	41.70	2.000	
9,700.0	9,700.0	9,700.2	9,700.0	21.8	20.4	180.00	-83.4	0.0	83.4	41.3	42.12	1.980	
9,800.0	9,800.0	9,800.2	9,800.0	22.0	20.6	180.00	-83.4	0.0	83.4	40.9	42.55	1.961	
9,900.0	9,900.0	9,900.2	9,900.0	22.2	20.8	180.00	-83.4	0.0	83.4	40.4	42.97	1.941	
10,000.0	10,000.0	10,000.2	10,000.0	22.4	21.0	180.00	-83.4	0.0	83.4	40.0	43.40	1.922	
10,100.0	10,100.0	10,100.2	10,100.0	22.6	21.2	180.00	-83.4	0.0	83.4	39.6	43.82	1.903	
10,200.0	10,200.0	10,200.2	10,200.0	22.9	21.4	180.00	-83.4	0.0	83.4	39.2	44.25	1.885	
10,300.0	10,300.0	10,293.9	10,293.5	23.1	21.6	177.46	-85.7	3.8	86.0	41.4	44.67	1.926	
10,335.5	10,335.5	10,325.0	10,324.1	23.2	21.7	174.65	-88.4	8.3	89.5	44.7	44.82	1.997	
10,350.0	10,350.0	10,338.3	10,337.1	23.2	21.7	49.59	-89.9	10.7	91.3	46.4	44.85	2.035	
10,375.0	10,375.0	10,360.1	10,358.2	23.3	21.7	47.24	-92.7	15.4	94.3	49.4	44.90	2.101	
10,400.0	10,399.8	10,381.7	10,378.9	23.3	21.8	45.10	-95.9	20.8	97.4	52.5	44.90	2.169	
10,425.0	10,424.5	10,403.2	10,399.2	23.3	21.8	43.14	-99.7	27.0	100.4	55.5	44.84	2.239	
10,450.0	10,448.9	10,425.0	10,419.3	23.4	21.9	41.32	-103.9	34.1	103.3	58.6	44.72	2.310	
10,475.0	10,473.0	10,445.8	10,438.2	23.4	21.9	39.70	-108.4	41.5	106.2	61.6	44.54	2.384	
10,500.0	10,496.8	10,466.9	10,456.9	23.5	22.0	38.20	-113.4	49.8	108.9	64.7	44.29	2.460	
10,525.0	10,520.1	10,487.9	10,475.1	23.5	22.0	36.83	-118.8	58.8	111.6	67.6	43.97	2.538	
10,550.0	10,542.9	10,508.7	10,492.8	23.6	22.1	35.56	-124.5	68.3	114.1	70.5	43.59	2.617	
10,575.0	10,565.1	10,529.5	10,509.8	23.7	22.2	34.41	-130.7	78.5	116.4	73.3	43.14	2.699	
10,600.0	10,586.7	10,550.0	10,526.1	23.7	22.2	33.35	-137.1	89.1	118.6	76.0	42.64	2.782	
10,625.0	10,607.6	10,570.8	10,542.0	23.8	22.3	32.37	-143.9	100.5	120.6	78.6	42.08	2.867	
10,650.0	10,627.7	10,591.3	10,557.2	23.9	22.4	31.48	-151.0	112.3	122.5	81.0	41.47	2.953	
10,675.0	10,647.1	10,611.7	10,571.7	23.9	22.5	30.66	-158.4	124.6	124.1	83.3	40.82	3.041	
10,700.0	10,665.6	10,632.1	10,585.6	24.0	22.6	29.91	-166.2	137.4	125.6	85.4	40.14	3.129	
10,725.0	10,683.2	10,652.4	10,598.8	24.1	22.7	29.22	-174.1	150.7	126.8	87.4	39.42	3.217	
10,750.0	10,699.9	10,675.0	10,612.6	24.2	22.8	28.53	-183.3	166.0	127.9	89.2	38.69	3.305	
10,775.0	10,715.5	10,692.9	10,623.0	24.4	22.9	28.03	-190.9	178.5	128.7	90.7	37.95	3.390	
10,800.0	10,730.1	10,713.1	10,634.0	24.5	23.1	27.51	-199.6	193.0	129.2	92.0	37.22	3.473	
10,825.0	10,743.6	10,733.2	10,644.3	24.6	23.2	27.05	-208.5	207.8	129.6	93.1	36.50	3.551	
10,850.0	10,756.1	10,753.4	10,653.8	24.8	23.4	26.63	-217.7	223.0	129.8	94.0	35.80	3.624	
10,875.0	10,767.3	10,775.0	10,663.2	25.0	23.5	26.23	-227.7	239.7	129.7	94.5	35.15	3.690	

CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation

Company:	Oasis	Local Co-ordinate Reference:	Well Kline Federal 5300 31-18 7T2
Project:	Indian Hills	TVD Reference:	WELL @ 2033.0usft (Original Well Elev)
Reference Site:	153N-100W-17/18	MD Reference:	WELL @ 2033.0usft (Original Well Elev)
Site Error:	0.0 usft	North Reference:	True
Reference Well:	Kline Federal 5300 31-18 7T2	Survey Calculation Method:	Minimum Curvature
Well Error:	2.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Kline Federal 5300 31-18 7T2	Database:	EDM_new
Reference Design:	Design #1	Offset TVD Reference:	Offset Datum

Offset Design 153N-100W-17/18 - Kline Federal 5300 31-18 6B - Kline Federal 5300 31-18 6B - Design #1

Survey Program: 0-MWD

Offset Site Error: 0.0 usft
Offset Well Error: 2.0 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
10,900.0	10,777.4	10,793.6	10,670.6	25.2	23.7	25.94	-236.6	254.4	129.4	94.8	34.54	3.744	
10,925.0	10,786.2	10,813.8	10,677.8	25.4	23.9	25.66	-246.2	270.5	128.8	94.8	34.01	3.788	
10,950.0	10,793.9	10,833.9	10,684.2	25.6	24.1	25.42	-256.1	286.8	128.0	94.5	33.55	3.816	
10,975.0	10,800.2	10,854.0	10,689.8	25.8	24.3	25.23	-266.1	303.4	127.0	93.8	33.17	3.829	
11,000.0	10,805.3	10,875.0	10,694.8	26.1	24.5	25.07	-276.6	320.8	125.8	92.9	32.90	3.822	
11,025.0	10,809.1	10,894.4	10,698.6	26.4	24.7	24.97	-286.4	337.1	124.3	91.5	32.74	3.796	
11,050.0	10,811.6	10,914.6	10,701.7	26.7	25.0	24.91	-296.7	354.2	122.6	89.9	32.70	3.749	
11,075.0	10,812.8	10,934.8	10,704.0	26.9	25.2	24.89	-307.0	371.4	120.6	87.9	32.77	3.681	
11,083.8	10,813.0	10,942.0	10,704.6	27.0	25.3	24.90	-310.7	377.5	119.9	87.1	32.83	3.652	
11,100.0	10,813.0	10,955.1	10,705.5	27.3	25.5	24.84	-317.5	388.8	118.8	85.8	32.94	3.605	
11,200.0	10,813.4	11,051.2	10,706.2	28.6	26.9	23.70	-366.2	471.5	117.1	83.6	33.44	3.502	
11,300.0	10,813.7	11,152.8	10,706.4	30.3	28.5	22.36	-414.8	560.7	116.1	82.2	33.93	3.422	
11,400.0	10,814.1	11,254.2	10,706.5	32.0	30.3	20.98	-460.1	651.5	115.2	80.8	34.42	3.346	
11,500.0	10,814.4	11,355.6	10,706.7	34.0	32.3	19.55	-502.2	743.7	114.3	79.4	34.90	3.276	
11,600.0	10,814.8	11,456.8	10,706.9	36.0	34.4	18.07	-540.9	837.3	113.5	78.2	35.32	3.214	
11,700.0	10,815.2	11,558.0	10,707.1	38.2	36.7	16.56	-576.2	932.0	112.8	77.1	35.67	3.162	
11,800.0	10,815.5	11,659.0	10,707.3	40.5	39.0	15.01	-608.2	1,027.9	112.1	76.1	35.95	3.118	
11,900.0	10,815.9	11,759.9	10,707.4	42.8	41.4	13.42	-636.7	1,124.7	111.5	75.3	36.16	3.084	
12,000.0	10,816.3	11,860.7	10,707.6	45.2	43.8	11.81	-661.8	1,222.3	111.0	74.7	36.31	3.057	
12,100.0	10,816.6	11,961.4	10,707.8	47.6	46.3	10.16	-683.4	1,320.7	110.6	74.1	36.44	3.034	
12,200.0	10,817.0	12,062.0	10,708.0	50.1	48.8	8.50	-701.5	1,419.6	110.2	73.6	36.57	3.014	
12,300.0	10,817.3	12,162.5	10,708.2	52.6	51.3	6.81	-716.1	1,519.0	110.0	73.2	36.76	2.992	
12,400.0	10,817.7	12,262.8	10,708.4	55.1	53.9	5.11	-727.2	1,618.7	109.8	72.7	37.05	2.964	
12,500.0	10,818.1	12,363.0	10,708.5	57.6	56.4	3.41	-734.8	1,718.6	109.7	72.2	37.51	2.926	
12,515.8	10,818.1	12,378.8	10,708.6	58.0	56.8	3.14	-735.7	1,734.4	109.7	72.1	37.60	2.918	
12,600.0	10,818.4	12,463.2	10,708.7	60.1	59.0	1.70	-738.9	1,818.7	109.8	71.6	38.19	2.874	
12,700.0	10,818.8	12,563.2	10,708.9	62.7	61.5	0.09	-739.7	1,918.7	109.9	70.8	39.14	2.808	
12,761.3	10,819.0	12,624.5	10,709.0	64.2	63.1	-0.25	-739.7	1,980.0	110.0	70.2	39.81	2.763	
12,800.0	10,819.1	12,663.2	10,709.1	65.2	64.1	-0.25	-739.7	2,018.6	110.1	69.8	40.24	2.735	
12,900.0	10,819.5	12,763.2	10,709.2	67.8	66.7	-0.25	-739.7	2,118.6	110.2	68.9	41.36	2.665	
13,000.0	10,819.8	12,863.2	10,709.4	70.3	69.4	-0.25	-739.7	2,218.6	110.4	67.9	42.50	2.598	
13,100.0	10,820.2	12,963.2	10,709.6	73.0	72.0	-0.25	-739.7	2,318.6	110.6	66.9	43.67	2.533	
13,200.0	10,820.5	13,063.2	10,709.8	75.6	74.7	-0.25	-739.7	2,418.6	110.8	65.9	44.85	2.470	
13,300.0	10,820.9	13,163.2	10,709.9	78.3	77.4	-0.25	-739.7	2,518.6	110.9	64.9	46.04	2.410	
13,400.0	10,821.2	13,263.2	10,710.1	80.9	80.1	-0.25	-739.7	2,618.6	111.1	63.9	47.25	2.352	
13,500.0	10,821.6	13,363.2	10,710.3	83.6	82.8	-0.25	-739.7	2,718.6	111.3	62.8	48.48	2.296	
13,600.0	10,821.9	13,463.2	10,710.5	86.3	85.6	-0.25	-739.7	2,818.6	111.5	61.8	49.72	2.242	
13,700.0	10,822.3	13,563.2	10,710.6	89.1	88.3	-0.25	-739.7	2,918.6	111.6	60.7	50.97	2.190	
13,800.0	10,822.6	13,663.2	10,710.8	91.8	91.1	-0.25	-739.7	3,018.6	111.8	59.6	52.23	2.141	
13,900.0	10,823.0	13,763.2	10,711.0	94.6	93.9	-0.25	-739.7	3,118.6	112.0	58.5	53.50	2.093	
14,000.0	10,823.3	13,863.2	10,711.2	97.3	96.7	-0.25	-739.7	3,218.6	112.2	57.4	54.78	2.047	
14,100.0	10,823.7	13,963.2	10,711.3	100.1	99.5	-0.25	-739.7	3,318.6	112.3	56.3	56.08	2.003	
14,200.0	10,824.0	14,063.2	10,711.5	102.9	102.3	-0.25	-739.7	3,418.6	112.5	55.1	57.38	1.961	
14,300.0	10,824.4	14,163.2	10,711.7	105.7	105.1	-0.25	-739.7	3,518.6	112.7	54.0	58.68	1.920	
14,400.0	10,824.7	14,263.2	10,711.8	108.5	107.9	-0.25	-739.7	3,618.6	112.9	52.9	60.00	1.881	
14,500.0	10,825.1	14,363.2	10,712.0	111.3	110.7	-0.25	-739.7	3,718.6	113.0	51.7	61.32	1.843	
14,600.0	10,825.4	14,463.2	10,712.2	114.1	113.5	-0.25	-739.7	3,818.6	113.2	50.6	62.65	1.807	
14,700.0	10,825.8	14,563.2	10,712.4	116.9	116.4	-0.25	-739.7	3,918.6	113.4	49.4	63.98	1.772	
14,800.0	10,826.1	14,663.2	10,712.5	119.7	119.2	-0.25	-739.7	4,018.6	113.6	48.2	65.32	1.738	
14,900.0	10,826.5	14,763.2	10,712.7	122.5	122.0	-0.25	-739.7	4,118.6	113.7	47.1	66.67	1.706	
15,000.0	10,826.8	14,863.2	10,712.9	125.4	124.9	-0.24	-739.7	4,218.6	113.9	45.9	68.02	1.675	
15,100.0	10,827.2	14,963.2	10,713.1	128.2	127.7	-0.24	-739.7	4,318.6	114.1	44.7	69.37	1.644	

CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation

Company:	Oasis	Local Co-ordinate Reference:	Well Kline Federal 5300 31-18 7T2
Project:	Indian Hills	TVD Reference:	WELL @ 2033.0usft (Original Well Elev)
Reference Site:	153N-100W-17/18	MD Reference:	WELL @ 2033.0usft (Original Well Elev)
Site Error:	0.0 usft	North Reference:	True
Reference Well:	Kline Federal 5300 31-18 7T2	Survey Calculation Method:	Minimum Curvature
Well Error:	2.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Kline Federal 5300 31-18 7T2	Database:	EDM_new
Reference Design:	Design #1	Offset TVD Reference:	Offset Datum

Offset Design 153N-100W-17/18 - Kline Federal 5300 31-18 6B - Kline Federal 5300 31-18 6B - Design #1

