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
OCT 20 2016
ND Oil & Gas Division

Well File No. **28754**

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: **September 22, 2016**
- [ ] Notice of Intent to Begin a Workover Project that may Qualify for a Tax Exemption Pursuant to NDCC Section 57-51.1-03. — Approximate Start Date

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

Well Name and Number					
Kline Federal 5300 31-18 8B					
Footages	Qtr-Qtr	Section	Township	Range	
2523 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 09/22/2016 the above referenced well was converted to rod pump.

End of Tubing: 2-7/8" L-80 tubing @ 9959.56'

Pump: 2-1/2" x 2.0" x 24' insert pump @ 9857.90'

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	**October 19, 2016**	
Email Address		
jswenson@oasispetroleum.com		

FOR STATE USE ONLY

- [x] Received
- [ ] Approved

Date: 10-28-2016

By: Taylor Roth

Title: TAYLOR ROTH
Engineering Technician

SUNDRY NOTICES AND REPORTS ON WELLS - FORM 4

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

Received
MAR 1 2016
ND Oil & Gas Division

Well File No. **28754**

PLEASE READ INSTRUCTIONS BEFORE FILLING OUT FORM.
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- [ ] Notice of Intent — Approximate Start Date
- [x] Report of Work Done — Date Work Completed: **December 1, 2015**
- [ ] Notice of Intent to Begin a Workover Project that may Qualify for a Tax Exemption Pursuant to NDCC Section 57-51.1-03. — Approximate Start Date

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

Well Name and Number					
Kline Federal 5300 31-18 8B					
Footages	Qtr-Qtr	Section	Township	Range	
2523 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 12/01/2015 the above referenced well is on pump.

End of Tubing: 2-7/8" L-80 tubing @ 10075'

Pump: ESP @ 9815.67'

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	**February 19, 2016**	
Email Address		
jswenson@oasispetroleum.com		

FOR STATE USE ONLY

[x] Received	[ ] Approved
Date: 3-9-16	
By:	
Title: JARED THUNE Engineering Technician	

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.
28754
NDIC CTB No.
0

TH

22865/
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 8B	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 20, 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 20, 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 20, 2015
Other Transporters Transporting From This Lease	**% Transported**	**Date Effective**
		September 20, 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

FOR STATE USE ONLY

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

WELL COMPLETION OR RECOMPLETION REPORT - FORM 6

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

OCT 2015 RECEIVED ND OIL & GAS DIVISION

Well File No. **28754**

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 8B**			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
2523 F **S** L **238** F **W** L	**Lot 3**	**18**	**153 N**	**100 W**	**McKenzie**

Spud Date	Date TD Reached	Drilling Contractor and Rig Number	KB Elevation (Ft)	Graded Elevation (Ft)
February 19, 2015	**May 1, 2015**	**Nabors B22**	**2033**	**2008**

Type of Electric and Other Logs Run (See Instructions)
MWD/GR from KOP to TD; CBL from Int. TD to surface

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

Well Bore	String Type	String Size (Inch)	Top Set (MD Ft)	Depth Set (MD Ft)	Hole Size (Inch)	Weight (Lbs/Ft)	Anchor Set (MD Ft)	Packer Set (MD Ft)	Sacks Cement	Top of Cement
Surface Hole	**Surface**	**13 3/8**	**0**	**2110**	**17 1/2**	**54.5**			**1204**	**0**
Vertical Hole	**Intermediate**	**7**	**0**	**11042**	**8 3/4**	**32**			**830**	**2100**
Lateral1	**Liner**	**4 1/2**	**10125**	**20390**	**6**	**13.5**			**503**	**10125**

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	**20395**	**Perforations**	**11042**	**20390**	**10160**		**07/13/2015**			

PRODUCTION

Current Producing Open Hole or Perforated Interval(s), This Completion, Top and Bottom, (MD Ft)	Name of Zone (If Different from Pool Name)
Lateral 1- 11042' to 20390'	

Date Well Completed (SEE INSTRUCTIONS)	Producing Method	Pumping-Size & Type of Pump	Well Status (Producing or Shut-In)
September 20, 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
09/20/2015	**24**	**36 /64**		**1914**	**1474**	**2732**	**41.3 °**	**Sold**

Flowing Tubing Pressure (PSI)	Flowing Casing Pressure (PSI)	Calculated 24-Hour Rate	Oil (Bbls)	Gas (MCF)	Water (Bbls)	Gas-Oil Ratio
	1450		**1914**	**1474**	**2732**	**770**

GEOLOGICAL MARKERS

Formation	MD (Ft)	TVD (Ft)
Dakota	5440	5440
Kibbey Lime	8321	8320
First Charles Salt	8470	8469
UB	9084	9083
Base Last Salt	9148	9147
Ratcliffe	9182	9181
Mission Canyon	9393	9392
Lodgepole	9948	9947
False Bakken	10807	10659
Scallion	10818	10663
Upper Bakken	10835	10671
Middle Bakken	10883	10687
Target		

PLUG BACK INFORMATION

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

CORES CUT

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

Drill Stem Test

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

Well Specific Stimulations

Date Stimulated	Stimulated Formation	Top (Ft)	Bottom (Ft)	Stimulation Stages	Volume	Volume Units
07/13/2015	Bakken	18852	20390	6	19114	Barrels

Type Treatment	Acid %	Lbs Proppant	Maximum Treatment Pressure (PSI)	Maximum Treatment Rate (BBLS/Min)
Sand Frac		577940	8860	36.7

Details
100 Mesh White: 49260
40/70 White: 194740
30/50 White: 333940

Date Stimulated	Stimulated Formation	Top (Ft)	Bottom (Ft)	Stimulation Stages	Volume	Volume Units
07/30/2015	Bakken	11042	18775	30	195370	Barrels

Type Treatment	Acid %	Lbs Proppant	Maximum Treatment Pressure (PSI)	Maximum Treatment Rate (BBLS/Min)
Sand Frac		3540180	9232	75.0

Details
100 Mesh White: 258200
40/70 White: 1289420
30/50 White: 1992560

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

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)

SEP 2015 RECEIVED ND OIL & GAS DIVISION

Well File No. **28754**

PLEASE READ INSTRUCTIONS BEFORE FILLING OUT FORM.
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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 8B**	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
2523 F **S** L **238** F **W** L	**Lot 3**	**18**	**153 N**	**100 W**	**McKenzie**

Spud Date	Date TD Reached	Drilling Contractor and Rig Number	KB Elevation (Ft)	Graded Elevation (Ft)
February 19, 2015	**May 1, 2015**	**Nabors B22**	**2033**	**2008**

Type of Electric and Other Logs Run (See Instructions)
MWD/GR from KOP to TD; CBL from Int. TD to surface

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

Well Bore	String Type	String Size (Inch)	Top Set (MD Ft)	Depth Set (MD Ft)	Hole Size (Inch)	Weight (Lbs/Ft)	Anchor Set (MD Ft)	Packer Set (MD Ft)	Sacks Cement	Top of Cement
Surface Hole	**Surface**	**13 3/8**	**0**	**2110**	**17 1/2**	**54.5**			**1204**	**0**
Vertical Hole	**Intermediate**	**7**	**0**	**11042**	**8 3/4**	**32**			**830**	**2100**
Lateral1	**Liner**	**4 1/2**	**10125**	**20390**	**6**	**13.5**			**503**	**10125**

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	**20395**	**Perforations**			**10160**					

PRODUCTION

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

GEOLOGICAL MARKERS

Formation	MD (Ft)	TVD (Ft)
Dakota	**5440**	**5440**
Kibbey Lime	**8321**	**8320**
First Charles Salt	**8470**	**8469**
UB	**9084**	**9083**
Base Last Salt	**9148**	**9147**
Ratcliffe	**9182**	**9181**
Mission Canyon	**9393**	**9392**
Lodgepole	**9948**	**9947**
False Bakken	**10807**	**10659**
Scallion	**10818**	**10663**
Upper Bakken	**10835**	**10671**
Middle Bakken	**10883**	**10687**
Target		