Offset Site Error: 0.0 usft
Offset Well Error: 2.0 usft

Survey Program: 0-MWD

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
15,200.0	10,827.5	15,063.2	10,713.2	131.0	130.6	-0.24	-739.7	4,418.6	114.3	43.5	70.73	1.615	
15,300.0	10,827.9	15,163.2	10,713.4	133.9	133.4	-0.24	-739.7	4,518.6	114.4	42.3	72.10	1.587	
15,400.0	10,828.2	15,263.2	10,713.6	136.7	136.3	-0.24	-739.7	4,618.6	114.6	41.1	73.47	1.560	
15,500.0	10,828.6	15,363.2	10,713.8	139.6	139.2	-0.24	-739.7	4,718.6	114.8	39.9	74.84	1.534	
15,600.0	10,828.9	15,463.2	10,713.9	142.4	142.0	-0.24	-739.7	4,818.6	115.0	38.7	76.21	1.508	
15,700.0	10,829.2	15,563.2	10,714.1	145.3	144.9	-0.24	-739.7	4,918.6	115.1	37.5	77.59	1.484	Level 3Level 3
15,800.0	10,829.6	15,663.2	10,714.3	148.1	147.8	-0.24	-739.7	5,018.6	115.3	36.3	78.97	1.460	Level 3Level 3
15,900.0	10,829.9	15,763.2	10,714.5	151.0	150.6	-0.24	-739.7	5,118.6	115.5	35.1	80.36	1.437	Level 3Level 3
16,000.0	10,830.3	15,863.2	10,714.6	153.9	153.5	-0.24	-739.7	5,218.6	115.7	33.9	81.75	1.415	Level 3Level 3
16,100.0	10,830.6	15,963.2	10,714.8	156.7	156.4	-0.24	-739.7	5,318.6	115.8	32.7	83.14	1.393	Level 3Level 3
16,200.0	10,831.0	16,063.2	10,715.0	159.6	159.3	-0.24	-739.7	5,418.6	116.0	31.5	84.53	1.372	Level 3Level 3
16,300.0	10,831.3	16,163.2	10,715.2	162.5	162.2	-0.24	-739.7	5,518.6	116.2	30.3	85.92	1.352	Level 3Level 3
16,400.0	10,831.7	16,263.2	10,715.3	165.3	165.0	-0.24	-739.7	5,618.6	116.4	29.0	87.32	1.332	Level 3Level 3
16,500.0	10,832.0	16,363.2	10,715.5	168.2	167.9	-0.24	-739.7	5,718.6	116.5	27.8	88.72	1.313	Level 3Level 3
16,600.0	10,832.4	16,463.2	10,715.7	171.1	170.8	-0.24	-739.7	5,818.6	116.7	26.6	90.13	1.295	Level 3Level 3
16,700.0	10,832.7	16,563.2	10,715.9	174.0	173.7	-0.24	-739.7	5,918.6	116.9	25.3	91.53	1.277	Level 3Level 3
16,800.0	10,833.1	16,663.2	10,716.0	176.9	176.6	-0.24	-739.7	6,018.6	117.1	24.1	92.94	1.259	Level 3Level 3
16,900.0	10,833.4	16,763.2	10,716.2	179.7	179.5	-0.24	-739.7	6,118.6	117.2	22.9	94.34	1.243	Level 2
17,000.0	10,833.8	16,863.2	10,716.4	182.6	182.4	-0.24	-739.7	6,218.6	117.4	21.6	95.75	1.226	Level 2
17,100.0	10,834.1	16,963.2	10,716.6	185.5	185.3	-0.24	-739.7	6,318.6	117.6	20.4	97.17	1.210	Level 2
17,200.0	10,834.5	17,063.2	10,716.7	188.4	188.2	-0.24	-739.7	6,418.6	117.8	19.2	98.58	1.194	Level 2
17,300.0	10,834.8	17,163.2	10,716.9	191.3	191.0	-0.24	-739.7	6,518.6	117.9	17.9	99.99	1.179	Level 2
17,400.0	10,835.2	17,263.2	10,717.1	194.2	193.9	-0.24	-739.7	6,618.6	118.1	16.7	101.41	1.165	Level 2
17,500.0	10,835.5	17,363.2	10,717.3	197.1	196.8	-0.24	-739.7	6,718.6	118.3	15.4	102.83	1.150	Level 2
17,600.0	10,835.9	17,463.2	10,717.4	200.0	199.7	-0.24	-739.7	6,818.6	118.4	14.2	104.25	1.136	Level 2
17,700.0	10,836.2	17,563.2	10,717.6	202.9	202.6	-0.24	-739.7	6,918.6	118.6	13.0	105.67	1.123	Level 2
17,800.0	10,836.6	17,663.2	10,717.8	205.8	205.5	-0.23	-739.7	7,018.6	118.8	11.7	107.09	1.109	Level 2
17,900.0	10,836.9	17,763.2	10,718.0	208.6	208.4	-0.23	-739.7	7,118.6	119.0	10.5	108.51	1.096	Level 2
18,000.0	10,837.3	17,863.2	10,718.1	211.5	211.3	-0.23	-739.7	7,218.6	119.1	9.2	109.93	1.084	Level 2
18,100.0	10,837.6	17,963.2	10,718.3	214.4	214.2	-0.23	-739.7	7,318.6	119.3	8.0	111.36	1.071	Level 2
18,200.0	10,838.0	18,063.2	10,718.5	217.3	217.1	-0.23	-739.7	7,418.6	119.5	6.7	112.79	1.059	Level 2
18,300.0	10,838.3	18,163.2	10,718.7	220.2	220.1	-0.23	-739.7	7,518.6	119.7	5.5	114.21	1.048	Level 2
18,400.0	10,838.7	18,263.2	10,718.8	223.1	223.0	-0.23	-739.7	7,618.6	119.8	4.2	115.64	1.036	Level 2
18,500.0	10,839.0	18,363.2	10,719.0	226.0	225.9	-0.23	-739.7	7,718.6	120.0	2.9	117.07	1.025	Level 2
18,600.0	10,839.4	18,463.2	10,719.2	228.9	228.8	-0.23	-739.7	7,818.6	120.2	1.7	118.50	1.014	Level 2
18,700.0	10,839.7	18,563.2	10,719.4	231.8	231.7	-0.23	-739.7	7,918.6	120.4	0.4	119.93	1.004	Level 2
18,800.0	10,840.1	18,663.2	10,719.5	234.7	234.6	-0.23	-739.7	8,018.6	120.5	-0.8	121.36	0.993	Level 1
18,900.0	10,840.4	18,763.2	10,719.7	237.7	237.5	-0.23	-739.7	8,118.6	120.7	-2.1	122.80	0.983	Level 1
19,000.0	10,840.8	18,863.2	10,719.9	240.6	240.4	-0.23	-739.7	8,218.6	120.9	-3.3	124.23	0.973	Level 1
19,100.0	10,841.1	18,963.2	10,720.1	243.5	243.3	-0.23	-739.7	8,318.6	121.1	-4.6	125.66	0.963	Level 1
19,200.0	10,841.5	19,063.2	10,720.2	246.4	246.2	-0.23	-739.7	8,418.6	121.2	-5.9	127.10	0.954	Level 1
19,300.0	10,841.8	19,163.2	10,720.4	249.3	249.1	-0.23	-739.7	8,518.6	121.4	-7.1	128.53	0.945	Level 1
19,400.0	10,842.2	19,263.2	10,720.6	252.2	252.0	-0.23	-739.7	8,618.6	121.6	-8.4	129.97	0.936	Level 1
19,500.0	10,842.5	19,363.2	10,720.7	255.1	255.0	-0.23	-739.7	8,718.6	121.8	-9.6	131.41	0.927	Level 1
19,600.0	10,842.9	19,463.2	10,720.9	258.0	257.9	-0.23	-739.7	8,818.6	121.9	-10.9	132.85	0.918	Level 1
19,700.0	10,843.2	19,563.2	10,721.1	260.9	260.8	-0.23	-739.7	8,918.6	122.1	-12.2	134.28	0.909	Level 1
19,800.0	10,843.6	19,663.1	10,721.3	263.8	263.7	-0.23	-739.7	9,018.6	122.3	-13.4	135.72	0.901	Level 1
19,900.0	10,843.9	19,763.1	10,721.4	266.7	266.6	-0.23	-739.7	9,118.6	122.5	-14.7	137.16	0.893	Level 1
20,000.0	10,844.3	19,863.1	10,721.6	269.6	269.5	-0.23	-739.7	9,218.6	122.6	-16.0	138.60	0.885	Level 1
20,100.0	10,844.6	19,963.1	10,721.8	272.5	272.4	-0.23	-739.7	9,318.6	122.8	-17.2	140.04	0.877	Level 1
20,200.0	10,845.0	20,063.1	10,722.0	275.5	275.3	-0.23	-739.7	9,418.6	123.0	-18.5	141.49	0.869	Level 1
20,300.0	10,845.3	20,163.1	10,722.1	278.4	278.3	-0.23	-739.7	9,518.6	123.2	-19.8	142.93	0.862	Level 1

CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation

Company:	Oasis	Local Co-ordinate Reference:	Well Kline Federal 5300 31-18 7T2
Project:	Indian Hills	TVD Reference:	WELL @ 2033.0usft (Original Well Elev)
Reference Site:	153N-100W-17/18	MD Reference:	WELL @ 2033.0usft (Original Well Elev)
Site Error:	0.0 usft	North Reference:	True
Reference Well:	Kline Federal 5300 31-18 7T2	Survey Calculation Method:	Minimum Curvature
Well Error:	2.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Kline Federal 5300 31-18 7T2	Database:	EDM_new
Reference Design:	Design #1	Offset TVD Reference:	Offset Datum

Offset Design 153N-100W-17/18 - Kline Federal 5300 31-18 6B - Kline Federal 5300 31-18 6B - Design #1

Survey Program: 0-MWD

Offset Site Error: 0.0 usft
Offset Well Error: 2.0 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
20,400.0	10,845.7	20,263.1	10,722.3	281.3	281.2	-0.23	-739.7	9,618.6	123.3	-21.0	144.37	0.854	Level 1
20,500.0	10,846.0	20,363.1	10,722.5	284.2	284.1	-0.23	-739.7	9,718.6	123.5	-22.3	145.81	0.847	Level 1
20,600.0	10,846.4	20,463.1	10,722.7	287.1	287.0	-0.23	-739.7	9,818.6	123.7	-23.6	147.26	0.840	Level 1
20,700.0	10,846.7	20,563.1	10,722.8	290.0	289.9	-0.23	-739.7	9,918.6	123.9	-24.8	148.70	0.833	Level 1
20,800.0	10,847.1	20,663.1	10,723.0	292.9	292.8	-0.22	-739.7	10,018.6	124.0	-26.1	150.14	0.826	Level 1
20,831.6	10,847.2	20,694.5	10,723.1	293.9	293.8	-0.22	-739.7	10,050.0	124.1	-26.5	150.60	0.824	Level 1, ES, SF

Company:	Oasis	Local Co-ordinate Reference:	Well Kline Federal 5300 31-18 7T2
Project:	Indian Hills	TVD Reference:	WELL @ 2033.0usft (Original Well Elev)
Reference Site:	153N-100W-17/18	MD Reference:	WELL @ 2033.0usft (Original Well Elev)
Site Error:	0.0 usft	North Reference:	True
Reference Well:	Kline Federal 5300 31-18 7T2	Survey Calculation Method:	Minimum Curvature
Well Error:	2.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Kline Federal 5300 31-18 7T2	Database:	EDM_new
Reference Design:	Design #1	Offset TVD Reference:	Offset Datum

Offset Design 153N-100W-17/18 - Kline Federal 5300 31-18 8T - Kline Federal 5300 31-18 8T - Design #1

Offset Site Error: 0.0 usft
Offset Well Error: 2.0 usft

Survey Program: 0-MWD

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
0.0	0.0	0.0	0.0	2.0	2.0	0.00	32.4	0.0	32.4				
100.0	100.0	100.0	100.0	2.0	2.0	0.00	32.4	0.0	32.4	28.4	4.00	8.098	
200.0	200.0	200.0	200.0	2.0	2.0	0.00	32.4	0.0	32.4	28.4	4.05	8.010	
300.0	300.0	300.0	300.0	2.1	2.1	0.00	32.4	0.0	32.4	28.3	4.14	7.831	
400.0	400.0	400.0	400.0	2.1	2.1	0.00	32.4	0.0	32.4	28.1	4.28	7.578	
500.0	500.0	500.0	500.0	2.2	2.2	0.00	32.4	0.0	32.4	28.0	4.46	7.274	
600.0	600.0	600.0	600.0	2.3	2.3	0.00	32.4	0.0	32.4	27.7	4.67	6.938	
700.0	700.0	700.0	700.0	2.5	2.5	0.00	32.4	0.0	32.4	27.5	4.92	6.589	
800.0	800.0	800.0	800.0	2.6	2.6	0.00	32.4	0.0	32.4	27.2	5.20	6.240	
900.0	900.0	900.0	900.0	2.7	2.7	0.00	32.4	0.0	32.4	26.9	5.49	5.902	
1,000.0	1,000.0	1,000.0	1,000.0	2.9	2.9	0.00	32.4	0.0	32.4	26.6	5.81	5.580	
1,100.0	1,100.0	1,100.0	1,100.0	3.1	3.1	0.00	32.4	0.0	32.4	26.3	6.14	5.277	
1,200.0	1,200.0	1,200.0	1,200.0	3.2	3.2	0.00	32.4	0.0	32.4	25.9	6.49	4.994	
1,300.0	1,300.0	1,300.0	1,300.0	3.4	3.4	0.00	32.4	0.0	32.4	25.6	6.85	4.732	
1,400.0	1,400.0	1,400.0	1,400.0	3.6	3.6	0.00	32.4	0.0	32.4	25.2	7.22	4.490	
1,500.0	1,500.0	1,500.0	1,500.0	3.8	3.8	0.00	32.4	0.0	32.4	24.8	7.60	4.266	
1,600.0	1,600.0	1,600.0	1,600.0	4.0	4.0	0.00	32.4	0.0	32.4	24.4	7.99	4.060	
1,700.0	1,700.0	1,700.0	1,700.0	4.2	4.2	0.00	32.4	0.0	32.4	24.0	8.38	3.870	
1,800.0	1,800.0	1,800.0	1,800.0	4.4	4.4	0.00	32.4	0.0	32.4	23.6	8.78	3.695	
1,900.0	1,900.0	1,900.0	1,900.0	4.6	4.6	0.00	32.4	0.0	32.4	23.2	9.18	3.533	
2,000.0	2,000.0	2,000.0	2,000.0	4.8	4.8	0.00	32.4	0.0	32.4	22.8	9.58	3.383	
2,100.0	2,100.0	2,100.0	2,100.0	5.0	5.0	0.00	32.4	0.0	32.4	22.4	9.99	3.244	
2,200.0	2,200.0	2,200.0	2,200.0	5.2	5.2	0.00	32.4	0.0	32.4	22.0	10.41	3.115	CC
2,300.0	2,300.0	2,299.7	2,299.7	5.4	5.4	0.00	33.2	0.0	33.2	22.4	10.82	3.069	
2,400.0	2,400.0	2,399.7	2,399.7	5.6	5.6	0.00	34.1	0.0	34.1	22.9	11.24	3.033	
2,500.0	2,500.0	2,499.7	2,499.7	5.8	5.8	0.00	35.0	0.0	35.0	23.3	11.66	2.998	
2,600.0	2,600.0	2,599.7	2,599.7	6.0	6.0	0.00	35.8	0.0	35.8	23.8	12.09	2.965	
2,700.0	2,700.0	2,699.7	2,699.7	6.3	6.3	0.00	36.7	0.0	36.7	24.2	12.51	2.934	
2,800.0	2,800.0	2,799.7	2,799.7	6.5	6.5	0.00	37.6	0.0	37.6	24.6	12.94	2.905	
2,900.0	2,900.0	2,899.7	2,899.7	6.7	6.7	0.00	38.5	0.0	38.5	25.1	13.36	2.877	
3,000.0	3,000.0	2,999.7	2,999.7	6.9	6.9	0.00	39.3	0.0	39.3	25.5	13.79	2.851	
3,100.0	3,100.0	3,099.7	3,099.6	7.1	7.1	0.00	40.2	0.0	40.2	26.0	14.22	2.826	
3,200.0	3,200.0	3,199.7	3,199.6	7.3	7.3	0.00	41.1	0.0	41.1	26.4	14.66	2.802	
3,300.0	3,300.0	3,299.7	3,299.6	7.5	7.5	0.00	41.9	0.0	41.9	26.9	15.09	2.780	
3,400.0	3,400.0	3,399.7	3,399.6	7.8	7.8	0.00	42.8	0.0	42.8	27.3	15.52	2.758	
3,500.0	3,500.0	3,499.7	3,499.6	8.0	8.0	0.00	43.7	0.0	43.7	27.7	15.96	2.738	
3,600.0	3,600.0	3,599.7	3,599.6	8.2	8.2	0.00	44.6	0.0	44.6	28.2	16.39	2.719	
3,700.0	3,700.0	3,699.7	3,699.6	8.4	8.4	0.00	45.4	0.0	45.4	28.6	16.83	2.700	
3,800.0	3,800.0	3,799.7	3,799.6	8.6	8.6	0.00	46.3	0.0	46.3	29.0	17.27	2.682	
3,900.0	3,900.0	3,899.7	3,899.6	8.9	8.9	0.00	47.2	0.0	47.2	29.5	17.70	2.665	
4,000.0	4,000.0	3,999.6	3,999.6	9.1	9.1	0.00	48.1	0.0	48.1	29.9	18.14	2.649	
4,100.0	4,100.0	4,099.6	4,099.6	9.3	9.3	0.00	48.9	0.0	48.9	30.3	18.58	2.633	
4,200.0	4,200.0	4,199.6	4,199.6	9.5	9.5	0.00	49.8	0.0	49.8	30.8	19.02	2.619	
4,300.0	4,300.0	4,299.6	4,299.6	9.7	9.7	0.00	50.7	0.0	50.7	31.2	19.46	2.604	
4,400.0	4,400.0	4,399.6	4,399.6	10.0	10.0	0.00	51.5	0.0	51.5	31.6	19.90	2.590	
4,500.0	4,500.0	4,499.6	4,499.5	10.2	10.2	0.00	52.4	0.0	52.4	32.1	20.34	2.577	
4,600.0	4,600.0	4,599.6	4,599.5	10.4	10.4	0.00	53.3	0.0	53.3	32.5	20.78	2.565	
4,700.0	4,700.0	4,699.6	4,699.5	10.6	10.6	0.00	54.2	0.0	54.2	32.9	21.22	2.552	
4,800.0	4,800.0	4,799.6	4,799.5	10.8	10.8	0.00	55.0	0.0	55.0	33.4	21.66	2.541	
4,900.0	4,900.0	4,899.6	4,899.5	11.1	11.1	0.00	55.9	0.0	55.9	33.8	22.10	2.529	
5,000.0	5,000.0	4,999.6	4,999.5	11.3	11.3	0.00	56.8	0.0	56.8	34.2	22.55	2.518	
5,100.0	5,100.0	5,099.6	5,099.5	11.5	11.5	0.00	57.7	0.0	57.7	34.7	22.99	2.508	

CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation

Company:	Oasis	Local Co-ordinate Reference:	Well Kline Federal 5300 31-18 7T2
Project:	Indian Hills	TVD Reference:	WELL @ 2033.0usft (Original Well Elev)
Reference Site:	153N-100W-17/18	MD Reference:	WELL @ 2033.0usft (Original Well Elev)
Site Error:	0.0 usft	North Reference:	True
Reference Well:	Kline Federal 5300 31-18 7T2	Survey Calculation Method:	Minimum Curvature
Well Error:	2.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Kline Federal 5300 31-18 7T2	Database:	EDM_new
Reference Design:	Design #1	Offset TVD Reference:	Offset Datum

Offset Design 153N-100W-17/18 - Kline Federal 5300 31-18 8T - Kline Federal 5300 31-18 8T - Design #1