PLUG BACK INFORMATION

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

CORES CUT

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

Drill Stem Test

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

Well Specific Stimulations

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

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

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

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

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

ADDITIONAL INFORMATION AND/OR LIST OF ATTACHMENTS

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

I hereby swear or affirm that the information provided is true, complete and correct as determined from all available records.	Email Address **jswenson@oasispetroleum.com**	Date **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. **28754**

PLEASE READ INSTRUCTIONS BEFORE FILLING OUT FORM.
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- [x] Notice of Intent — Approximate Start Date: **July 14, 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
- [ ] Spill Report
- [ ] Redrilling or Repair
- [ ] Shooting
- [ ] 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					
Holmes 5501 11-5 3B					
Footages	Qtr-Qtr	Section	Township	Range	
2523 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		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	**July 14, 2015**	
Email Address		
jswenson@oasispetroleum.com		

FOR STATE USE ONLY

[ ] Received	[x] 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 (09-2008)

RECEIVED AUG 12 2015 ND OIL & GAS DIVISION

Well File No. 28754

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 8B					
Footages	Qtr-Qtr	Section	Township	Range	
2523 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 8B

2,523' FSL & 238' FWL
Lot 3 Section 18, T153N, R100W
Baker Field / Middle Bakken Member
McKenzie County, North Dakota

BOTTOM HOLE LOCATION:
165.41' S & 9,951.14' E of surface location or approx.
2,357.59' FSL & 300.10' 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, G. Wayne Peterson,
Zachary Moses
PO Box 80507; Billings, MT 59108
(406) 259-4124
geology@sunburstconsulting.com

WELL EVALUATION

Figure 1. Nabors Drilling rig B22 at the Oasis Petroleum Kline Federal 5300 31-18 8B During April, 2015 in McKenzie County, North Dakota.

INTRODUCTION

The **Oasis Petroleum North America, LLC Kline Federal 5300 31-18 8B** [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 8B is a horizontal Middle Bakken 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 Middle Bakken lateral. The vertical hole was planned to be drilled to approximately 10,221'. The curve would be built at 12 degrees per 100' to land within the Middle Bakken. Directional drilling technologies and geosteering techniques were used to land in the Middle Bakken reservoir and maintain exposure to the ideal target rock. Oasis Petroleum is targeting a silty sandstone facies of the Middle Bakken 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. Gas shows were not present. 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 10,835' MD 10,671' TVD (-8,638' 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 775 units of drilling gas.

The Middle Bakken [Mississippian-Devonian Bakken Formation] was reached at 10,883' MD 10,687' TVD (-8,654' SS) which was 0' low to the Oasis Petroleum NA LLC Kline Federal 5300 31-18 15T. The target zone of the Middle Bakken was to be drilled in a predominately 16 foot zone beginning 12 feet below the Upper Bakken Shale.

Samples in the Middle Bakken were predominantly silty sandstone which was described as light-medium brown, occasional light gray brown, rare light gray in color. It was very fine grained, firm-friable, sub rounded to sub angular, smooth, moderately sorted, calcite cement moderately cemented. A trace of disseminated and nodular pyrite was noted as was occasional intergranular porosity. Also noted was *common light to medium brown spotty to even oil stain*.

Figure 2 & 3. Middle Bakken silty sandstone 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 8B. 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 20 to 31 units were noted, against a 9.4-10.2 lb/gal diesel-invert mud weight. Background concentrations in the lateral ranged from 1,000 to 6,000 units, against a 9.7-10.4 lb/gal saltwater gel drilling fluid. Connection peaks 5,000 to 7,139 units were observed, as were drilling gas shows of 500 units to 6,823 units coinciding with the best shows. Chromatography of gas revealed typical concentrations of methane, ethane and propane characteristic of Middle Bakken Member gas.

Figure 4. Chromatography of a gas sample on the Kline Federal 5300 31-18 8B.

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 1,029' curve was drilled in 26 hours. It was drilled with a bottom hole assembly (BHA) consisting of bit #3, a Security MMD55M PDC bit, attached to a 2.38 degree fixed NOV stage 7/8 5.0 motor and MWD tools. The curve was successfully landed at 11,058' MD and 10,702' TVD, approximately 15' into the Middle Bakken. Seven inch diameter 32# HCP-110 intermediate casing was set to 11,042' MD.

Geologic structure maps of the Kline Federal 5300 31-18 8B 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 a 16 foot zone located approximately 12 feet into the Middle Bakken. 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 of the Kline Federal 5300 31-18 6B (Blue gamma line), Indian Hills Prospect (Oasis). *Due to landing high in target the 6B proved to be more reliable than the target definition seen when landing the 8B.

Steering decisions were made by using gamma markers identified by Oasis representatives. The high gamma (C) in the central portion of the drilling zone was useful in identifying the well-bore

placement in formation. The slightly lower gamma (between B & C) was observed as the well-bore moved to the top of the target zone, followed by lower gamma as the well-bore moved higher, out of the target zone. As the well-bore moved lower in formation, the lower gamma (below D) was seen when at the bottom of the target zone. Samples collected when drilling low in the target zone tended to have a greater concentration of the light gray to gray silty sandstone than did the samples collected when the well-bore was higher in the target zone. This lateral was drilled in a little over 5 days from casing exit to TD, with one necessitated trip at 15,933' for a mud motor failure at which time the bit was replaced. Well site teams worked closely together with directional to maximize penetration rates averaging 200 to 280 feet per hour while rotating, resulting in 3 days of over 2,000' of lateral progress. The well site team was able to keep the well bore in the desired target the entire well. The TD of 20,395' MD was achieved at 10:00 hours CDT April 30, 2015. The wellbore was completed with 100% of the lateral in target, opening 9,353' (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 8B is a successful well in Oasis Petroleum's horizontal Middle Bakken development program in Baker Field. The project was drilled from surface casing to TD in 13.25 days. The TD of 20,395' MD was achieved at 10:00 hours CDT May 1, 2015. The well site team worked together to maintain the well bore in the desired target interval for 100% of the lateral, opening 9,353' of potentially productive reservoir rock.

Samples in the Middle Bakken were predominantly silty sandstone which was described as light-medium brown, occasional light gray brown, rare light gray in color. It was very fine grained, firm-friable, sub rounded to sub angular, smooth, moderately sorted, calcite cement moderately cemented. A trace of disseminated and nodular pyrite was noted as was occasional intergranular porosity. Also noted was *common light to medium brown spotty to even oil stain*.

Hydrocarbon shows on the Kline Federal 5300 31-18 8B 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 Middle Bakken.

The Oasis Petroleum North America, LLC. Kline Federal 5300 31-18 8B awaits completion operations to determine its ultimate production potential.

Respectfully submitted,

Michelle R. Baker
Sunburst Consulting, Inc.
May 5, 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 8B**
API #:	33-053-006055
WELL FILE #:	28754
SURFACE LOCATION:	2,523' FSL & 238' FWL Lot 3 Section 18, T153N, R100W
FIELD/ OBJECTIVE:	Baker Field / Middle Bakken Member
COUNTY, STATE	McKenzie County, North Dakota
BASIN:	Williston
WELL TYPE:	Middle Bakken Member
ELEVATION:	GL: 2,008' KB: 2,033'
SPUD/ RE-ENTRY DATE:	March 19, 2015
BOTTOM HOLE LOCATION:	165.41' S & 9,951.14' E of surface location or approx. 2,357.59' FSL & 300.10' FEL NE SE Sec. 17, T153N, R100W
CLOSURE COORDINATES:	Closure Azimuth: 90.95° Closure Distance: 9,952.51'
TOTAL DEPTH / DATE:	20,395' on April 30, 2015 100% within target interval
TOTAL DRILLING DAYS:	13 days
CONTRACTOR:	Nabors B22