Survey Program: 0-MWD

Offset Site Error: 0.0 usft
Offset Well Error: 2.0 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
5,200.0	5,200.0	5,199.6	5,199.5	11.7	11.7	0.00	58.5	0.0	58.5	35.1	23.43	2.498	
5,300.0	5,300.0	5,299.6	5,299.5	11.9	11.9	0.00	59.4	0.0	59.4	35.5	23.87	2.488	
5,400.0	5,400.0	5,399.6	5,399.5	12.2	12.2	0.00	60.3	0.0	60.3	36.0	24.32	2.479	
5,500.0	5,500.0	5,499.6	5,499.5	12.4	12.4	0.00	61.1	0.0	61.1	36.4	24.76	2.469	
5,600.0	5,600.0	5,599.6	5,599.5	12.6	12.6	0.00	62.0	0.0	62.0	36.8	25.20	2.461	
5,700.0	5,700.0	5,699.6	5,699.5	12.8	12.8	0.00	62.9	0.0	62.9	37.2	25.65	2.452	
5,800.0	5,800.0	5,799.6	5,799.4	13.1	13.1	0.00	63.8	0.0	63.8	37.7	26.09	2.444	
5,900.0	5,900.0	5,899.6	5,899.4	13.3	13.3	0.00	64.6	0.0	64.6	38.1	26.54	2.436	
6,000.0	6,000.0	5,999.6	5,999.4	13.5	13.5	0.00	65.5	0.0	65.5	38.5	26.98	2.428	
6,100.0	6,100.0	6,099.6	6,099.4	13.7	13.7	0.00	66.4	0.0	66.4	39.0	27.43	2.420	
6,200.0	6,200.0	6,199.6	6,199.4	13.9	13.9	0.00	67.3	0.0	67.3	39.4	27.87	2.413	
6,300.0	6,300.0	6,299.6	6,299.4	14.2	14.2	0.00	68.1	0.0	68.1	39.8	28.31	2.406	
6,400.0	6,400.0	6,399.6	6,399.4	14.4	14.4	0.00	69.0	0.0	69.0	40.2	28.76	2.399	
6,500.0	6,500.0	6,499.6	6,499.4	14.6	14.6	0.00	69.9	0.0	69.9	40.7	29.21	2.392	
6,600.0	6,600.0	6,599.5	6,599.4	14.8	14.8	0.00	70.7	0.0	70.7	41.1	29.65	2.386	
6,700.0	6,700.0	6,699.5	6,699.4	15.1	15.1	0.00	71.6	0.0	71.6	41.5	30.10	2.380	
6,800.0	6,800.0	6,799.5	6,799.4	15.3	15.3	0.00	72.5	0.0	72.5	41.9	30.54	2.373	
6,900.0	6,900.0	6,899.5	6,899.4	15.5	15.5	0.00	73.4	0.0	73.4	42.4	30.99	2.367	
7,000.0	7,000.0	6,999.5	6,999.4	15.7	15.7	0.00	74.2	0.0	74.2	42.8	31.43	2.362	
7,100.0	7,100.0	7,099.5	7,099.3	15.9	15.9	0.00	75.1	0.0	75.1	43.2	31.88	2.356	
7,200.0	7,200.0	7,199.5	7,199.3	16.2	16.2	0.00	76.0	0.0	76.0	43.7	32.32	2.351	
7,300.0	7,300.0	7,299.5	7,299.3	16.4	16.4	0.00	76.8	0.0	76.9	44.1	32.77	2.345	
7,400.0	7,400.0	7,399.5	7,399.3	16.6	16.6	0.00	77.7	0.0	77.7	44.5	33.22	2.340	
7,500.0	7,500.0	7,499.5	7,499.3	16.8	16.8	0.00	78.6	0.0	78.6	44.9	33.66	2.335	
7,600.0	7,600.0	7,599.5	7,599.3	17.1	17.1	0.00	79.5	0.0	79.5	45.4	34.11	2.330	
7,700.0	7,700.0	7,699.5	7,699.3	17.3	17.3	0.00	80.3	0.0	80.3	45.8	34.56	2.325	
7,800.0	7,800.0	7,799.5	7,799.3	17.5	17.5	0.00	81.2	0.0	81.2	46.2	35.00	2.320	
7,900.0	7,900.0	7,899.5	7,899.3	17.7	17.7	0.00	82.1	0.0	82.1	46.6	35.45	2.316	
8,000.0	8,000.0	8,000.2	8,000.0	18.0	17.9	0.00	82.4	0.0	82.4	46.5	35.88	2.297	
8,100.0	8,100.0	8,100.2	8,100.0	18.2	18.2	0.00	82.4	0.0	82.4	46.1	36.32	2.268	
8,200.0	8,200.0	8,200.2	8,200.0	18.4	18.4	0.00	82.4	0.0	82.4	45.6	36.77	2.241	
8,300.0	8,300.0	8,300.2	8,300.0	18.6	18.6	0.00	82.4	0.0	82.4	45.2	37.22	2.214	
8,400.0	8,400.0	8,400.2	8,400.0	18.8	18.8	0.00	82.4	0.0	82.4	44.7	37.66	2.188	
8,500.0	8,500.0	8,500.2	8,500.0	19.1	19.1	0.00	82.4	0.0	82.4	44.3	38.11	2.162	
8,600.0	8,600.0	8,600.2	8,600.0	19.3	19.3	0.00	82.4	0.0	82.4	43.8	38.56	2.137	
8,700.0	8,700.0	8,700.2	8,700.0	19.5	19.5	0.00	82.4	0.0	82.4	43.4	39.00	2.113	
8,800.0	8,800.0	8,800.2	8,800.0	19.7	19.7	0.00	82.4	0.0	82.4	42.9	39.45	2.089	
8,900.0	8,900.0	8,900.2	8,900.0	20.0	19.9	0.00	82.4	0.0	82.4	42.5	39.90	2.065	
9,000.0	9,000.0	9,000.2	9,000.0	20.2	20.2	0.00	82.4	0.0	82.4	42.1	40.34	2.042	
9,100.0	9,100.0	9,100.2	9,100.0	20.4	20.4	0.00	82.4	0.0	82.4	41.6	40.79	2.020	
9,200.0	9,200.0	9,200.2	9,200.0	20.6	20.6	0.00	82.4	0.0	82.4	41.2	41.24	1.998	
9,300.0	9,300.0	9,300.2	9,300.0	20.9	20.8	0.00	82.4	0.0	82.4	40.7	41.69	1.977	
9,400.0	9,400.0	9,400.2	9,400.0	21.1	21.1	0.00	82.4	0.0	82.4	40.3	42.13	1.956	
9,500.0	9,500.0	9,500.2	9,500.0	21.3	21.3	0.00	82.4	0.0	82.4	39.8	42.58	1.935	
9,600.0	9,600.0	9,600.2	9,600.0	21.5	21.5	0.00	82.4	0.0	82.4	39.4	43.03	1.915	
9,700.0	9,700.0	9,700.2	9,700.0	21.8	21.7	0.00	82.4	0.0	82.4	38.9	43.47	1.895	
9,800.0	9,800.0	9,800.2	9,800.0	22.0	22.0	0.00	82.4	0.0	82.4	38.5	43.92	1.876	
9,900.0	9,900.0	9,900.2	9,900.0	22.2	22.2	0.00	82.4	0.0	82.4	38.0	44.37	1.857	
10,000.0	10,000.0	10,000.2	10,000.0	22.4	22.4	0.00	82.4	0.0	82.4	37.6	44.82	1.838	
10,100.0	10,100.0	10,100.2	10,100.0	22.6	22.6	0.00	82.4	0.0	82.4	37.1	45.26	1.820	
10,200.0	10,200.0	10,200.2	10,200.0	22.9	22.9	0.00	82.4	0.0	82.4	36.7	45.71	1.802	
10,300.0	10,300.0	10,301.0	10,300.8	23.1	23.1	0.12	82.3	0.2	82.3	36.2	46.16	1.784	

CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation

Company:	Oasis	Local Co-ordinate Reference:	Well Kline Federal 5300 31-18 7T2
Project:	Indian Hills	TVD Reference:	WELL @ 2033.0usft (Original Well Elev)
Reference Site:	153N-100W-17/18	MD Reference:	WELL @ 2033.0usft (Original Well Elev)
Site Error:	0.0 usft	North Reference:	True
Reference Well:	Kline Federal 5300 31-18 7T2	Survey Calculation Method:	Minimum Curvature
Well Error:	2.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Kline Federal 5300 31-18 7T2	Database:	EDM_new
Reference Design:	Design #1	Offset TVD Reference:	Offset Datum

Offset Design 153N-100W-17/18 - Kline Federal 5300 31-18 8T - Kline Federal 5300 31-18 8T - Design #1

Survey Program: 0-MWD

Offset Site Error: 0.0 usft
Offset Well Error: 2.0 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
10,335.5	10,335.5	10,338.5	10,338.1	23.2	23.1	1.78	81.5	2.5	81.6	35.3	46.31	1.762	
10,350.0	10,350.0	10,353.6	10,353.2	23.2	23.2	-120.71	80.9	4.3	81.2	34.8	46.38	1.750	
10,375.0	10,375.0	10,379.7	10,378.9	23.3	23.2	-118.73	79.5	8.3	80.8	34.3	46.45	1.738	
10,389.8	10,389.7	10,395.1	10,394.0	23.3	23.3	-117.48	78.4	11.3	80.7	34.2	46.49	1.735	
10,400.0	10,399.8	10,405.6	10,404.2	23.3	23.3	-116.59	77.6	13.6	80.7	34.2	46.51	1.735	
10,425.0	10,424.5	10,431.3	10,428.9	23.3	23.3	-114.33	75.3	20.2	81.1	34.5	46.57	1.741	
10,450.0	10,448.9	10,456.8	10,453.0	23.4	23.4	-111.98	72.5	27.9	81.9	35.2	46.64	1.755	
10,475.0	10,473.0	10,482.1	10,476.5	23.4	23.4	-109.58	69.4	36.7	83.1	36.3	46.72	1.778	
10,500.0	10,496.8	10,507.2	10,499.3	23.5	23.5	-107.16	65.9	46.7	84.7	37.9	46.82	1.809	
10,525.0	10,520.1	10,532.1	10,521.4	23.5	23.6	-104.77	62.0	57.7	86.7	39.8	46.93	1.848	
10,550.0	10,542.9	10,556.9	10,542.6	23.6	23.6	-102.43	57.8	69.6	89.2	42.1	47.06	1.895	
10,575.0	10,565.1	10,581.4	10,563.0	23.7	23.7	-100.16	53.2	82.4	92.0	44.8	47.21	1.949	
10,600.0	10,586.7	10,605.8	10,582.6	23.7	23.8	-98.00	48.3	96.2	95.2	47.9	47.38	2.010	
10,625.0	10,607.6	10,629.9	10,601.2	23.8	23.9	-95.94	43.2	110.7	98.8	51.3	47.55	2.078	
10,650.0	10,627.7	10,653.9	10,618.9	23.9	24.0	-93.99	37.8	126.0	102.7	55.0	47.73	2.152	
10,675.0	10,647.1	10,677.7	10,635.6	23.9	24.1	-92.17	32.1	141.9	106.9	59.0	47.92	2.232	
10,700.0	10,665.6	10,701.4	10,651.3	24.0	24.2	-90.46	26.3	158.5	111.4	63.3	48.11	2.316	
10,725.0	10,683.2	10,725.0	10,666.2	24.1	24.3	-88.87	20.1	175.9	116.2	67.9	48.31	2.405	
10,750.0	10,699.9	10,748.1	10,679.8	24.2	24.4	-87.41	13.9	193.5	121.1	72.6	48.51	2.497	
10,775.0	10,715.5	10,771.3	10,692.6	24.4	24.6	-86.04	7.4	211.7	126.3	77.6	48.72	2.593	
10,800.0	10,730.1	10,794.3	10,704.3	24.5	24.7	-84.78	0.8	230.4	131.7	82.8	48.95	2.691	
10,825.0	10,743.6	10,817.2	10,715.0	24.6	24.9	-83.61	-5.9	249.4	137.2	88.0	49.18	2.790	
10,850.0	10,756.1	10,839.9	10,724.6	24.8	25.1	-82.53	-12.8	268.8	142.9	93.5	49.43	2.891	
10,875.0	10,767.3	10,862.6	10,733.2	25.0	25.2	-81.53	-19.8	288.6	148.7	99.0	49.69	2.992	
10,900.0	10,777.4	10,885.1	10,740.8	25.2	25.5	-80.60	-26.9	308.6	154.5	104.6	49.98	3.092	
10,925.0	10,786.2	10,907.5	10,747.4	25.4	25.7	-79.75	-34.0	328.8	160.5	110.2	50.29	3.192	
10,950.0	10,793.9	10,929.8	10,752.9	25.6	25.9	-78.96	-41.3	349.2	166.5	115.9	50.62	3.290	
10,975.0	10,800.2	10,952.1	10,757.4	25.8	26.1	-78.23	-48.5	369.7	172.6	121.6	50.97	3.386	
11,000.0	10,805.3	10,975.0	10,760.9	26.1	26.4	-77.56	-56.1	391.1	178.7	127.3	51.37	3.478	
11,025.0	10,809.1	10,996.4	10,763.3	26.4	26.7	-76.93	-63.2	411.1	184.8	133.0	51.77	3.569	
11,050.0	10,811.6	11,018.5	10,764.7	26.7	26.9	-76.36	-70.5	431.9	190.9	138.6	52.21	3.655	
11,075.0	10,812.8	11,040.7	10,765.1	26.9	27.2	-75.84	-78.0	452.8	196.9	144.2	52.69	3.738	
11,083.8	10,813.0	11,048.7	10,765.1	27.0	27.3	-75.71	-80.6	460.4	199.0	146.2	52.88	3.764	
11,100.0	10,813.0	11,063.4	10,765.2	27.3	27.5	-76.00	-85.4	474.3	202.9	149.6	53.31	3.806	
11,200.0	10,813.4	11,153.8	10,765.7	28.6	28.9	-77.54	-113.4	560.2	226.8	170.6	56.22	4.034	
11,300.0	10,813.7	11,243.5	10,766.1	30.3	30.3	-78.78	-138.5	646.3	250.5	191.0	59.45	4.213	
11,400.0	10,814.1	11,332.6	10,766.6	32.0	32.0	-79.78	-160.7	732.6	273.9	210.9	62.95	4.350	
11,500.0	10,814.4	11,421.1	10,767.1	34.0	33.7	-80.62	-180.1	818.9	296.9	230.3	66.68	4.453	
11,600.0	10,814.8	11,509.0	10,767.5	36.0	35.5	-81.32	-196.7	905.3	319.7	249.1	70.60	4.528	
11,700.0	10,815.2	11,600.0	10,768.0	38.2	37.5	-81.94	-211.1	995.1	342.1	267.3	74.74	4.577	
11,800.0	10,815.5	11,683.3	10,768.5	40.5	39.4	-82.44	-221.8	1,077.8	364.0	285.2	78.84	4.617	
11,900.0	10,815.9	11,769.7	10,768.9	42.8	41.4	-82.88	-230.4	1,163.7	385.6	302.5	83.10	4.640	
12,000.0	10,816.3	11,855.7	10,769.4	45.2	43.4	-83.28	-236.3	1,249.4	406.7	319.3	87.39	4.653	
12,100.0	10,816.6	11,941.1	10,769.8	47.6	45.5	-83.62	-239.6	1,334.8	427.3	335.6	91.71	4.659	
12,200.0	10,817.0	12,028.6	10,770.3	50.1	47.6	-83.93	-240.5	1,422.3	447.4	351.3	96.08	4.656	
12,300.0	10,817.3	12,127.0	10,770.8	52.6	50.0	-84.21	-240.5	1,520.7	465.0	364.3	100.74	4.616	
12,400.0	10,817.7	12,226.0	10,771.3	55.1	52.5	-84.43	-240.5	1,619.7	479.2	373.8	105.40	4.547	
12,500.0	10,818.1	12,325.4	10,771.8	57.6	55.1	-84.58	-240.5	1,719.1	490.0	380.0	110.04	4.453	
12,600.0	10,818.4	12,425.1	10,772.4	60.1	57.7	-84.69	-240.5	1,818.8	497.3	382.7	114.64	4.338	
12,700.0	10,818.8	12,525.0	10,772.9	62.7	60.3	-84.75	-240.5	1,918.7	501.2	382.0	119.16	4.206	
12,761.3	10,819.0	12,586.3	10,773.2	64.2	62.0	-84.77	-240.5	1,980.0	501.8	380.0	121.89	4.117	
12,800.0	10,819.1	12,625.0	10,773.4	65.2	63.0	-84.77	-240.5	2,018.7	501.8	377.9	123.96	4.048	

CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation

Company:	Oasis	Local Co-ordinate Reference:	Well Kline Federal 5300 31-18 7T2
Project:	Indian Hills	TVD Reference:	WELL @ 2033.0usft (Original Well Elev)
Reference Site:	153N-100W-17/18	MD Reference:	WELL @ 2033.0usft (Original Well Elev)
Site Error:	0.0 usft	North Reference:	True
Reference Well:	Kline Federal 5300 31-18 7T2	Survey Calculation Method:	Minimum Curvature
Well Error:	2.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Kline Federal 5300 31-18 7T2	Database:	EDM_new
Reference Design:	Design #1	Offset TVD Reference:	Offset Datum

Offset Design 153N-100W-17/18 - Kline Federal 5300 31-18 8T - Kline Federal 5300 31-18 8T - Design #1

Survey Program: 0-MWD

Offset Site Error: 0.0 usft
Offset Well Error: 2.0 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
12,900.0	10,819.5	12,725.0	10,773.9	67.8	65.7	-84.79	-240.5	2,118.7	501.8	372.5	129.34	3.880	
13,000.0	10,819.8	12,825.0	10,774.5	70.3	68.4	-84.81	-240.5	2,218.7	501.8	367.0	134.75	3.724	
13,100.0	10,820.2	12,925.0	10,775.0	73.0	71.1	-84.83	-240.5	2,318.7	501.8	361.6	140.21	3.579	
13,200.0	10,820.5	13,025.0	10,775.5	75.6	73.8	-84.85	-240.5	2,418.7	501.8	356.1	145.69	3.444	
13,300.0	10,820.9	13,125.0	10,776.0	78.3	76.6	-84.87	-240.5	2,518.7	501.8	350.6	151.20	3.318	
13,400.0	10,821.2	13,225.0	10,776.6	80.9	79.4	-84.89	-240.5	2,618.7	501.7	345.0	156.74	3.201	
13,500.0	10,821.6	13,325.0	10,777.1	83.6	82.1	-84.91	-240.5	2,718.7	501.7	339.4	162.30	3.091	
13,600.0	10,821.9	13,425.0	10,777.6	86.3	84.9	-84.93	-240.5	2,818.7	501.7	333.8	167.87	2.989	
13,700.0	10,822.3	13,525.0	10,778.1	89.1	87.7	-84.95	-240.5	2,918.7	501.7	328.2	173.47	2.892	
13,800.0	10,822.6	13,625.0	10,778.6	91.8	90.5	-84.97	-240.5	3,018.7	501.7	322.6	179.08	2.801	
13,900.0	10,823.0	13,725.0	10,779.2	94.6	93.3	-84.99	-240.5	3,118.7	501.7	317.0	184.71	2.716	
14,000.0	10,823.3	13,825.0	10,779.7	97.3	96.2	-85.01	-240.5	3,218.7	501.6	311.3	190.35	2.635	
14,100.0	10,823.7	13,925.0	10,780.2	100.1	99.0	-85.03	-240.5	3,318.7	501.6	305.6	196.00	2.559	
14,200.0	10,824.0	14,025.0	10,780.7	102.9	101.8	-85.05	-240.5	3,418.7	501.6	299.9	201.67	2.487	
14,300.0	10,824.4	14,125.0	10,781.3	105.7	104.6	-85.07	-240.5	3,518.7	501.6	294.3	207.34	2.419	
14,400.0	10,824.7	14,225.0	10,781.8	108.5	107.5	-85.09	-240.5	3,618.7	501.6	288.6	213.03	2.355	
14,500.0	10,825.1	14,325.0	10,782.3	111.3	110.3	-85.11	-240.5	3,718.7	501.6	282.9	218.72	2.293	
14,600.0	10,825.4	14,425.0	10,782.8	114.1	113.2	-85.13	-240.5	3,818.7	501.6	277.1	224.42	2.235	
14,700.0	10,825.8	14,525.0	10,783.4	116.9	116.0	-85.15	-240.5	3,918.7	501.5	271.4	230.13	2.179	
14,800.0	10,826.1	14,625.0	10,783.9	119.7	118.9	-85.17	-240.5	4,018.7	501.5	265.7	235.85	2.126	
14,900.0	10,826.5	14,725.0	10,784.4	122.5	121.8	-85.19	-240.5	4,118.7	501.5	259.9	241.57	2.076	
15,000.0	10,826.8	14,825.0	10,784.9	125.4	124.6	-85.21	-240.5	4,218.7	501.5	254.2	247.30	2.028	
15,100.0	10,827.2	14,925.0	10,785.5	128.2	127.5	-85.23	-240.5	4,318.7	501.5	248.4	253.04	1.982	
15,200.0	10,827.5	15,025.0	10,786.0	131.0	130.4	-85.25	-240.5	4,418.7	501.5	242.7	258.78	1.938	
15,300.0	10,827.9	15,125.0	10,786.5	133.9	133.2	-85.27	-240.5	4,518.7	501.5	236.9	264.53	1.896	
15,400.0	10,828.2	15,225.0	10,787.0	136.7	136.1	-85.29	-240.5	4,618.7	501.4	231.2	270.28	1.855	
15,500.0	10,828.6	15,325.0	10,787.6	139.6	139.0	-85.31	-240.5	4,718.7	501.4	225.4	276.03	1.817	
15,600.0	10,828.9	15,425.0	10,788.1	142.4	141.9	-85.33	-240.5	4,818.7	501.4	219.6	281.79	1.779	
15,700.0	10,829.2	15,525.0	10,788.6	145.3	144.8	-85.35	-240.5	4,918.7	501.4	213.8	287.56	1.744	
15,800.0	10,829.6	15,625.0	10,789.1	148.1	147.7	-85.37	-240.5	5,018.6	501.4	208.1	293.32	1.709	
15,900.0	10,829.9	15,725.0	10,789.6	151.0	150.5	-85.39	-240.5	5,118.6	501.4	202.3	299.10	1.676	
16,000.0	10,830.3	15,825.0	10,790.2	153.9	153.4	-85.41	-240.5	5,218.6	501.4	196.5	304.87	1.644	
16,100.0	10,830.6	15,925.0	10,790.7	156.7	156.3	-85.43	-240.5	5,318.6	501.3	190.7	310.65	1.614	
16,200.0	10,831.0	16,025.0	10,791.2	159.6	159.2	-85.45	-240.5	5,418.6	501.3	184.9	316.43	1.584	
16,300.0	10,831.3	16,125.0	10,791.7	162.5	162.1	-85.47	-240.5	5,518.6	501.3	179.1	322.21	1.556	
16,400.0	10,831.7	16,225.0	10,792.3	165.3	165.0	-85.49	-240.5	5,618.6	501.3	173.3	328.00	1.528	
16,500.0	10,832.0	16,325.0	10,792.8	168.2	167.9	-85.51	-240.5	5,718.6	501.3	167.5	333.79	1.502	
16,600.0	10,832.4	16,425.0	10,793.3	171.1	170.8	-85.53	-240.5	5,818.6	501.3	161.7	339.58	1.476	Level 3Level 3
16,700.0	10,832.7	16,525.0	10,793.8	174.0	173.7	-85.55	-240.5	5,918.6	501.3	155.9	345.37	1.451	Level 3Level 3
16,800.0	10,833.1	16,625.0	10,794.4	176.9	176.6	-85.57	-240.5	6,018.6	501.2	150.1	351.17	1.427	Level 3Level 3
16,900.0	10,833.4	16,725.0	10,794.9	179.7	179.5	-85.59	-240.5	6,118.6	501.2	144.3	356.97	1.404	Level 3Level 3
17,000.0	10,833.8	16,825.0	10,795.4	182.6	182.4	-85.61	-240.5	6,218.6	501.2	138.4	362.77	1.382	Level 3Level 3
17,100.0	10,834.1	16,925.0	10,795.9	185.5	185.3	-85.63	-240.5	6,318.6	501.2	132.6	368.57	1.360	Level 3Level 3
17,200.0	10,834.5	17,025.0	10,796.5	188.4	188.2	-85.65	-240.5	6,418.6	501.2	126.8	374.38	1.339	Level 3Level 3
17,300.0	10,834.8	17,125.0	10,797.0	191.3	191.1	-85.67	-240.5	6,518.6	501.2	121.0	380.18	1.318	Level 3Level 3
17,400.0	10,835.2	17,225.0	10,797.5	194.2	194.0	-85.69	-240.5	6,618.6	501.2	115.2	385.99	1.298	Level 3Level 3
17,500.0	10,835.5	17,325.0	10,798.0	197.1	196.9	-85.71	-240.5	6,718.6	501.2	109.4	391.80	1.279	Level 3Level 3
17,600.0	10,835.9	17,425.0	10,798.5	200.0	199.8	-85.73	-240.5	6,818.6	501.1	103.5	397.61	1.260	Level 3Level 3
17,700.0	10,836.2	17,525.0	10,799.1	202.9	202.7	-85.75	-240.5	6,918.6	501.1	97.7	403.43	1.242	Level 2
17,800.0	10,836.6	17,625.0	10,799.6	205.8	205.6	-85.77	-240.5	7,018.6	501.1	91.9	409.24	1.224	Level 2
17,900.0	10,836.9	17,725.0	10,800.1	208.6	208.5	-85.79	-240.5	7,118.6	501.1	86.0	415.06	1.207	Level 2
18,000.0	10,837.3	17,825.0	10,800.6	211.5	211.4	-85.81	-240.5	7,218.6	501.1	80.2	420.87	1.191	Level 2

CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation

Company:	Oasis	Local Co-ordinate Reference:	Well Kline Federal 5300 31-18 7T2
Project:	Indian Hills	TVD Reference:	WELL @ 2033.0usft (Original Well Elev)
Reference Site:	153N-100W-17/18	MD Reference:	WELL @ 2033.0usft (Original Well Elev)
Site Error:	0.0 usft	North Reference:	True
Reference Well:	Kline Federal 5300 31-18 7T2	Survey Calculation Method:	Minimum Curvature
Well Error:	2.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Kline Federal 5300 31-18 7T2	Database:	EDM_new
Reference Design:	Design #1	Offset TVD Reference:	Offset Datum

Offset Design 153N-100W-17/18 - Kline Federal 5300 31-18 8T - Kline Federal 5300 31-18 8T - Design #1

Offset Site Error: 0.0 usft
Offset Well Error: 2.0 usft

Survey Program: 0-MWD

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
18,100.0	10,837.6	17,925.0	10,801.2	214.4	214.4	-85.83	-240.5	7,318.6	501.1	74.4	426.69	1.174	Level 2
18,200.0	10,838.0	18,025.0	10,801.7	217.3	217.3	-85.85	-240.5	7,418.6	501.1	68.5	432.51	1.158	Level 2
18,300.0	10,838.3	18,125.0	10,802.2	220.2	220.2	-85.87	-240.5	7,518.6	501.0	62.7	438.33	1.143	Level 2
18,400.0	10,838.7	18,225.0	10,802.7	223.1	223.1	-85.89	-240.5	7,618.6	501.0	56.9	444.16	1.128	Level 2
18,500.0	10,839.0	18,325.0	10,803.3	226.0	226.0	-85.91	-240.5	7,718.6	501.0	51.0	449.98	1.113	Level 2
18,600.0	10,839.4	18,425.0	10,803.8	228.9	228.9	-85.93	-240.5	7,818.6	501.0	45.2	455.80	1.099	Level 2
18,700.0	10,839.7	18,525.0	10,804.3	231.8	231.8	-85.95	-240.5	7,918.6	501.0	39.4	461.63	1.085	Level 2
18,800.0	10,840.1	18,625.0	10,804.8	234.7	234.7	-85.97	-240.5	8,018.6	501.0	33.5	467.46	1.072	Level 2
18,900.0	10,840.4	18,725.0	10,805.4	237.7	237.7	-85.99	-240.5	8,118.6	501.0	27.7	473.29	1.059	Level 2
19,000.0	10,840.8	18,825.0	10,805.9	240.6	240.6	-86.01	-240.5	8,218.6	501.0	21.8	479.11	1.046	Level 2
19,100.0	10,841.1	18,925.0	10,806.4	243.5	243.5	-86.03	-240.5	8,318.6	501.0	16.0	484.94	1.033	Level 2
19,200.0	10,841.5	19,025.0	10,806.9	246.4	246.4	-86.05	-240.5	8,418.6	500.9	10.2	490.78	1.021	Level 2
19,300.0	10,841.8	19,125.0	10,807.4	249.3	249.3	-86.07	-240.5	8,518.6	500.9	4.3	496.61	1.009	Level 2
19,400.0	10,842.2	19,225.0	10,808.0	252.2	252.2	-86.09	-240.5	8,618.6	500.9	-1.5	502.44	0.997	Level 1
19,500.0	10,842.5	19,325.0	10,808.5	255.1	255.1	-86.11	-240.5	8,718.6	500.9	-7.4	508.27	0.985	Level 1
19,600.0	10,842.9	19,425.0	10,809.0	258.0	258.1	-86.13	-240.5	8,818.6	500.9	-13.2	514.11	0.974	Level 1
19,700.0	10,843.2	19,525.0	10,809.5	260.9	261.0	-86.15	-240.5	8,918.6	500.9	-19.1	519.94	0.963	Level 1
19,800.0	10,843.6	19,625.0	10,810.1	263.8	263.9	-86.17	-240.5	9,018.6	500.9	-24.9	525.78	0.953	Level 1
19,900.0	10,843.9	19,725.0	10,810.6	266.7	266.8	-86.19	-240.5	9,118.6	500.9	-30.8	531.62	0.942	Level 1
20,000.0	10,844.3	19,825.0	10,811.1	269.6	269.7	-86.21	-240.5	9,218.6	500.8	-36.6	537.45	0.932	Level 1
20,100.0	10,844.6	19,925.0	10,811.6	272.5	272.6	-86.23	-240.5	9,318.6	500.8	-42.5	543.29	0.922	Level 1
20,200.0	10,845.0	20,025.0	10,812.2	275.5	275.6	-86.25	-240.5	9,418.6	500.8	-48.3	549.13	0.912	Level 1
20,300.0	10,845.3	20,125.0	10,812.7	278.4	278.5	-86.27	-240.5	9,518.6	500.8	-54.2	554.97	0.902	Level 1
20,400.0	10,845.7	20,225.0	10,813.2	281.3	281.4	-86.29	-240.5	9,618.6	500.8	-60.0	560.81	0.893	Level 1
20,500.0	10,846.0	20,325.0	10,813.7	284.2	284.3	-86.31	-240.5	9,718.6	500.8	-65.9	566.65	0.884	Level 1
20,600.0	10,846.4	20,425.0	10,814.3	287.1	287.2	-86.32	-240.5	9,818.6	500.8	-71.7	572.49	0.875	Level 1
20,700.0	10,846.7	20,525.0	10,814.8	290.0	290.2	-86.34	-240.5	9,918.6	500.8	-77.6	578.34	0.866	Level 1
20,800.0	10,847.1	20,625.0	10,815.3	292.9	293.1	-86.36	-240.5	10,018.6	500.8	-83.4	584.18	0.857	Level 1
20,825.4	10,847.1	20,650.4	10,815.4	293.7	293.8	-86.37	-240.5	10,044.0	500.8	-84.9	585.66	0.855	Level 1
20,831.6	10,847.2	20,656.4	10,815.5	293.9	294.0	-86.37	-240.5	10,050.0	500.8	-85.3	586.02	0.854	Level 1, ES, SF

Company:	Oasis	Local Co-ordinate Reference:	Well Kline Federal 5300 31-18 7T2
Project:	Indian Hills	TVD Reference:	WELL @ 2033.0usft (Original Well Elev)
Reference Site:	153N-100W-17/18	MD Reference:	WELL @ 2033.0usft (Original Well Elev)
Site Error:	0.0 usft	North Reference:	True
Reference Well:	Kline Federal 5300 31-18 7T2	Survey Calculation Method:	Minimum Curvature
Well Error:	2.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Kline Federal 5300 31-18 7T2	Database:	EDM_new
Reference Design:	Design #1	Offset TVD Reference:	Offset Datum

Reference Depths are relative to WELL @ 2033.0usft (Original Well ElcCoordinates are relative to: Kline Federal 5300 31-18 7T2
Offset Depths are relative to Offset Datum
Coordinate System is US State Plane 1983, North Dakota Northern Zone
Central Meridian is 100° 30' 0.000 W
Grid Convergence at Surface is: -2.31°

LEGEND

line Federal 5300 31-18 6B, Design #1 V0 — Kline Federal 5300 31-18 8T, Kline Federal 5300 31-18 8T, Design #1 V0

Company:	Oasis	Local Co-ordinate Reference:	Well Kline Federal 5300 31-18 7T2
Project:	Indian Hills	TVD Reference:	WELL @ 2033.0usft (Original Well Elev)
Reference Site:	153N-100W-17/18	MD Reference:	WELL @ 2033.0usft (Original Well Elev)
Site Error:	0.0 usft	North Reference:	True
Reference Well:	Kline Federal 5300 31-18 7T2	Survey Calculation Method:	Minimum Curvature
Well Error:	2.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Kline Federal 5300 31-18 7T2	Database:	EDM_new
Reference Design:	Design #1	Offset TVD Reference:	Offset Datum

Reference Depths are relative to WELL @ 2033.0usft (Original Well ElеCoordinates are relative to: Kline Federal 5300 31-18 7T2
Offset Depths are relative to Offset Datum
Coordinate System is US State Plane 1983, North Dakota Northern Zone
Central Meridian is 100° 30' 0.000 W
Grid Convergence at Surface is: -2.31°

LEGEND

line Federal 5300 31-18 6B, Design #1 V0 — Kline Federal 5300 31-18 8T, Kline Federal 5300 31-18 8T, Design #1 V0

Oasis

Indian Hills
153N-100W-17/18
Kline Federal 5300 31-18 7T2

Kline Federal 5300 31-18 7T2

Plan: Design #1

Standard Planning Report

18 July, 2014

Database:	EDM_new	Local Co-ordinate Reference:	Well Kline Federal 5300 31-18 7T2
Company:	Oasis	TVD Reference:	WELL @ 2033.0usft (Original Well Elev)
Project:	Indian Hills	MD Reference:	WELL @ 2033.0usft (Original Well Elev)
Site:	153N-100W-17/18	North Reference:	True
Well:	Kline Federal 5300 31-18 7T2	Survey Calculation Method:	Minimum Curvature
Wellbore:	Kline Federal 5300 31-18 7T2		
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 31-18 7T2

Well Position	**+N/-S**	-1,777.3 usft	**Northing:**	407,189.33 usft	**Latitude:**	48° 4' 27.840 N
	+E/-W	-67.9 usft	**Easting:**	1,210,089.73 usft	**Longitude:**	103° 36' 11.380 W
Position Uncertainty		2.0 usft	**Wellhead Elevation:**		**Ground Level:**	2,008.0 usft

Wellbore Kline Federal 5300 31-18 7T2

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	5/28/2014	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	
10,335.5	0.00	0.00	10,335.5	0.0	0.0	0.00	0.00	0.00	0.00	
11,083.8	89.80	123.55	10,813.0	-263.0	396.5	12.00	12.00	0.00	123.55	
12,761.3	89.80	90.00	10,819.0	-740.2	1,979.8	2.00	0.00	-2.00	-90.06	
20,831.6	89.80	90.00	10,847.2	-740.2	10,050.0	0.00	0.00	0.00	0.00	Kline Federal 5300

Database:	EDM_new	Local Co-ordinate Reference:	Well Kline Federal 5300 31-18 7T2
Company:	Oasis	TVD Reference:	WELL @ 2033.0usft (Original Well Elev)
Project:	Indian Hills	MD Reference:	WELL @ 2033.0usft (Original Well Elev)
Site:	153N-100W-17/18	North Reference:	True
Well:	Kline Federal 5300 31-18 7T2	Survey Calculation Method:	Minimum Curvature
Wellbore:	Kline Federal 5300 31-18 7T2		
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)
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00
100.0	0.00	0.00	100.0	0.0	0.0	0.0	0.00	0.00	0.00
200.0	0.00	0.00	200.0	0.0	0.0	0.0	0.00	0.00	0.00
300.0	0.00	0.00	300.0	0.0	0.0	0.0	0.00	0.00	0.00
400.0	0.00	0.00	400.0	0.0	0.0	0.0	0.00	0.00	0.00
500.0	0.00	0.00	500.0	0.0	0.0	0.0	0.00	0.00	0.00
600.0	0.00	0.00	600.0	0.0	0.0	0.0	0.00	0.00	0.00
700.0	0.00	0.00	700.0	0.0	0.0	0.0	0.00	0.00	0.00
800.0	0.00	0.00	800.0	0.0	0.0	0.0	0.00	0.00	0.00
900.0	0.00	0.00	900.0	0.0	0.0	0.0	0.00	0.00	0.00
1,000.0	0.00	0.00	1,000.0	0.0	0.0	0.0	0.00	0.00	0.00
1,100.0	0.00	0.00	1,100.0	0.0	0.0	0.0	0.00	0.00	0.00
1,200.0	0.00	0.00	1,200.0	0.0	0.0	0.0	0.00	0.00	0.00
1,300.0	0.00	0.00	1,300.0	0.0	0.0	0.0	0.00	0.00	0.00
1,400.0	0.00	0.00	1,400.0	0.0	0.0	0.0	0.00	0.00	0.00
1,500.0	0.00	0.00	1,500.0	0.0	0.0	0.0	0.00	0.00	0.00
1,600.0	0.00	0.00	1,600.0	0.0	0.0	0.0	0.00	0.00	0.00
1,700.0	0.00	0.00	1,700.0	0.0	0.0	0.0	0.00	0.00	0.00
1,800.0	0.00	0.00	1,800.0	0.0	0.0	0.0	0.00	0.00	0.00
1,900.0	0.00	0.00	1,900.0	0.0	0.0	0.0	0.00	0.00	0.00
1,923.0	0.00	0.00	1,923.0	0.0	0.0	0.0	0.00	0.00	0.00
Pierre									
2,000.0	0.00	0.00	2,000.0	0.0	0.0	0.0	0.00	0.00	0.00
2,023.0	0.00	0.00	2,023.0	0.0	0.0	0.0	0.00	0.00	0.00
13-3/8" Surface									
2,100.0	0.00	0.00	2,100.0	0.0	0.0	0.0	0.00	0.00	0.00
2,200.0	0.00	0.00	2,200.0	0.0	0.0	0.0	0.00	0.00	0.00
2,300.0	0.00	0.00	2,300.0	0.0	0.0	0.0	0.00	0.00	0.00
2,400.0	0.00	0.00	2,400.0	0.0	0.0	0.0	0.00	0.00	0.00
2,500.0	0.00	0.00	2,500.0	0.0	0.0	0.0	0.00	0.00	0.00
2,600.0	0.00	0.00	2,600.0	0.0	0.0	0.0	0.00	0.00	0.00
2,700.0	0.00	0.00	2,700.0	0.0	0.0	0.0	0.00	0.00	0.00
2,800.0	0.00	0.00	2,800.0	0.0	0.0	0.0	0.00	0.00	0.00
2,900.0	0.00	0.00	2,900.0	0.0	0.0	0.0	0.00	0.00	0.00
3,000.0	0.00	0.00	3,000.0	0.0	0.0	0.0	0.00	0.00	0.00
3,100.0	0.00	0.00	3,100.0	0.0	0.0	0.0	0.00	0.00	0.00
3,200.0	0.00	0.00	3,200.0	0.0	0.0	0.0	0.00	0.00	0.00
3,300.0	0.00	0.00	3,300.0	0.0	0.0	0.0	0.00	0.00	0.00
3,400.0	0.00	0.00	3,400.0	0.0	0.0	0.0	0.00	0.00	0.00
3,500.0	0.00	0.00	3,500.0	0.0	0.0	0.0	0.00	0.00	0.00
3,600.0	0.00	0.00	3,600.0	0.0	0.0	0.0	0.00	0.00	0.00
3,700.0	0.00	0.00	3,700.0	0.0	0.0	0.0	0.00	0.00	0.00
3,800.0	0.00	0.00	3,800.0	0.0	0.0	0.0	0.00	0.00	0.00
3,900.0	0.00	0.00	3,900.0	0.0	0.0	0.0	0.00	0.00	0.00
4,000.0	0.00	0.00	4,000.0	0.0	0.0	0.0	0.00	0.00	0.00
4,100.0	0.00	0.00	4,100.0	0.0	0.0	0.0	0.00	0.00	0.00
4,200.0	0.00	0.00	4,200.0	0.0	0.0	0.0	0.00	0.00	0.00
4,300.0	0.00	0.00	4,300.0	0.0	0.0	0.0	0.00	0.00	0.00
4,400.0	0.00	0.00	4,400.0	0.0	0.0	0.0	0.00	0.00	0.00
4,500.0	0.00	0.00	4,500.0	0.0	0.0	0.0	0.00	0.00	0.00
4,570.0	0.00	0.00	4,570.0	0.0	0.0	0.0	0.00	0.00	0.00
Greenhorn									
4,600.0	0.00	0.00	4,600.0	0.0	0.0	0.0	0.00	0.00	0.00