PUMPS:	H&H Triplex (stroke length - 12")
TOOLPUSHERS:	Darren Birkeland, Jessie Tibbits
FIELD SUPERVISORS:	John Gordan, Dan Thompson, Mike Bader, 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: 246 bbls., Salt Water: Not tracked
PROSPECT GEOLOGIST:	Brendan Hargrove
WELLSITE GEOLOGISTS:	Michelle R. Baker, G. Wayne Peterson, Zachary Moses
GEOSTEERING SYSTEM:	Sunburst Digital Wellsite Geological System
ROCK SAMPLING:	30' from 8,240' - 20,395' (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, Mike Bader, Doug Rakstad
MWD:	Ryan Directional Services Mike McCammond, Sammy Hayman

CASING: Surface: 13 3/8" 36# J-55 set to 2,023'

Intermediate: 7" 29# & 32# HCP-110 set to 11,042'

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 8B"
2523 FEET FROM SOUTH LINE AND 238 FEET FROM WEST LINE
SECTION 18, T153N, R100W, 5th P.M., MCKENZIE COUNTY, NORTH DAKOTA

VICINITY MAP

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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

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Revision No.	Date	By	Description
REV 1	1/27/15	DHI	CHANGED WELL NAMES & BHL
REV 2	2/05/15	JLB	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.: 514-09-105.02
Checked By: D.D.K. Date: APRIL 2014

Interstate Engineering, Inc.
P.O. Box 648
425 East Broadway Avenue
Sidney, Montana 59270
Ph. (406) 433-5617
Fax (406) 433-5618
www.interstateeng.com
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SHEET NO.

SECTION BREAKDOWN

OASIS PETROLEUM NORTH AMERICA, LLC
1001 FANNIN, SUITE 1500, HOUSTON, TX 77002
"KLINE FEDERAL 5300 31-18 8B"
2523 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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VICINITY MAP

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REV 2	2/05/15	JS	UPDATED ACCESS ROAD ROUTE

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

Drawn By: BJKH Project No.: S14-05-105.02
Checked By: DJSK Date: APRIL 2014

Interstate Engineering, Inc.
P.O. Box 648
425 East Main Street
Sidney, Montana 59270
Ph (406) 433-5617
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(SHEET NO.)

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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EXISTING CONTOURS
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

Drawn By: B.H.H. Project No.: S14-09-109.02
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	JAS	UPDATED ACCESS ROAD ROUTE

COUNTY ROAD MAP

OASIS PETROLEUM NORTH AMERICA, LLC
1001 FANNIN, SUITE 1500, HOUSTON, TX 77002
"KLINE FEDERAL 5300 31-18 8B"
2523 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.: S14-09-109.02
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

TIME VS. DEPTH

Oasis Petroleum North America, LLC

Kline Federal 5300 31-18 8B

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	3/19	2,023'	-	-	-	-	-	-	-	-	-	-	Skid from Kline Federal 5300 31-18 15T. Rig accepted @ 18:00 on 3/18/2015. Nipple up BOPS. Service rig. Pre job safety with Recon. Test BOPS. Gather BHA. Install wear bushing.	-
1	3/20	5,479'	3,456'	1/2	25	60	-	-	1500	78	78	549	Pick up 12.25" BHA. TIH. Service rig. Drill cement float. Downtime instrumentation. Drill cement shoe track and 17' of new hole. FIT test at 2,148'. TOH. Lay down 12.25" BHA. Pick up 8.75" BHA. Drill and survey 2,149'-5,479'. Service rig.	Rierdon
2	3/21	8,217'	2,738'	2	28	60	-	132	3500	78	78	549	Service top drive. Downtime- top drive. Drill ahead rotating from 5,479'-7,035'. Service top drive. Drill and survey 7,035'-8,217'	Otter
3	3/22	9,710'	1,493'	2	41	40	-	125	3800	74	74	521	Drill and survey 8,217'-9,026'. Service top drive, function upper rams. Drill and survey 9,026'-9,710'.	Mission Canyon
4	3/23	10,029'	319'	2	48	61	-	122	3800	72	72	507	Drill and survey 9,710'-10,029'. TOH, pump dry job. Service top drive. Downtime-top drive oil. Service rig. TOH, remove RHR and install trip nipple. Lay down BHA. Pick up BHA. TIH. Cut drilling line. TIH.	Lodgepole
5	3/24	10,746'	717'	3	25	20	25	160	3600	72	72	553	Cut drilling line. TIH. Reaming/washing salt from 8,530'-8,726'. TIH. Drill and survey from 10,029'-10,160. Trough at 103 degrees. Drill and survey from 10,160'-10,653'. Service top drive, function pipe rams 6 sec. SPR @ 10,653' 40 stks P#1 591, P#2 599. Drill and survey from 10,653'-10,746'.	Lodgepole
6	3/25	11,058'	312'	3	25	20	25	160	3300	72	72	553	Drill and survey curve, sliding as neede, from 10,746'-11,058'. Reach intermediate casing point, land curve. TOOH to start casing operations. Wiper trip/short trip. Circulate and condition. Remove rotating head, install trip nipple. TOOH. Lay down BHA. Rack 3 monels. Install wear bushing, remove wear bushing. Service rig. Rig up casing crew. Hold safety meeting. Run casing. Make up shoe and float. Run casing.	Middle Bakken Member
7	3/26	11,058'	'	-	-	-	-	-	-	-	-	-	Running 7" intermediate casing in the hole. Prepare cement. Break circulation. Run casing. Wash to bottom. Circulate and condition. Rig down casing crew. Rig up cementing crew. Hold safety meeting. Primary cementing. Rig up cement head. Cementing. Rig down cement crew. Nipple down BOPs. Rig down flow line, choke, fill line, unbolt BOP using Weatherford services. Set casing slips. Rig down bell extensions, casing elevators. Cut casing. Install well head. Install nigt cap on well head. Prepare to walk rig. Release rig at 04:00 hours CST on March 26, 2015.	Middle Bakken Member
8	4/25	11,058'	'	-	-	-	-	-	-	-	-	-	Skid rig to Oasis Kline Federal 5300 31-18 8B. Rig accepted at 16:00 hours CDT on April 24, 2015. Nipple up BOPs. Turn buckles on BOP. Rig up catwalk. Install mouse hole. Test BOPs. Test casing. Service top drive and rig. Pick up BHA; lateral assembly. TIH. Drill cement from 10,849'-10,910'. Continue drilling cement out of casing.	Middle Bakken Member