Database:	EDM_new	Local Co-ordinate Reference:	Well Kline Federal 5300 31-18 7T2
Company:	Oasis	TVD Reference:	WELL @ 2033.0usft (Original Well Elev)
Project:	Indian Hills	MD Reference:	WELL @ 2033.0usft (Original Well Elev)
Site:	153N-100W-17/18	North Reference:	True
Well:	Kline Federal 5300 31-18 7T2	Survey Calculation Method:	Minimum Curvature
Wellbore:	Kline Federal 5300 31-18 7T2		
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)
4,700.0	0.00	0.00	4,700.0	0.0	0.0	0.0	0.00	0.00	0.00
4,800.0	0.00	0.00	4,800.0	0.0	0.0	0.0	0.00	0.00	0.00
4,900.0	0.00	0.00	4,900.0	0.0	0.0	0.0	0.00	0.00	0.00
4,976.0	0.00	0.00	4,976.0	0.0	0.0	0.0	0.00	0.00	0.00
Mowry									
5,000.0	0.00	0.00	5,000.0	0.0	0.0	0.0	0.00	0.00	0.00
5,100.0	0.00	0.00	5,100.0	0.0	0.0	0.0	0.00	0.00	0.00
5,200.0	0.00	0.00	5,200.0	0.0	0.0	0.0	0.00	0.00	0.00
5,300.0	0.00	0.00	5,300.0	0.0	0.0	0.0	0.00	0.00	0.00
5,400.0	0.00	0.00	5,400.0	0.0	0.0	0.0	0.00	0.00	0.00
5,403.0	0.00	0.00	5,403.0	0.0	0.0	0.0	0.00	0.00	0.00
Dakota									
5,500.0	0.00	0.00	5,500.0	0.0	0.0	0.0	0.00	0.00	0.00
5,600.0	0.00	0.00	5,600.0	0.0	0.0	0.0	0.00	0.00	0.00
5,700.0	0.00	0.00	5,700.0	0.0	0.0	0.0	0.00	0.00	0.00
5,800.0	0.00	0.00	5,800.0	0.0	0.0	0.0	0.00	0.00	0.00
5,900.0	0.00	0.00	5,900.0	0.0	0.0	0.0	0.00	0.00	0.00
6,000.0	0.00	0.00	6,000.0	0.0	0.0	0.0	0.00	0.00	0.00
6,100.0	0.00	0.00	6,100.0	0.0	0.0	0.0	0.00	0.00	0.00
6,101.0	0.00	0.00	6,101.0	0.0	0.0	0.0	0.00	0.00	0.00
9-5/8" Dakota Casing									
6,200.0	0.00	0.00	6,200.0	0.0	0.0	0.0	0.00	0.00	0.00
6,300.0	0.00	0.00	6,300.0	0.0	0.0	0.0	0.00	0.00	0.00
6,400.0	0.00	0.00	6,400.0	0.0	0.0	0.0	0.00	0.00	0.00
6,402.0	0.00	0.00	6,402.0	0.0	0.0	0.0	0.00	0.00	0.00
Rierdon									
6,500.0	0.00	0.00	6,500.0	0.0	0.0	0.0	0.00	0.00	0.00
6,600.0	0.00	0.00	6,600.0	0.0	0.0	0.0	0.00	0.00	0.00
6,700.0	0.00	0.00	6,700.0	0.0	0.0	0.0	0.00	0.00	0.00
6,740.0	0.00	0.00	6,740.0	0.0	0.0	0.0	0.00	0.00	0.00
Dunham Salt									
6,800.0	0.00	0.00	6,800.0	0.0	0.0	0.0	0.00	0.00	0.00
6,851.0	0.00	0.00	6,851.0	0.0	0.0	0.0	0.00	0.00	0.00
Dunham Salt Base									
6,900.0	0.00	0.00	6,900.0	0.0	0.0	0.0	0.00	0.00	0.00
6,948.0	0.00	0.00	6,948.0	0.0	0.0	0.0	0.00	0.00	0.00
Spearfish									
7,000.0	0.00	0.00	7,000.0	0.0	0.0	0.0	0.00	0.00	0.00
7,100.0	0.00	0.00	7,100.0	0.0	0.0	0.0	0.00	0.00	0.00
7,200.0	0.00	0.00	7,200.0	0.0	0.0	0.0	0.00	0.00	0.00
7,203.0	0.00	0.00	7,203.0	0.0	0.0	0.0	0.00	0.00	0.00
Pine Salt									
7,251.0	0.00	0.00	7,251.0	0.0	0.0	0.0	0.00	0.00	0.00
Pine Salt Base									
7,296.0	0.00	0.00	7,296.0	0.0	0.0	0.0	0.00	0.00	0.00
Opeche Salt									
7,300.0	0.00	0.00	7,300.0	0.0	0.0	0.0	0.00	0.00	0.00
7,326.0	0.00	0.00	7,326.0	0.0	0.0	0.0	0.00	0.00	0.00
Opeche Salt Base									
7,400.0	0.00	0.00	7,400.0	0.0	0.0	0.0	0.00	0.00	0.00
7,500.0	0.00	0.00	7,500.0	0.0	0.0	0.0	0.00	0.00	0.00
7,528.0	0.00	0.00	7,528.0	0.0	0.0	0.0	0.00	0.00	0.00

Database:	EDM_new	Local Co-ordinate Reference:	Well Kline Federal 5300 31-18 7T2
Company:	Oasis	TVD Reference:	WELL @ 2033.0usft (Original Well Elev)
Project:	Indian Hills	MD Reference:	WELL @ 2033.0usft (Original Well Elev)
Site:	153N-100W-17/18	North Reference:	True
Well:	Kline Federal 5300 31-18 7T2	Survey Calculation Method:	Minimum Curvature
Wellbore:	Kline Federal 5300 31-18 7T2		
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)
Broom Creek (Top of Minnelusa Gp.)									
7,600.0	0.00	0.00	7,600.0	0.0	0.0	0.0	0.00	0.00	0.00
7,608.0	0.00	0.00	7,608.0	0.0	0.0	0.0	0.00	0.00	0.00
Amsden									
7,700.0	0.00	0.00	7,700.0	0.0	0.0	0.0	0.00	0.00	0.00
7,776.0	0.00	0.00	7,776.0	0.0	0.0	0.0	0.00	0.00	0.00
Tyler									
7,800.0	0.00	0.00	7,800.0	0.0	0.0	0.0	0.00	0.00	0.00
7,900.0	0.00	0.00	7,900.0	0.0	0.0	0.0	0.00	0.00	0.00
7,967.0	0.00	0.00	7,967.0	0.0	0.0	0.0	0.00	0.00	0.00
Otter (Base of Minnelusa Gp.)									
8,000.0	0.00	0.00	8,000.0	0.0	0.0	0.0	0.00	0.00	0.00
8,100.0	0.00	0.00	8,100.0	0.0	0.0	0.0	0.00	0.00	0.00
8,200.0	0.00	0.00	8,200.0	0.0	0.0	0.0	0.00	0.00	0.00
8,300.0	0.00	0.00	8,300.0	0.0	0.0	0.0	0.00	0.00	0.00
8,322.0	0.00	0.00	8,322.0	0.0	0.0	0.0	0.00	0.00	0.00
Kibbey									
8,400.0	0.00	0.00	8,400.0	0.0	0.0	0.0	0.00	0.00	0.00
8,472.0	0.00	0.00	8,472.0	0.0	0.0	0.0	0.00	0.00	0.00
Charles Salt									
8,500.0	0.00	0.00	8,500.0	0.0	0.0	0.0	0.00	0.00	0.00
8,600.0	0.00	0.00	8,600.0	0.0	0.0	0.0	0.00	0.00	0.00
8,700.0	0.00	0.00	8,700.0	0.0	0.0	0.0	0.00	0.00	0.00
8,800.0	0.00	0.00	8,800.0	0.0	0.0	0.0	0.00	0.00	0.00
8,900.0	0.00	0.00	8,900.0	0.0	0.0	0.0	0.00	0.00	0.00
9,000.0	0.00	0.00	9,000.0	0.0	0.0	0.0	0.00	0.00	0.00
9,096.0	0.00	0.00	9,096.0	0.0	0.0	0.0	0.00	0.00	0.00
UB									
9,100.0	0.00	0.00	9,100.0	0.0	0.0	0.0	0.00	0.00	0.00
9,171.0	0.00	0.00	9,171.0	0.0	0.0	0.0	0.00	0.00	0.00
Base Last Salt									
9,200.0	0.00	0.00	9,200.0	0.0	0.0	0.0	0.00	0.00	0.00
9,219.0	0.00	0.00	9,219.0	0.0	0.0	0.0	0.00	0.00	0.00
Ratcliffe									
9,300.0	0.00	0.00	9,300.0	0.0	0.0	0.0	0.00	0.00	0.00
9,400.0	0.00	0.00	9,400.0	0.0	0.0	0.0	0.00	0.00	0.00
9,405.0	0.00	0.00	9,405.0	0.0	0.0	0.0	0.00	0.00	0.00
Mission Canyon									
9,500.0	0.00	0.00	9,500.0	0.0	0.0	0.0	0.00	0.00	0.00
9,600.0	0.00	0.00	9,600.0	0.0	0.0	0.0	0.00	0.00	0.00
9,700.0	0.00	0.00	9,700.0	0.0	0.0	0.0	0.00	0.00	0.00
9,800.0	0.00	0.00	9,800.0	0.0	0.0	0.0	0.00	0.00	0.00
9,900.0	0.00	0.00	9,900.0	0.0	0.0	0.0	0.00	0.00	0.00
9,967.0	0.00	0.00	9,967.0	0.0	0.0	0.0	0.00	0.00	0.00
Lodgepole									
10,000.0	0.00	0.00	10,000.0	0.0	0.0	0.0	0.00	0.00	0.00
10,100.0	0.00	0.00	10,100.0	0.0	0.0	0.0	0.00	0.00	0.00
10,173.0	0.00	0.00	10,173.0	0.0	0.0	0.0	0.00	0.00	0.00
Lodgepole Fracture Zone									
10,200.0	0.00	0.00	10,200.0	0.0	0.0	0.0	0.00	0.00	0.00
10,300.0	0.00	0.00	10,300.0	0.0	0.0	0.0	0.00	0.00	0.00
10,335.5	0.00	0.00	10,335.5	0.0	0.0	0.0	0.00	0.00	0.00

Database:	EDM_new	Local Co-ordinate Reference:	Well Kline Federal 5300 31-18 7T2
Company:	Oasis	TVD Reference:	WELL @ 2033.0usft (Original Well Elev)
Project:	Indian Hills	MD Reference:	WELL @ 2033.0usft (Original Well Elev)
Site:	153N-100W-17/18	North Reference:	True
Well:	Kline Federal 5300 31-18 7T2	Survey Calculation Method:	Minimum Curvature
Wellbore:	Kline Federal 5300 31-18 7T2		
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)
KOP Build 12°/100'									
10,400.0	7.74	123.55	10,399.8	-2.4	3.6	3.6	12.00	12.00	0.00
10,500.0	19.74	123.55	10,496.8	-15.5	23.4	23.4	12.00	12.00	0.00
10,600.0	31.74	123.55	10,586.7	-39.5	59.5	59.5	12.00	12.00	0.00
10,696.4	43.31	123.55	10,663.0	-71.9	108.4	108.4	12.00	12.00	0.00
False Bakken									
10,700.0	43.74	123.55	10,665.6	-73.2	110.4	110.4	12.00	12.00	0.00
10,710.3	44.98	123.55	10,673.0	-77.2	116.4	116.4	12.00	12.00	0.00
Upper Bakken									
10,730.6	47.41	123.55	10,687.0	-85.3	128.6	128.6	12.00	12.00	0.00
Middle Bakken									
10,800.0	55.74	123.55	10,730.1	-115.3	173.9	173.9	12.00	12.00	0.00
10,803.4	56.14	123.55	10,732.0	-116.9	176.2	176.2	12.00	12.00	0.00
Lower Bakken									
10,829.6	59.29	123.55	10,746.0	-129.1	194.7	194.7	12.00	12.00	0.00
Pronghorn									
10,854.1	62.24	123.55	10,758.0	-141.0	212.6	212.6	12.00	12.00	0.00
Three Forks 1st Bench									
10,900.0	67.74	123.55	10,777.4	-163.9	247.2	247.2	12.00	12.00	0.00
10,909.8	68.92	123.55	10,781.0	-169.0	254.8	254.8	12.00	12.00	0.00
Three Forks 1st Bench Claystone									
10,936.8	72.16	123.55	10,790.0	-183.0	276.0	276.0	12.00	12.00	0.00
Three Forks 2nd Bench									
11,000.0	79.74	123.55	10,805.3	-216.9	327.0	327.0	12.00	12.00	0.00
11,083.8	89.80	123.55	10,813.0	-262.9	396.5	396.5	12.00	12.00	0.00
EOC									
11,084.0	89.80	123.55	10,813.0	-263.0	396.7	396.7	2.00	2.00	0.00
7" Intermediate									
11,100.0	89.80	123.23	10,813.0	-271.9	410.0	410.0	2.02	0.00	-2.02
11,200.0	89.80	121.23	10,813.4	-325.2	494.6	494.6	2.00	0.00	-2.00
11,300.0	89.80	119.23	10,813.7	-375.5	581.0	581.0	2.00	0.00	-2.00
11,400.0	89.79	117.23	10,814.1	-422.8	669.1	669.1	2.00	0.00	-2.00
11,500.0	89.79	115.23	10,814.4	-467.0	758.8	758.8	2.00	0.00	-2.00
11,600.0	89.79	113.23	10,814.8	-508.0	850.0	850.0	2.00	0.00	-2.00
11,700.0	89.79	111.23	10,815.2	-545.9	942.6	942.6	2.00	0.00	-2.00
11,800.0	89.79	109.23	10,815.5	-580.4	1,036.4	1,036.4	2.00	0.00	-2.00
11,900.0	89.79	107.23	10,815.9	-611.7	1,131.4	1,131.4	2.00	0.00	-2.00
12,000.0	89.79	105.23	10,816.3	-639.6	1,227.4	1,227.4	2.00	0.00	-2.00
12,100.0	89.79	103.23	10,816.6	-664.2	1,324.3	1,324.3	2.00	0.00	-2.00
12,200.0	89.79	101.23	10,817.0	-685.4	1,422.0	1,422.0	2.00	0.00	-2.00
12,300.0	89.79	99.23	10,817.3	-703.1	1,520.5	1,520.5	2.00	0.00	-2.00
12,400.0	89.79	97.23	10,817.7	-717.5	1,619.4	1,619.4	2.00	0.00	-2.00
12,481.2	89.80	95.60	10,818.0	-726.5	1,700.1	1,700.1	2.00	0.00	-2.00
Three Forks 2nd Bench Claystone									
12,500.0	89.80	95.23	10,818.1	-728.3	1,718.8	1,718.8	2.00	0.00	-2.00
12,600.0	89.80	93.23	10,818.4	-735.7	1,818.5	1,818.5	2.00	0.00	-2.00
12,700.0	89.80	91.23	10,818.8	-739.6	1,918.5	1,918.5	2.00	0.00	-2.00
12,761.3	89.80	90.00	10,819.0	-740.2	1,979.8	1,979.8	2.00	0.00	-2.00
12,800.0	89.80	90.00	10,819.1	-740.2	2,018.5	2,018.5	0.00	0.00	0.00
12,900.0	89.80	90.00	10,819.5	-740.2	2,118.5	2,118.5	0.00	0.00	0.00
13,000.0	89.80	90.00	10,819.8	-740.2	2,218.5	2,218.5	0.00	0.00	0.00
13,100.0	89.80	90.00	10,820.2	-740.2	2,318.5	2,318.5	0.00	0.00	0.00