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
9	4/26	13,067'	2,009'	4	14	40	22	254	3800	-	90	317	Drill cement. FIT. Drill out cement at intermediate casing. Drill float @ 10,953', shoe @ 11,042'. FIT test 13 ppg to 1,868 psi; good test. Drill and survey, sliding as needed, from 11,042'-11,563'. Rig service. Drill and survey, sliding as needed, from 11,563'-11,747'. Rig service. BOP drill. Drill and survey, sliding as needed, from 11, 563'-13,067'.	Middle Bakken Member
10	4/27	15,438'	2,371'	4	14	40	30	242	3900	-	86	303	BOP drill. Drill and survey, sliding as needed, from 13,067'-14,205'. Service rig. Drill and survey, sliding as needed, from 14,205'-15,153'. Rig service. Drill and survey, sliding as needed, from 15,153'-15,438'.	Middle Bakken Member
11	4/28	16,007'	569'	4/5	10	30	40	237	3300	-	84	296	Drill and survey, sliding as needed, from 15,438'-15,933'. Circulate and condition, build and pump dry job. TOH for suspected motor failure; stalling out, inadequate returns from slides, diminished ROP. Remove rotating head, install trip nipple. TOH. Laydown BHA. Pick up new BHA. TIH. Slip and cut drill line. TIH. Circulate and condition. Drill and survey, sliding as needed, from 15,933'-16,007'.	Middle Bakken Member
12	4/29	18,093'	2,086'	5	14	40	30	226	3900	-	80	282	Drill and survey, sliding as needed, from 16,007'-16,671'. Service rig. Drill and survey, sliding as needed, from 16,671'-17,524'. Rig service. Drill and survey, sliding as needede, from 17,524'-18,093'.	Middle Bakken Member
13	4/30	20,083'	1,990'	5	17	40	23	220	3900	-	78	275	Drill and survey, sliding as needed, from 18,093'-18,851'. Service rig. Drill and survey, sliding as needed, from 18,851'-19,609'. Rig service. Drill and survey, sliding as needed, from 19,609'-20,083'.	Middle Bakken Member
13.25	5/1	20,395'	312'	5	17	40	23	220	3900	-	78	275	Drill and survey, sliding as needed, from 20,083'-20,395'. Reach TD of 20,395' MD at 10:00 hours CDT on April 30, 2015. Pump pill. Short trip/wiper trip. Circulate bottoms up twice. Circulate and condition. TOOH to start completion operations. TIH with liner.	Middle Bakken Member

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)
03/19	2,023'	10.4	92	21	11	11/17/-	53/32	78.2/21.8	66.5/18.5	-	12.5	66.5/18.5	2.4	-	310	52k	9.1/3.4	264320	600	-
03/20	2,086'	9.95	77	14	7	5/10/-	35/21	80.5/19.5	70/17	3	10.7	70/17	1.6	-	2.1	40k	7.5/3.3	264320	575	-
03/21	5,560'	9.7	58	16	6	7/11/-	38/22	80.1/19.9	70.517.5	2	10	80.1/19.9	1.8	-	2.3	33k	6.6/3.4	237087	560	-/34
03/22	8,380'	9.9	54	18	10	10/15/-	46/28	79.3/20.7	69/18	2	11.1	69/18	2.4	-	3.1	32k	7.5/3.6	226592	580	-/60
03/23	9,865'	10.1	67	19	10	12/18/-	48/19	81.2/18.8	69/16	2	12.9	69/16	2.4	-	3.1	45k	7.2/5.7	264320	680	-/90
03/24	10,029'	10.2	83	19	12	11/16/-	50/31	80.2/19.8	69/17	2	11.7	69/17	2.4	-	3.1	50k	8.4/3.3	264320	820	-/32
03/25	10,837'	10.3	60	23	11	12/21/-	57/34	80.0/20.0	68/17	2	12.7	68/17	2.4	-	3.1	48k	8.2/4.5	264320	780	-/30
03/26	11,058'	Change mud from diesel invert to salt water																		
04/25	11,477'	9.5	29	1	3	-	5/4	2.6/97.4	2/90	-	0.4	-	-	10	-	127k	-	-	-	-
04/26	7,880'	9.75	54	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
04/27	15,548'	9.8	29	1	3	-	5/4	0/100	0/93	-	0	-	-	9	-	178k	-	-	-	-
04/28	16,007'	9.8	29	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
04/29	18,315'	9.75	29	1	3	-	5/4	-	1/88.7	-	10.3	-	-	8	-	182k	-	-	-	-
04/30	20,395'	9.75	29	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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	-	2,023'	2,048'	25'	1	1	Vertical	-	-	-	-	Drill cement
2	8 3/4	PDC	Reed	DS616M	2,048'	10,029'	7,981'	62	63	Vertical	Hunting	7/8 5.7	1.50°	0.24	Vertical TD
3	8 3/4	PDC	Security	MMD55M	10,029'	11,058'	1,029'	26	89	Curve	NOV	7/8 5.0	2.38°	0.29	TD Curve
4	6	PDC	Reed	SK516M-A1-Z	11,058'	15,933'	4,875'	60	149	Curve	Ryan	6/7 8.0	1.50°	0.8	Motor failure
5	6	PDC	Reed	SK516M-A1-Z	15,933'	20,395'	4,462'	51	200	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 8B
Surface Location
2,523' FSL & 238' FWL
Lot 3 Sec. 18, T153N, R100W