Database:	EDM_new	Local Co-ordinate Reference:	Well Kline Federal 5300 31-18 7T2
Company:	Oasis	TVD Reference:	WELL @ 2033.0usft (Original Well Elev)
Project:	Indian Hills	MD Reference:	WELL @ 2033.0usft (Original Well Elev)
Site:	153N-100W-17/18	North Reference:	True
Well:	Kline Federal 5300 31-18 7T2	Survey Calculation Method:	Minimum Curvature
Wellbore:	Kline Federal 5300 31-18 7T2		
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)
13,200.0	89.80	90.00	10,820.5	-740.2	2,418.5	2,418.5	0.00	0.00	0.00
13,300.0	89.80	90.00	10,820.9	-740.2	2,518.5	2,518.5	0.00	0.00	0.00
13,400.0	89.80	90.00	10,821.2	-740.2	2,618.5	2,618.5	0.00	0.00	0.00
13,500.0	89.80	90.00	10,821.6	-740.2	2,718.5	2,718.5	0.00	0.00	0.00
13,600.0	89.80	90.00	10,821.9	-740.2	2,818.5	2,818.5	0.00	0.00	0.00
13,700.0	89.80	90.00	10,822.3	-740.2	2,918.5	2,918.5	0.00	0.00	0.00
13,800.0	89.80	90.00	10,822.6	-740.2	3,018.4	3,018.4	0.00	0.00	0.00
13,900.0	89.80	90.00	10,823.0	-740.2	3,118.4	3,118.4	0.00	0.00	0.00
14,000.0	89.80	90.00	10,823.3	-740.2	3,218.4	3,218.4	0.00	0.00	0.00
14,100.0	89.80	90.00	10,823.7	-740.2	3,318.4	3,318.4	0.00	0.00	0.00
14,200.0	89.80	90.00	10,824.0	-740.2	3,418.4	3,418.4	0.00	0.00	0.00
14,300.0	89.80	90.00	10,824.4	-740.2	3,518.4	3,518.4	0.00	0.00	0.00
14,400.0	89.80	90.00	10,824.7	-740.2	3,618.4	3,618.4	0.00	0.00	0.00
14,500.0	89.80	90.00	10,825.1	-740.2	3,718.4	3,718.4	0.00	0.00	0.00
14,600.0	89.80	90.00	10,825.4	-740.2	3,818.4	3,818.4	0.00	0.00	0.00
14,700.0	89.80	90.00	10,825.8	-740.2	3,918.4	3,918.4	0.00	0.00	0.00
14,800.0	89.80	90.00	10,826.1	-740.2	4,018.4	4,018.4	0.00	0.00	0.00
14,900.0	89.80	90.00	10,826.5	-740.2	4,118.4	4,118.4	0.00	0.00	0.00
15,000.0	89.80	90.00	10,826.8	-740.2	4,218.4	4,218.4	0.00	0.00	0.00
15,100.0	89.80	90.00	10,827.2	-740.2	4,318.4	4,318.4	0.00	0.00	0.00
15,200.0	89.80	90.00	10,827.5	-740.2	4,418.4	4,418.4	0.00	0.00	0.00
15,300.0	89.80	90.00	10,827.9	-740.2	4,518.4	4,518.4	0.00	0.00	0.00
15,400.0	89.80	90.00	10,828.2	-740.2	4,618.4	4,618.4	0.00	0.00	0.00
15,500.0	89.80	90.00	10,828.6	-740.2	4,718.4	4,718.4	0.00	0.00	0.00
15,600.0	89.80	90.00	10,828.9	-740.2	4,818.4	4,818.4	0.00	0.00	0.00
15,700.0	89.80	90.00	10,829.2	-740.2	4,918.4	4,918.4	0.00	0.00	0.00
15,800.0	89.80	90.00	10,829.6	-740.2	5,018.4	5,018.4	0.00	0.00	0.00
15,900.0	89.80	90.00	10,829.9	-740.2	5,118.4	5,118.4	0.00	0.00	0.00
16,000.0	89.80	90.00	10,830.3	-740.2	5,218.4	5,218.4	0.00	0.00	0.00
16,100.0	89.80	90.00	10,830.6	-740.2	5,318.4	5,318.4	0.00	0.00	0.00
16,200.0	89.80	90.00	10,831.0	-740.2	5,418.4	5,418.4	0.00	0.00	0.00
16,300.0	89.80	90.00	10,831.3	-740.2	5,518.4	5,518.4	0.00	0.00	0.00
16,400.0	89.80	90.00	10,831.7	-740.2	5,618.4	5,618.4	0.00	0.00	0.00
16,500.0	89.80	90.00	10,832.0	-740.2	5,718.4	5,718.4	0.00	0.00	0.00
16,600.0	89.80	90.00	10,832.4	-740.2	5,818.4	5,818.4	0.00	0.00	0.00
16,700.0	89.80	90.00	10,832.7	-740.2	5,918.4	5,918.4	0.00	0.00	0.00
16,800.0	89.80	90.00	10,833.1	-740.2	6,018.4	6,018.4	0.00	0.00	0.00
16,900.0	89.80	90.00	10,833.4	-740.2	6,118.4	6,118.4	0.00	0.00	0.00
17,000.0	89.80	90.00	10,833.8	-740.2	6,218.4	6,218.4	0.00	0.00	0.00
17,100.0	89.80	90.00	10,834.1	-740.2	6,318.4	6,318.4	0.00	0.00	0.00
17,200.0	89.80	90.00	10,834.5	-740.2	6,418.4	6,418.4	0.00	0.00	0.00
17,300.0	89.80	90.00	10,834.8	-740.2	6,518.4	6,518.4	0.00	0.00	0.00
17,400.0	89.80	90.00	10,835.2	-740.2	6,618.4	6,618.4	0.00	0.00	0.00
17,500.0	89.80	90.00	10,835.5	-740.2	6,718.4	6,718.4	0.00	0.00	0.00
17,600.0	89.80	90.00	10,835.9	-740.2	6,818.4	6,818.4	0.00	0.00	0.00
17,700.0	89.80	90.00	10,836.2	-740.2	6,918.4	6,918.4	0.00	0.00	0.00
17,800.0	89.80	90.00	10,836.6	-740.2	7,018.4	7,018.4	0.00	0.00	0.00
17,900.0	89.80	90.00	10,836.9	-740.2	7,118.4	7,118.4	0.00	0.00	0.00
18,000.0	89.80	90.00	10,837.3	-740.2	7,218.4	7,218.4	0.00	0.00	0.00
18,100.0	89.80	90.00	10,837.6	-740.2	7,318.4	7,318.4	0.00	0.00	0.00
18,200.0	89.80	90.00	10,838.0	-740.2	7,418.4	7,418.4	0.00	0.00	0.00
18,207.1	89.80	90.00	10,838.0	-740.2	7,425.5	7,425.5	0.00	0.00	0.00
Three Forks 3rd Bench									
18,300.0	89.80	90.00	10,838.3	-740.2	7,518.4	7,518.4	0.00	0.00	0.00

Database:	EDM_new	Local Co-ordinate Reference:	Well Kline Federal 5300 31-18 7T2
Company:	Oasis	TVD Reference:	WELL @ 2033.0usft (Original Well Elev)
Project:	Indian Hills	MD Reference:	WELL @ 2033.0usft (Original Well Elev)
Site:	153N-100W-17/18	North Reference:	True
Well:	Kline Federal 5300 31-18 7T2	Survey Calculation Method:	Minimum Curvature
Wellbore:	Kline Federal 5300 31-18 7T2		
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)
18,400.0	89.80	90.00	10,838.7	-740.2	7,618.4	7,618.4	0.00	0.00	0.00
18,500.0	89.80	90.00	10,839.0	-740.2	7,718.4	7,718.4	0.00	0.00	0.00
18,600.0	89.80	90.00	10,839.4	-740.2	7,818.4	7,818.4	0.00	0.00	0.00
18,700.0	89.80	90.00	10,839.7	-740.2	7,918.4	7,918.4	0.00	0.00	0.00
18,800.0	89.80	90.00	10,840.1	-740.2	8,018.4	8,018.4	0.00	0.00	0.00
18,900.0	89.80	90.00	10,840.4	-740.2	8,118.4	8,118.4	0.00	0.00	0.00
19,000.0	89.80	90.00	10,840.8	-740.2	8,218.4	8,218.4	0.00	0.00	0.00
19,100.0	89.80	90.00	10,841.1	-740.2	8,318.4	8,318.4	0.00	0.00	0.00
19,200.0	89.80	90.00	10,841.5	-740.2	8,418.4	8,418.4	0.00	0.00	0.00
19,300.0	89.80	90.00	10,841.8	-740.2	8,518.4	8,518.4	0.00	0.00	0.00
19,400.0	89.80	90.00	10,842.2	-740.2	8,618.4	8,618.4	0.00	0.00	0.00
19,500.0	89.80	90.00	10,842.5	-740.2	8,718.4	8,718.4	0.00	0.00	0.00
19,600.0	89.80	90.00	10,842.9	-740.2	8,818.4	8,818.4	0.00	0.00	0.00
19,700.0	89.80	90.00	10,843.2	-740.2	8,918.4	8,918.4	0.00	0.00	0.00
19,800.0	89.80	90.00	10,843.6	-740.2	9,018.4	9,018.4	0.00	0.00	0.00
19,900.0	89.80	90.00	10,843.9	-740.2	9,118.4	9,118.4	0.00	0.00	0.00
20,000.0	89.80	90.00	10,844.3	-740.2	9,218.4	9,218.4	0.00	0.00	0.00
20,100.0	89.80	90.00	10,844.6	-740.2	9,318.4	9,318.4	0.00	0.00	0.00
20,200.0	89.80	90.00	10,845.0	-740.2	9,418.4	9,418.4	0.00	0.00	0.00
20,300.0	89.80	90.00	10,845.3	-740.2	9,518.4	9,518.4	0.00	0.00	0.00
20,400.0	89.80	90.00	10,845.7	-740.2	9,618.4	9,618.4	0.00	0.00	0.00
20,500.0	89.80	90.00	10,846.0	-740.2	9,718.4	9,718.4	0.00	0.00	0.00
20,600.0	89.80	90.00	10,846.4	-740.2	9,818.4	9,818.4	0.00	0.00	0.00
20,700.0	89.80	90.00	10,846.7	-740.2	9,918.4	9,918.4	0.00	0.00	0.00
20,800.0	89.80	90.00	10,847.1	-740.2	10,018.4	10,018.4	0.00	0.00	0.00
20,831.6	89.80	90.00	10,847.2	-740.2	10,050.0	10,050.0	0.00	0.00	0.00
Kline Federal 5300 31-18 7T2 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
Kline Federal 5300 31 - plan misses target center by 0.2usft at 20831.6usft MD (10847.2 TVD, -740.2 N, 10050.0 E) - Point	0.00	0.00	10,847.2	-740.0	10,050.0	406,045.00	1,220,101.75	48° 4' 20.510 N	103° 33' 43.389 W

Casing Points

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
2,023.0	2,023.0	13-3/8" Surface	13-3/8	17-1/2
6,101.0	6,101.0	9-5/8" Dakota Casing	9-5/8	12-1/4
11,084.0	10,813.0	7" Intermediate	7	8-3/4

Database:	EDM_new	Local Co-ordinate Reference:	Well Kline Federal 5300 31-18 7T2
Company:	Oasis	TVD Reference:	WELL @ 2033.0usft (Original Well Elev)
Project:	Indian Hills	MD Reference:	WELL @ 2033.0usft (Original Well Elev)
Site:	153N-100W-17/18	North Reference:	True
Well:	Kline Federal 5300 31-18 7T2	Survey Calculation Method:	Minimum Curvature
Wellbore:	Kline Federal 5300 31-18 7T2		
Design:	Design #1		

Formations

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
1,923.0	1,923.0	Pierre			
4,570.0	4,570.0	Greenhorn			
4,976.0	4,976.0	Mowry			
5,403.0	5,403.0	Dakota			
6,402.0	6,402.0	Rierdon			
6,740.0	6,740.0	Dunham Salt			
6,851.0	6,851.0	Dunham Salt Base			
6,948.0	6,948.0	Spearfish			
7,203.0	7,203.0	Pine Salt			
7,251.0	7,251.0	Pine Salt Base			
7,296.0	7,296.0	Opeche Salt			
7,326.0	7,326.0	Opeche Salt Base			
7,528.0	7,528.0	Broom Creek (Top of Minnelusa Gp.			
7,608.0	7,608.0	Amsden			
7,776.0	7,776.0	Tyler			
7,967.0	7,967.0	Otter (Base of Minnelusa Gp.)			
8,322.0	8,322.0	Kibbey			
8,472.0	8,472.0	Charles Salt			
9,096.0	9,096.0	UB			
9,171.0	9,171.0	Base Last Salt			
9,219.0	9,219.0	Ratcliffe			
9,405.0	9,405.0	Mission Canyon			
9,967.0	9,967.0	Lodgepole			
10,173.0	10,173.0	Lodgepole Fracture Zone			
10,696.4	10,663.0	False Bakken			
10,710.3	10,673.0	Upper Bakken			
10,730.6	10,687.0	Middle Bakken			
10,803.4	10,732.0	Lower Bakken			
10,829.6	10,746.0	Pronghorn			
10,854.1	10,758.0	Three Forks 1st Bench			
10,909.8	10,781.0	Three Forks 1st Bench Claystone			
10,936.8	10,790.0	Three Forks 2nd Bench			
12,481.2	10,818.0	Three Forks 2nd Bench Claystone			
18,207.1	10,838.0	Three Forks 3rd Bench			

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	Local Coordinates +E/-W (usft)	Comment
10,335.5	10,335.5	0.0	0.0	KOP Build 12°/100'
11,083.8	10,813.0	-262.9	396.5	EOC

Project: Indian Hills
Site: 153N-100W-17/18
Well: Kline Federal 5300 31-18 7T2
Wellbore: Kline Federal 5300 31-18 7T2
Design: Design #1

OASIS PETROLEUM

WELL DETAILS: Kline Federal 5300 31-18 7T2

Ground Level: 2008.0

Northing	Easting	Latitude	Longitude
407189.34	1210089.73	48° 4' 27.840 N	103° 36' 11.380 W

CASING DETAILS

TVD	MD	Name	Size
2023.0	2023.0	Surface	13-3/8
6101.0	6101.0	Dakota Casing	9-5/8
10813.0	11084.0	Intermediate	7

Azimuths to True North
Magnetic North: 8.27°

Magnetic Field
Strength: 56438.2snT
Dip Angle: 72.99°
Date: 5/28/2014
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	
10335.5	0.00	0.00	10335.5	0.0	0.0	0.00	
11083.8	89.80	123.55	10813.0	-263.0	396.5	12.00	
12761.3	89.80	90.00	10819.0	-740.2	1979.8	2.00	
20831.6	89.80	90.00	10847.2	-740.2	10050.0	0.00	PBHL

DRILLING PLAN

OPERATOR	Oasis Petroleum	**COUNTY/STATE**	McKenzie Co., ND
WELL NAME	Kline Federal 5300 31-18 7T2	**RIG**	0
WELL TYPE	Horizontal Three Forks		
LOCATION	NWSW 18-153N-100W Surface Location (survey plat): 2490' fsl 238' fwl		
EST. T.D.	20,832'	**GROUND ELEV:**	2008 Finished Pad Elev. **Sub Height:** 25
	TOTAL LATERAL: 9,748' (est)	**KB ELEV:**	2033

PROGNOSIS: Based on 2,033' KB(est)

MARKER		DEPTH (Surf Loc)	DATUM (Surf Loc)
Pierre	NDIC MAP	1,923	110'
Greenhorn		4,570	-2,537'
Mowry		4,976	-2,943'
Dakota		5,403	-3,370'
Rierdon		6,402	-4,369'
Dunham Salt		6,740	-4,707'
Dunham Salt Base		6,851	-4,818'
Spearfish		6,948	-4,915'
Pine Salt		7,203	-5,170'
Pine Salt Base		7,251	-5,218'
Opeche Salt		7,296	-5,263'
Opeche Salt Base		7,326	-5,293'
Broom Creek (Top of Minnelusa Gp)		7,528	-5,495'
Amsden		7,608	-5,575'
Tyler		7,776	-5,743'
Otter (Base of Minnelusa Gp)		7,967	-5,934'
Kibbey		8,322	-6,289'
Charles Salt		8,472	-6,439'
UB		9,096	-7,063'
Base Last Salt		9,171	-7,138'
Ratcliffe		9,219	-7,186'
Mission Canyon		9,405	-7,372'
Lodgepole		9,967	-7,934'
Lodgepole Fracture Zone		10,173	-8,140'
False Bakken		10,663	-8,630'
Upper Bakken		10,673	-8,640'
Middle Bakken		10,687	-8,654'
Lower Bakken		10,732	-8,699'
Pronghorn		10,746	-8,713'
Three Forks 1st Bench		10,758	-8,725'
Three Forks 1st Bench Claystone		10,781	-8,748'
Three Forks 2nd Bench		10,790	-8,757'
Three Forks 2nd Bench Claystone		10,818	-8,785'
Three Forks 3rd Bench		10,838	-8,805'

Dip Rate: 0.2

Max. Anticipated BHP: 4688

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: 8,272'
~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' -	2,023'	FW/Gel - Lime Sweeps	8.4-9.0	28-32	NC	Circ Mud Tanks
Intermediate:	2,023' -	11,084'	Invert	9.5-10.4	40-50	30+HtHp	Circ Mud Tanks
Lateral:	11,084' -	20,832'	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"	2,023'		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#	8.75"	11,084'		3,903'	24	1500' above Dakota
Production Liner:	4.5"	13.5#	6"	20,832'	TOL @ 10,285'			50' above KOP

PROBABLE PLUGS, IF REQ'D:

OTHER:

	MD	TVD	FNL/FSL	FEL/FWL	S-T-R	AZI
Surface:	2,023	2,023	2490' FSL	238' FWL	SEC 18-T153N-R100W	Survey Company:
KOP:	10,336'	10,336'	2490' FSL	238' FWL	SEC 18-T153N-R100W	Build Rate: 12 deg /100'
EOC:	11,084'	10,813'	2227' FSL	635' FWL	SEC 18-T153N-R100W	123.55
Casing Point:	11,084'	10,813'	2227' FSL	635' FWL	SEC 18-T153N-R100W	123.55
Three Forks Lateral TD:	20,832'	10,847'	1750' FSL	200' FEL	SEC 17-T153N-R100W	90.00

Comments:

Request Sundry to Waive Open Hole Logs
Exception well: Oasis Petroleum's Kline 5300 11-18H

Completion Notes: 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 5/8/14 **Engineering:** hlbader rpm 7/18/14

Oasis Petroleum
Well Summary
Kline Federal 5300 31-18 7T2
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 2,023'	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 2,023'	13-3/8", 54.5#, J-55, STC, 8rd	1130 / 1.19	2730 / 2.88	514 / 2.61

API Rating & Safety Factor

a) Based on full casing evacuation with 9 ppg fluid on backside (2,023' setting depth).

b) Burst pressure based on 9 ppg fluid with no fluid on backside (2,023' setting depth).

c) Based on string weight in 9 ppg fluid at 2,023' TVD plus 100k# overpull. (Buoyed weight equals 95k 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 7T2
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 31-18 7T2
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' – 6,590'	29	P-110	LTC	6.184"	6.059"	5,980	7,970	9,960
7"	6,590' – 10,336'	32	HCP-110	LTC	6.094"	6.000***	6,730	8,970	11,210
7"	10,336' – 11,084'	29	P-110	LTC	6.184"	6.059"	5,980	7,970	9,960

***Special drift

Interval	Length	Description	Collapse	Burst	Tension
			(psi) a	(psi) b	(1000 lbs) c
0' – 6,590'	6,590'	7", 29#, P-110, LTC, 8rd	8530 / 2.48*	11220 / 1.19	797 / 2.08
6,590' – 10,336'	3,746'	7", 32#, HCP-110, LTC, 8rd	11820 / 2.19*	12460 / 1.29	
6,590' – 10,336'	3,746'	7", 32#, HCP-110, LTC, 8rd	11820 / 1.08**	12460 / 1.29	
10,336' – 11,084'	748'	7", 29 lb, P-110, LTC, 8rd	8530 / 1.51*	11220 / 1.15	

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 10,813' TVD.

c) Based on string weight in 10 ppg fluid, (282k 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: **177 sks** (81 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: **624 sks** (172 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 31-18 7T2
Section 18 T153N R100W
McKenzie County, ND

PRODUCTION LINER

Size	Interval	Weight	Grade	Coupling	I.D.	Drift	Estimated Torque
4-1/2"	10,286' – 20,832'	13.5	P-110	BTC	3.92"	3.795"	4,500

Interval	Description	Collapse	Burst	Tension
		(psi) **a**	(psi) **b**	(1000 lbs) **c**
10,286' – 20,832'	4-1/2", 13.5 lb, P-110, BTC, 8rd	10680 / 1.99	12410 / 1.28	443 / 1.99

API Rating & Safety Factor

a) Based on full casing evacuation with 9.5 ppg fluid on backside @ 10,847' TVD.

b) Burst pressure based on 9000 psi treating pressure with 10.2 ppg internal fluid gradient and 9 ppg external fluid gradient @ 10,847' TVD.

c) Based on string weight in 9.5 ppg fluid (Buoyed weight: 121k 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)

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

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

Date: **7/7/2014**

RE: CORES AND SAMPLES

Well Name: **KLINE FEDERAL 5300 31-18 7T2** Well File No.: **28755**
Location: **LOT3 18-153-100** County: MCKENZIE
Permit Type: **Development - HORIZONTAL**
Field: **BAKER** Target Horizon: THREE FORKS B2

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. 28755

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

☑ Notice of Intent	Approximate Start Date: June 15, 2014	☐ Drilling Prognosis	☐ Spill Report
☐ Report of Work Done	Date Work Completed	☐ 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.	Approximate Start Date	☐ Supplemental History	☐ Change Production Method
		☐ Temporarily Abandon	☐ Reclamation
		☑ Other	Variance to Rule 43-02-03-31

Well Name and Number					
Kline Federal 5300 31-18 7T2					
Footages	Qtr-Qtr	Section	Township	Range	
2490 F S L 238 F W L	Lot 3	18	153 N	100 W	
Field	Pool	County			
Baker	2nd Bench Three Forks	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 rule 43-02-03-31 requiring electrical, radioactive or other similar logs to be run to determine formation tops and zones of porosity. The surface location of this well will be very near our Kline Federal 5300 11-18H (API #33-053-03426 NDIC # 20275) in Lot 1, Section 18, T153N, R100W and the logs run on this well should be sufficient to determine formation tops in the vertical section of the well bore. As outlined in our application for permit to drill, Oasis Petroleum North America, LLC will run gamma ray logs from KOP to the total depth and cement bond log from the production casing total depth to surface. Two digital copies of all mud logs (one tif and one las) will be submitted to the NDIC.

Approved per #20275

Company: Oasis Petroleum North America, LLC		Telephone Number: (281) 404-9562
Address: 1001 Fannin, Suite 1500		
City: Houston	State: TX	Zip Code: 77002
Signature: [signature]	Printed Name: Lauri M. Stanfield	
Title: Regulatory Specialist	Date: May 30, 2014	
Email Address: lstanfield@oasispetroleum.com		

FOR STATE USE ONLY

☐ Received	☒ Approved
Date: 6-30-2014	
By: [signature]	
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. 28755

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

☑ Notice of Intent	Approximate Start Date **June 15, 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	**NDAC 43-02-03-55 Waiver**

Well Name and Number				
Kline Federal 5300 31-18 7T2				
Footages	Qtr-Qtr	Section	Township	Range
2490 F S L 238 F W L	**Lot 3**	**18**	**153 N**	**100 W**
Field	Pool	County		
Baker	**2nd Bench Three Forks**	**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 requests permission for suspension of drilling for up to 90 days for the referenced well under NDAC 43-02-03-55. Oasis 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 understands NDAC 43-02-03-31 requirements regarding confidentiality pertaining to this permit. The lined reserve pit will be fenced immediately after construction if the well pad is located in a pasture (NDAC 43-02-03-19 & 19.1). Oasis 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.

Company **Oasis Petroleum North America, LLC**			Telephone Number **(281) 404-9562**
Address **1001 Fannin, Suite 1500**			
City **Houston**		State **TX**	Zip Code **77002**
Signature	Printed Name **Lauri M. Stanfield**		
Title **Regulatory Specialist**	Date **May 30, 2014**		
Email Address **lstanfield@oasispetroleum.com**			

FOR STATE USE ONLY

☐ Received	☒ Approved
Date 6/30/14	
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 30, 2014

Lauri M. Stanfield
Regulatory Specialist
OASIS PETROLEUM NORTH AMERICA LLC
1001 Fannin Street Suite 1500
Houston, TX 77002

RE: HORIZONTAL WELL
KLINE FEDERAL 5300 31-18 7T2
LOT3 Section 18-153N-100W
McKenzie County
Well File # 28755

Dear Lauri:

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 17 & 18 T153N R100W.

PERMIT STIPULATIONS: 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. Due to the proximity of Lake Sakakawea to the well site, a dike is required surrounding the entire location. 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: 10051' 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	06 / 15 / 2014	No

Operator	Telephone Number
OASIS PETROLEUM NORTH AMERICA LLC	281-404-9562

Address	City	State	Zip Code
1001 Fannin Street 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 31-18 7T2

Surface Footages	Qtr-Qtr	Section	Township	Range	County
2490 F S L 238 F W L	LOT3	18	153 N	100 W	McKenzie

Longstring Casing Point Footages	Qtr-Qtr	Section	Township	Range	County
2227 F S L 635 F W L	LOT3	18	153 N	100 W	McKenzie

Longstring Casing Point Coordinates From Well Head	Azimuth	Longstring Total Depth
263 S From WH 397 E From WH	124 °	11084 Feet MD 10813 Feet TVD

Bottom Hole Footages From Nearest Section Line	Qtr-Qtr	Section	Township	Range	County
1750 F S L 201 F E L	NESE	17	153 N	100 W	McKenzie

Bottom Hole Coordinates From Well Head	KOP Lateral 1	Azimuth Lateral 1	Estimated Total Depth Lateral 1
740 S From WH 10050 E From WH	10336 Feet MD	90 °	20832 Feet MD 10847 Feet TVD

Latitude of Well Head	Longitude of Well Head	NAD Reference	Description of (Subject to NDIC Approval)
48 ° 04 ' 27.84 "	-103 ° 36 ' 11.38 "	NAD83	Spacing Unit: Sections 17 & 18 T153N R100W

Ground Elevation	Acres in Spacing/Drilling Unit	Spacing/Drilling Unit Setback Requirement	Industrial Commission Order
2018 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
10545 Feet	10489 Feet	5244 Feet	5257 Feet

Objective Horizons	Pierre Shale Top
Three Forks B2	1923

Proposed	Size	Weight	Depth	Cement Volume	
Surface Casing	9 - 5/8 "	36 Lb./Ft.	2023 Feet	736 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 - "	32 Lb./Ft.	11084 Feet MD 10813 Feet TVD	766 Sacks	3903 Feet	5403 Feet

Base Last Charles Salt (If Applicable)	
9171 Feet	NOTE: Intermediate or longstring casing string must be cemented above the top Dakota Group Sand.

Proposed Logs
Triple Combo: KOP to Kibbey 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

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 05 / 30 / 2014
ePermit	Printed Name Lauri M. Stanfield	Title Regulatory Specialist

FOR STATE USE ONLY

Permit and File Number 28755	API Number 33 - 053 - 06056
Field BAKER	
Pool BAKKEN	Permit Type DEVELOPMENT

FOR STATE USE ONLY

Date Approved 6 / 30 / 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 31-18 7T2"
2490 FEET FROM SOUTH LINE AND 238 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 DARYL D. KASEMAN, PLS, REGISTRATION NUMBER 3880 ON 4/25/14 AND THE ORIGINAL DOCUMENTS ARE STORED AT THE OFFICES OF INTERSTATE ENGINEERING, INC.

0 1000
1" = 1000'

✠ ⧗ – MONUMENT – RECOVERED
✠ ⧗ – MONUMENT – NOT RECOVERED

STAKED ON 4/23/14
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.

DARYL D. KASEMAN LS-3880

REGISTERED LAND SURVEYOR
DARYL D. KASEMAN
LS-3880
DATE: 4/25/14
NORTH DAKOTA

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Revision No.	Date	By	Description

O:\Work\Eng\Oasis\100.01 Oasis Petroleum - Kline Federal 5300 31-18 7T2 on 1Grid Plat\CAD\Kline Federal 5300 31-18 7T2.dwg - 4/25/2014 10:58 AM jeph schreiner

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

Drawn By: B.H.H. | Project No.: S14-09-109.01
Checked By: D.D.K. | 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

INTERSTATE ENGINEERING
Professionals you need, people you trust

DRILLING PLAN

OPERATOR	Oasis Petroleum	**COUNTY/STATE**	McKenzie Co., ND
WELL NAME	Kline Federal 5300 31-18 7T2	**RIG**	0
WELL TYPE	Horizontal Three Forks		
LOCATION	NWSW 18-153N-100W Surface Location (survey plat): 2490' fsl	238' fwl	
EST. T.D.	20,832'	**GROUND ELEV:**	2008 Finished Pad Elev. **Sub Height:** 25
	TOTAL LATERAL: 9,748' (est)	**KB ELEV:**	2033

PROGNOSIS: Based on 2,033' KB(est)

MARKER		DEPTH (Surf Loc)	DATUM (Surf Loc)
Pierre	NDIC MAP	1,923	110'
Greenhorn		4,570	-2,537'
Mowry		4,976	-2,943'
Dakota		5,403	-3,370'
Rierdon		6,402	-4,369'
Dunham Salt		6,740	-4,707'
Dunham Salt Base		6,851	-4,818'
Spearfish		6,948	-4,915'
Pine Salt		7,203	-5,170'
Pine Salt Base		7,251	-5,218'
Opeche Salt		7,296	-5,263'
Opeche Salt Base		7,326	-5,293'
Broom Creek (Top of Minnelusa Gp.)		7,528	-5,495'
Amsden		7,608	-5,575'
Tyler		7,776	-5,743'
Otter (Base of Minnelusa Gp.)		7,967	-5,934'
Kibbey		8,322	-6,289'
Charles Salt		8,472	-6,439'
UB		9,096	-7,063'
Base Last Salt		9,171	-7,138'
Ratcliffe		9,219	-7,186'
Mission Canyon		9,405	-7,372'
Lodgepole		9,967	-7,934'
Lodgepole Fracture Zone		10,173	-8,140'
False Bakken		10,663	-8,630'
Upper Bakken		10,673	-8,640'
Middle Bakken		10,687	-8,654'
Lower Bakken		10,732	-8,699'
Pronghorn		10,746	-8,713'
Three Forks 1st Bench		10,758	-8,725'
Three Forks 1st Bench Claystone		10,781	-8,748'
Three Forks 2nd Bench		10,790	-8,757'
Three Forks 2nd Bench Claystone		10,818	-8,785'
Three Forks 3rd Bench		10,838	-8,805'

Dip Rate: -0.2

Max. Anticipated BHP: 4688

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: 8,272' ~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' -	2,023'	FW/Gel - Lime Sweeps	8.4-9.0	28-32	NC	Circ Mud Tanks
Intermediate:	2,023' -	11,084'	Invert	9.5-10.4	40-50	30+HtHp	Circ Mud Tanks
Lateral:	11,084' -	20,832'	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#	13.5"	2,023'		To Surface	12	100' into Pierre
Intermediate:	7"	29#	8.75"	11,084'		3,903'	24	500' above Dakota
Production Liner:	4.5"	13.5#	6"	20,832'	TOL @ 10,286'			50' above KOP

PROBABLE PLUGS, IF REQ'D:

OTHER:

	MD	TVD	FNL/FSL	FEL/FWL	S-T-R	AZI
Surface:	2,023	2,023	2490' FSL	238' FWL	SEC 18-T153N-R100W	Survey Company:
KOP:	10,336'	10,336'	2490' FSL	238' FWL	SEC 18-T153N-R100W	Build Rate: 12 deg /100'
EOC:	11,084'	10,813'	2227' FSL	635' FWL	SEC 18-T153N-R100W	123.55
Casing Point:	11,084'	10,813'	2227' FSL	635' FWL	SEC 18-T153N-R100W	123.55
Three Forks Lateral TD:	20,832'	10,847'	1750' FSL	200' FEL	SEC 17-T153N-R100W	90.00

Comments:

Request Sundry to Waive Open Hole Logs

Exception well: Oasis Petroleum's Kline 5300 11-18H

Completion Notes: 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 5/8/14 **Engineering:** hlbader rpm 5/29/14

Oasis Petroleum
Well Summary
Kline Federal 5300 31-18 7T2
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 2,023’	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 2,023’	9-5/8", 36#, J-55, LTC, 8rd	2020 / 2.13	3520 / 3.72	453 / 2.78	

API Rating & Safety Factor

a) Based on full casing evacuation with 9 ppg fluid on backside (2,023' setting depth).

b) Burst pressure based on 9 ppg fluid with no fluid on backside (2,023' setting depth).

c) Based on string weight in 9 ppg fluid at 2,023' TVD plus 100k# overpull. (Buoyed weight equals 63k 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: **436 sks** (225 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 31-18 7T2
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' – 6,540'	29	P-110	LTC	6.184”	6.059”	5,980	7,970	8,770
7”	6,540' – 10,336'	32	HCP-110	LTC	6.094”	6.000***	6,730	8,970	9,870
7”	10,336' – 11,084'	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' – 6,540'	6,540’	7”, 29#, P-110, LTC, 8rd	8530 / 2.51*	11220 / 1.19	797 / 2.09
6,540' – 10,336'	3,796’	7”, 32#, HCP-110, LTC, 8rd	11820 / 2.20*	12460 / 1.29	
6,540' – 10,336'	3,796’	7”, 32#, HCP-110, LTC, 8rd	11820 / 1.07**	12460 / 1.29	
10,336' – 11,084'	748’	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. (Bottom of last salt 9,171’ 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 10,813' TVD.

c) Based on string weight in 10 ppg fluid, (282k 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: **589 sks** (172 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 31-18 7T2
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”	10,286' – 20,832'	11.6	P-110	BTC	4.000"	3.875"			

Interval	Description	Collapse	Burst	Tension	Cost per ft
		(psi) **a**	(psi) **b**	(1000 lbs) **c**	
10,286' – 20,832'	4-1/2”, 11.6 lb, P-110, BTC, 8rd	7560 / 1.42	10690 / 1.10	385 / 1.88	

API Rating & Safety Factor

a) Based on full casing evacuation with 9.5 ppg fluid on backside @ 10,813' TVD.

b) Burst pressure based on 9000 psi treating pressure with 10.2 ppg internal fluid gradient and 9 ppg external fluid gradient @ 10,813' TVD.

c) Based on string weight in 9.5 ppg fluid (Buoyed weight: 105k lbs.) plus 100k lbs overpull.

Project: Indian Hills
Site: 153N-100W-17/18
Well: Kline Federal 5300 31-18 7T2
Wellbore: Kline Federal 5300 31-18 7T2
Design: Design #1

OASIS PETROLEUM

WELL DETAILS: Kline Federal 5300 31-18 7T2

Ground Level: 2008.0

Northing	Easting	Latitude	Longitude
407189.34	1210089.73	48° 4' 27.840 N	103° 36' 11.380 W

CASING DETAILS

TVD	MD	Name	Size
10813.0	11084.0	7"	7

Azimuths to True North
Magnetic North: 8.27°

Magnetic Field
Strength: 56438.2snT
Dip Angle: 72.99°
Date: 5/28/2014
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	
10335.5	0.00	0.00	10335.5	0.0	0.0	0.00	
11083.8	89.80	123.55	10813.0	-263.0	396.5	12.00	
12761.3	89.80	90.00	10819.0	-740.2	1979.8	2.00	
20831.6	89.80	90.00	10847.2	-740.2	10050.0	0.00	5300 31-18 7T2 PBHL

Oasis

Indian Hills
153N-100W-17/18
Kline Federal 5300 31-18 7T2

Kline Federal 5300 31-18 7T2

Plan: Design #1

Standard Planning Report

30 May, 2014

Planning Report

Database:	edm	**Local Co-ordinate Reference:**	Well Kline Federal 5300 31-18 7T2
Company:	Oasis	**TVD Reference:**	WELL @ 2033.0usft (Original Well Elev)
Project:	Indian Hills	**MD Reference:**	WELL @ 2033.0usft (Original Well Elev)
Site:	153N-100W-17/18	**North Reference:**	True
Well:	Kline Federal 5300 31-18 7T2	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Kline Federal 5300 31-18 7T2		
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 31-18 7T2

Well Position	**+N/-S**	-1,777.3 usft	**Northing:**	407,189.33 usft	**Latitude:**	48° 4' 27.840 N
	+E/-W	-67.9 usft	**Easting:**	1,210,089.73 usft	**Longitude:**	103° 36' 11.380 W
Position Uncertainty		2.0 usft	**Wellhead Elevation:**		**Ground Level:**	2,008.0 usft

Wellbore Kline Federal 5300 31-18 7T2

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	5/28/2014	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	
10,335.5	0.00	0.00	10,335.5	0.0	0.0	0.00	0.00	0.00	0.00	
11,083.8	89.80	123.55	10,813.0	-263.0	396.5	12.00	12.00	0.00	123.55	
12,761.3	89.80	90.00	10,819.0	-740.2	1,979.8	2.00	0.00	-2.00	-90.06	
20,831.6	89.80	90.00	10,847.2	-740.2	10,050.0	0.00	0.00	0.00	0.00	5300 31-18 7T2 PB

Database:	edm	**Local Co-ordinate Reference:**	Well Kline Federal 5300 31-18 7T2
Company:	Oasis	**TVD Reference:**	WELL @ 2033.0usft (Original Well Elev)
Project:	Indian Hills	**MD Reference:**	WELL @ 2033.0usft (Original Well Elev)
Site:	153N-100W-17/18	**North Reference:**	True
Well:	Kline Federal 5300 31-18 7T2	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Kline Federal 5300 31-18 7T2		
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)
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00
500.0	0.00	0.00	500.0	0.0	0.0	0.0	0.00	0.00	0.00
1,000.0	0.00	0.00	1,000.0	0.0	0.0	0.0	0.00	0.00	0.00
1,500.0	0.00	0.00	1,500.0	0.0	0.0	0.0	0.00	0.00	0.00
1,923.0	0.00	0.00	1,923.0	0.0	0.0	0.0	0.00	0.00	0.00
Pierre									
2,000.0	0.00	0.00	2,000.0	0.0	0.0	0.0	0.00	0.00	0.00
2,500.0	0.00	0.00	2,500.0	0.0	0.0	0.0	0.00	0.00	0.00
3,000.0	0.00	0.00	3,000.0	0.0	0.0	0.0	0.00	0.00	0.00
3,500.0	0.00	0.00	3,500.0	0.0	0.0	0.0	0.00	0.00	0.00
4,000.0	0.00	0.00	4,000.0	0.0	0.0	0.0	0.00	0.00	0.00
4,500.0	0.00	0.00	4,500.0	0.0	0.0	0.0	0.00	0.00	0.00
4,570.0	0.00	0.00	4,570.0	0.0	0.0	0.0	0.00	0.00	0.00
Greenhorn									
4,976.0	0.00	0.00	4,976.0	0.0	0.0	0.0	0.00	0.00	0.00
Mowry									
5,000.0	0.00	0.00	5,000.0	0.0	0.0	0.0	0.00	0.00	0.00
5,403.0	0.00	0.00	5,403.0	0.0	0.0	0.0	0.00	0.00	0.00
Dakota									
5,500.0	0.00	0.00	5,500.0	0.0	0.0	0.0	0.00	0.00	0.00
6,000.0	0.00	0.00	6,000.0	0.0	0.0	0.0	0.00	0.00	0.00
6,402.0	0.00	0.00	6,402.0	0.0	0.0	0.0	0.00	0.00	0.00
Rierdon									
6,500.0	0.00	0.00	6,500.0	0.0	0.0	0.0	0.00	0.00	0.00
6,740.0	0.00	0.00	6,740.0	0.0	0.0	0.0	0.00	0.00	0.00
Dunham Salt									
6,851.0	0.00	0.00	6,851.0	0.0	0.0	0.0	0.00	0.00	0.00
Dunham Salt Base									
6,948.0	0.00	0.00	6,948.0	0.0	0.0	0.0	0.00	0.00	0.00
Spearfish									
7,000.0	0.00	0.00	7,000.0	0.0	0.0	0.0	0.00	0.00	0.00
7,203.0	0.00	0.00	7,203.0	0.0	0.0	0.0	0.00	0.00	0.00
Pine Salt									
7,251.0	0.00	0.00	7,251.0	0.0	0.0	0.0	0.00	0.00	0.00
Pine Salt Base									
7,296.0	0.00	0.00	7,296.0	0.0	0.0	0.0	0.00	0.00	0.00
Opeche Salt									
7,326.0	0.00	0.00	7,326.0	0.0	0.0	0.0	0.00	0.00	0.00
Opeche Salt Base									
7,500.0	0.00	0.00	7,500.0	0.0	0.0	0.0	0.00	0.00	0.00
7,528.0	0.00	0.00	7,528.0	0.0	0.0	0.0	0.00	0.00	0.00
Broom Creek (Top of Minnelusa Gp.)									
7,608.0	0.00	0.00	7,608.0	0.0	0.0	0.0	0.00	0.00	0.00
Amsden									
7,776.0	0.00	0.00	7,776.0	0.0	0.0	0.0	0.00	0.00	0.00
Tyler									
7,967.0	0.00	0.00	7,967.0	0.0	0.0	0.0	0.00	0.00	0.00
Otter (Base of Minnelusa Gp.)									
8,000.0	0.00	0.00	8,000.0	0.0	0.0	0.0	0.00	0.00	0.00
8,322.0	0.00	0.00	8,322.0	0.0	0.0	0.0	0.00	0.00	0.00
Kibbey									
8,472.0	0.00	0.00	8,472.0	0.0	0.0	0.0	0.00	0.00	0.00

Database:	edm	**Local Co-ordinate Reference:**	Well Kline Federal 5300 31-18 7T2
Company:	Oasis	**TVD Reference:**	WELL @ 2033.0usft (Original Well Elev)
Project:	Indian Hills	**MD Reference:**	WELL @ 2033.0usft (Original Well Elev)
Site:	153N-100W-17/18	**North Reference:**	True
Well:	Kline Federal 5300 31-18 7T2	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Kline Federal 5300 31-18 7T2		
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)
Charles Salt									
8,500.0	0.00	0.00	8,500.0	0.0	0.0	0.0	0.00	0.00	0.00
9,000.0	0.00	0.00	9,000.0	0.0	0.0	0.0	0.00	0.00	0.00
9,096.0	0.00	0.00	9,096.0	0.0	0.0	0.0	0.00	0.00	0.00
UB									
9,171.0	0.00	0.00	9,171.0	0.0	0.0	0.0	0.00	0.00	0.00
Base Last Salt									
9,219.0	0.00	0.00	9,219.0	0.0	0.0	0.0	0.00	0.00	0.00
Ratcliffe									
9,405.0	0.00	0.00	9,405.0	0.0	0.0	0.0	0.00	0.00	0.00
Mission Canyon									
9,500.0	0.00	0.00	9,500.0	0.0	0.0	0.0	0.00	0.00	0.00
9,967.0	0.00	0.00	9,967.0	0.0	0.0	0.0	0.00	0.00	0.00
Lodgepole									
10,000.0	0.00	0.00	10,000.0	0.0	0.0	0.0	0.00	0.00	0.00
10,173.0	0.00	0.00	10,173.0	0.0	0.0	0.0	0.00	0.00	0.00
Lodgepole Fracture Zone									
10,335.5	0.00	0.00	10,335.5	0.0	0.0	0.0	0.00	0.00	0.00
KOP Build 12°/100'									
10,500.0	19.74	123.55	10,496.8	-15.5	23.4	23.4	12.00	12.00	0.00
10,696.4	43.31	123.55	10,663.0	-71.9	108.4	108.4	12.00	12.00	0.00
False Bakken									
10,710.3	44.98	123.55	10,673.0	-77.2	116.4	116.4	12.00	12.00	0.00
Upper Bakken									
10,730.6	47.41	123.55	10,687.0	-85.3	128.6	128.6	12.00	12.00	0.00
Middle Bakken									
10,803.4	56.14	123.55	10,732.0	-116.9	176.2	176.2	12.00	12.00	0.00
Lower Bakken									
10,829.6	59.29	123.55	10,746.0	-129.1	194.7	194.7	12.00	12.00	0.00
Pronghorn									
10,854.1	62.24	123.55	10,758.0	-141.0	212.6	212.6	12.00	12.00	0.00
Three Forks 1st Bench									
10,909.8	68.92	123.55	10,781.0	-169.0	254.8	254.8	12.00	12.00	0.00
Three Forks 1st Bench Claystone									
10,936.8	72.16	123.55	10,790.0	-183.0	276.0	276.0	12.00	12.00	0.00
Three Forks 2nd Bench									
11,000.0	79.74	123.55	10,805.3	-216.9	327.0	327.0	12.00	12.00	0.00
11,083.8	89.80	123.55	10,813.0	-262.9	396.5	396.5	12.00	12.00	0.00
EOC									
11,084.0	89.80	123.55	10,813.0	-263.0	396.7	396.7	2.00	2.00	0.00
7"									
11,500.0	89.79	115.23	10,814.4	-467.0	758.8	758.8	2.00	0.00	-2.00
12,000.0	89.79	105.23	10,816.3	-639.6	1,227.4	1,227.4	2.00	0.00	-2.00
12,481.2	89.80	95.60	10,818.0	-726.5	1,700.1	1,700.1	2.00	0.00	-2.00
Three Forks 2nd Bench Claystone									
12,500.0	89.80	95.23	10,818.1	-728.3	1,718.8	1,718.8	2.00	0.00	-2.00
12,761.3	89.80	90.00	10,819.0	-740.2	1,979.8	1,979.8	2.00	0.00	-2.00
13,000.0	89.80	90.00	10,819.8	-740.2	2,218.5	2,218.5	0.00	0.00	0.00
13,500.0	89.80	90.00	10,821.6	-740.2	2,718.5	2,718.5	0.00	0.00	0.00
14,000.0	89.80	90.00	10,823.3	-740.2	3,218.4	3,218.4	0.00	0.00	0.00
14,500.0	89.80	90.00	10,825.1	-740.2	3,718.4	3,718.4	0.00	0.00	0.00

Database:	edm	**Local Co-ordinate Reference:**	Well Kline Federal 5300 31-18 7T2
Company:	Oasis	**TVD Reference:**	WELL @ 2033.0usft (Original Well Elev)
Project:	Indian Hills	**MD Reference:**	WELL @ 2033.0usft (Original Well Elev)
Site:	153N-100W-17/18	**North Reference:**	True
Well:	Kline Federal 5300 31-18 7T2	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Kline Federal 5300 31-18 7T2		
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)
15,000.0	89.80	90.00	10,826.8	-740.2	4,218.4	4,218.4	0.00	0.00	0.00
15,500.0	89.80	90.00	10,828.6	-740.2	4,718.4	4,718.4	0.00	0.00	0.00
16,000.0	89.80	90.00	10,830.3	-740.2	5,218.4	5,218.4	0.00	0.00	0.00
16,500.0	89.80	90.00	10,832.0	-740.2	5,718.4	5,718.4	0.00	0.00	0.00
17,000.0	89.80	90.00	10,833.8	-740.2	6,218.4	6,218.4	0.00	0.00	0.00
17,500.0	89.80	90.00	10,835.5	-740.2	6,718.4	6,718.4	0.00	0.00	0.00
18,000.0	89.80	90.00	10,837.3	-740.2	7,218.4	7,218.4	0.00	0.00	0.00
18,207.1	89.80	90.00	10,838.0	-740.2	7,425.5	7,425.5	0.00	0.00	0.00
Three Forks 3rd Bench									
18,500.0	89.80	90.00	10,839.0	-740.2	7,718.4	7,718.4	0.00	0.00	0.00
19,000.0	89.80	90.00	10,840.8	-740.2	8,218.4	8,218.4	0.00	0.00	0.00
19,500.0	89.80	90.00	10,842.5	-740.2	8,718.4	8,718.4	0.00	0.00	0.00
20,000.0	89.80	90.00	10,844.3	-740.2	9,218.4	9,218.4	0.00	0.00	0.00
20,831.6	89.80	90.00	10,847.2	-740.2	10,050.0	10,050.0	0.00	0.00	0.00
5300 31-18 7T2 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 31-18 7T2 PBHL	0.00	0.00	10,847.2	-740.0	10,050.0	406,045.00	1,220,101.75	48° 4' 20.510 N	103° 33' 43.389 W
- plan misses target center by 0.2usft at 20831.6usft MD (10847.2 TVD, -740.2 N, 10050.0 E)									
- Point									

Casing Points

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
11,084.0	10,813.0	7"	7	8-3/4

Database:	edm	**Local Co-ordinate Reference:**	Well Kline Federal 5300 31-18 7T2
Company:	Oasis	**TVD Reference:**	WELL @ 2033.0usft (Original Well Elev)
Project:	Indian Hills	**MD Reference:**	WELL @ 2033.0usft (Original Well Elev)
Site:	153N-100W-17/18	**North Reference:**	True
Well:	Kline Federal 5300 31-18 7T2	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Kline Federal 5300 31-18 7T2		
Design:	Design #1		

Formations

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
1,923.0	1,923.0	Pierre			
4,570.0	4,570.0	Greenhorn			
4,976.0	4,976.0	Mowry			
5,403.0	5,403.0	Dakota			
6,402.0	6,402.0	Rierdon			
6,740.0	6,740.0	Dunham Salt			
6,851.0	6,851.0	Dunham Salt Base			
6,948.0	6,948.0	Spearfish			
7,203.0	7,203.0	Pine Salt			
7,251.0	7,251.0	Pine Salt Base			
7,296.0	7,296.0	Opeche Salt			
7,326.0	7,326.0	Opeche Salt Base			
7,528.0	7,528.0	Broom Creek (Top of Minnelusa Gp.			
7,608.0	7,608.0	Amsden			
7,776.0	7,776.0	Tyler			
7,967.0	7,967.0	Otter (Base of Minnelusa Gp.)			
8,322.0	8,322.0	Kibbey			
8,472.0	8,472.0	Charles Salt			
9,096.0	9,096.0	UB			
9,171.0	9,171.0	Base Last Salt			
9,219.0	9,219.0	Ratcliffe			
9,405.0	9,405.0	Mission Canyon			
9,967.0	9,967.0	Lodgepole			
10,173.0	10,173.0	Lodgepole Fracture Zone			
10,696.4	10,663.0	False Bakken			
10,710.3	10,673.0	Upper Bakken			
10,730.6	10,687.0	Middle Bakken			
10,803.4	10,732.0	Lower Bakken			
10,829.6	10,746.0	Pronghorn			
10,854.1	10,758.0	Three Forks 1st Bench			
10,909.8	10,781.0	Three Forks 1st Bench Claystone			
10,936.8	10,790.0	Three Forks 2nd Bench			
12,481.2	10,818.0	Three Forks 2nd Bench Claystone			
18,207.1	10,838.0	Three Forks 3rd Bench			

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	Local Coordinates +E/-W (usft)	Comment
10,335.5	10,335.5	0.0	0.0	KOP Build 12°/100'
11,083.8	10,813.0	-262.9	396.5	EOC

WELL LOCATION PLAT

OASIS PETROLEUM NORTH AMERICA, LLC
1001 FANNIN, SUITE 1500, HOUSTON, TX 77002
"KLINE FEDERAL 5300 31-18 7T2"
2490 FEET FROM SOUTH LINE AND 238 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 DARYL D. KASEMAN, PLS, REGISTRATION NUMBER 3880 ON 4/25/14 AND THE ORIGINAL DOCUMENTS ARE STORED AT THE OFFICES OF INTERSTATE ENGINEERING, INC.

0 1000
1" = 1000'

✠ ⧗ – MONUMENT – RECOVERED
✠ ⧗ – MONUMENT – NOT RECOVERED

STAKED ON 4/23/14
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.

DARYL D. KASEMAN LS-3880

REGISTERED LAND SURVEYOR
DARYL D. KASEMAN
LS-3880
DATE: 4/25/14
NORTH DAKOTA

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Revision No.	Date	By	Description

O:\Work\Eng\Oasis\100.01 Oasis Petroleum - Kline Federal 5300 31-18 7T2 on 1Grid Plat\CAD\Kline Federal 5300 31-18 7T2.dwg - 4/25/2014 10:58 AM jeph schreiner

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

Drawn By: B.H.H. | Project No.: S14-09-109.01
Checked By: D.D.K. | Date: APRIL 2014

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

INTERSTATE ENGINEERING
Professionals you need, people you trust

SECTION BREAKDOWN

OASIS PETROLEUM NORTH AMERICA, LLC
1001 FANNIN, SUITE 1500, HOUSTON, TX 77002
"KLINE FEDERAL 5300 31-18 7T2"
2490 FEET FROM SOUTH LINE AND 238 FEET FROM WEST LINE
SECTIONS 17 & 18, T153N, R100W, 5th P.M., MCKENZIE COUNTY, NORTH DAKOTA

– MONUMENT – RECOVERED

– MONUMENT – NOT RECOVERED

THIS DOCUMENT WAS ORIGINALLY ISSUED AND SEALED BY DARYL D. KASEMAN, PLS, REGISTRATION NUMBER 3880 ON 4/25/14 AND THE ORIGINAL DOCUMENTS ARE STORED AT THE OFFICES OF INTERSTATE ENGINEERING, INC.

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'.

REGISTERED LAND SURVEYOR
DARYL D. KASEMAN
LS-3880
DATE: 4/25/14
NORTH DAKOTA

VICINITY MAP

Revision No.	Date	By	Description

G:\Work\Oasis Petroleum - Kline Federal 5300 31-18 7T2 on Pipe Pad\CAD\Kline Federal 5300 31-18 7T2.dwg -- 4/25/2014 10:58 AM Jeph schmierer

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

Drawn By: B.H.H. Project No.: S14-09-109.01
Checked By: D.D.K. Date: APRIL 2014

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PAD LAYOUT

OASIS PETROLEUM NORTH AMERICA, LLC
1001 FANNIN, SUITE 1500, HOUSTON, TX 77002
"KLINE FEDERAL 5300 31-18 7T2"
2490 FEET FROM SOUTH LINE AND 238 FEET FROM WEST LINE
SECTION 18, T153N, R100W, 5TH P.M., MCKENZIE COUNTY, NORTH DAKOTA

THIS DOCUMENT WAS ORIGINALLY ISSUED AND SEALED BY DARYL D. KASEMAN, PLS, REGISTRATION NUMBER 3880 ON 4/25/14 AND THE ORIGINAL DOCUMENTS ARE STORED AT THE OFFICES OF INTERSTATE ENGINEERING, INC.

REGISTERED LAND SURVEYOR
DARYL D. KASEMAN
LS-3880
DATE: 4/25/14
NORTH DAKOTA

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

V-DITCH DETAIL

Proposed Contours — BERM
Original Contours — DITCH

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

0 80
1" = 80'

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

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WELL LOCATION SITE QUANTITIES

OASIS PETROLEUM NORTH AMERICA, LLC
1001 FANNIN, SUITE 1500, HOUSTON, TX 77002
"KLINE FEDERAL 5300 31-18 7T2"
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WELL SITE ELEVATION	2018.2
WELL PAD ELEVATION	2008.0

EXCAVATION	146,179
PLUS PIT	0
	146,179
EMBANKMENT	113,287
PLUS SHRINKAGE (25%)	28,322
	141,609
STOCKPILE PIT	0
STOCKPILE TOP SOIL (6")	4,701
BERMS	1,076 LF = 349 CY
DITCHES	1,350 LF = 207 CY
DETENTION AREA	1,238 CY
STOCKPILE MATERIAL	965
DISTURBED AREA FROM PAD	5.83 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
2490' FSL
238' FWL

BERM DETAIL

DITCH DETAIL

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

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CROSS SECTIONS

OASIS PETROLEUM NORTH AMERICA, LLC
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SECTION 18, T153N, R100W, 5th P.M., MCKENZIE COUNTY, NORTH DAKOTA

STA. 4+00

STA. 5+00

STA. 3+00

STA. 2+00

STA. 0+00

STA. 1+00

REGISTERED LAND SURVEYOR
DARYL D. KASEMAN
LS-3880
DATE: 4/25/14
NORTH DAKOTA

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SCALE
HORIZ 1"=160'
VERT 1"=40'

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CROSS SECTIONS
SECTION 18, T153N, R100W

MKENZIE COUNTY, NORTH DAKOTA

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ACCESS APPROACH

OASIS PETROLEUM NORTH AMERICA, LLC
1001 FANNIN, SUITE 1500, HOUSTON, TX 77002
"KLINE FEDERAL 5300 31-18 7T2"
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0 500
1" = 500'

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

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ACCESS APPROACH
SECTION 18, T153N, R100W

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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

OASIS PETROLEUM NORTH AMERICA, LLC
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SCALE: 1" = 2 MILE

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OASIS PETROLEUM NORTH AMERICA, LLC
COUNTY ROAD MAP
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MCKENZIE COUNTY, NORTH DAKOTA

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OASIS PETROLEUM

STATEMENT

This statement is being sent in order to comply with NDAC 43-02-03-16 (Application for permit to drill and recomplete) which states (in part that) "confirmation that a legal street address has been requested for the well site, and well facility if separate from the well site, and the proposed road access to the nearest existing public road". On the date noted below a legal street address was requested from the appropriate county office.

McKenzie County
Aaron Chisholm – GIS Specialist for McKenzie County

Kline Federal 5300 31-18 6B – 153-100W-17/18 – 05/30/2014
Kline Federal 5300 31-18 7T2 – 153-100W-17/18 – 05/30/2014
Kline Federal 5300 31-18 8T – 153-100W-17/18 – 05/30/2014

Lauri M. Stanfield
Regulatory Specialist
Oasis Petroleum North America, LLC