Bottom Hole Location
165.41' S & 9,951.14' E
of surface location or approx.
2,357.59' FSL & 300.10' FEL
NE SE Sec. 17, T153N, R100W

Oasis Petroleum
Kline Federal 5300 31-
2,523' FSL & 238' FWL
Lot 3 Sec. 18, T153N, R100W
McKenzie County, ND

Gross apparent dip = -0.12°

Oasis Petroleum North America LLC
Kline Federal 5300 31-18 8B
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 8B

Dip Change Points	MD	TVD	TVD diff.	MD diff.	Dip	Dipping up/down	Type of Marker
Marker							
UBS Shale	10,883'	10,699.00					Gamma
Target Entry	10,940'	10,699.00	0.00	57.00	***0.00***	Flat	Gamma
Low gamma between B & C	11,675'	10,702.90	3.90	735.00	***-0.30***	Down	Gamma
Low gamma between B & C	12,832'	10,708.40	5.50	1157.00	***-0.27***	Down	Gamma
Low gamma between B & C	13,844'	10,717.40	9.00	1012.00	***-0.51***	Down	Gamma
Low gamma between B & C	15,158'	10,726.60	9.20	1314.00	***-0.40***	Down	Gamma
Low gamma between B & C	15,911'	10,729.50	2.90	753.00	***-0.22***	Down	Gamma
Cool gamma below D	18,097'	10,725.50	-4.00	2186.00	***0.10***	Up	Gamma
Cool gamma below D	19,630'	10,720.20	-5.30	1533.00	***0.20***	Up	Gamma
Cool gamma below D	20,395'	10,718.70	-1.50	765.00	***0.11***	Up	Gamma
Gross Dip							
Initial Target Contact	10,940'	10,699.00					
Projected Final Target Contact	20,395'	10,718.70	19.70	9455.00	***-0.12***	Down	Projection

Oasis Petroleum North America LLC
Kline Federal 5300 31-18 8B
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:	3/23/2015
Well:	Kline Federal 5300 31-18 8B	Finish:	3/30/2015
Surface Coordinates:	2,523' 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	2059.00	0.90	147.30	2058.93	0.54	8.77	8.77	0.47
1	2154.00	1.10	148.00	2153.92	-0.86	9.66	9.66	0.21
2	2247.00	0.90	152.70	2246.90	-2.27	10.46	10.46	0.23
3	2340.00	1.10	117.90	2339.89	-3.33	11.59	11.59	0.68
4	2434.00	1.30	97.20	2433.87	-3.89	13.44	13.44	0.50
5	2527.00	1.40	78.10	2526.84	-3.79	15.60	15.60	0.49
6	2621.00	0.90	66.00	2620.82	-3.25	17.40	17.40	0.59
7	2714.00	0.60	16.90	2713.82	-2.49	18.21	18.21	0.73
8	2807.00	0.20	352.70	2806.81	-1.86	18.33	18.33	0.46
9	2901.00	1.50	90.30	2900.80	-1.70	19.54	19.54	1.64
10	2994.00	1.80	102.30	2993.76	-2.02	22.18	22.18	0.49
11	3087.00	2.10	102.40	3086.71	-2.70	25.27	25.27	0.32
12	3181.00	1.50	83.10	3180.66	-2.92	28.18	28.18	0.90
13	3274.00	1.20	82.30	3273.64	-2.64	30.35	30.35	0.32
14	3368.00	0.90	79.10	3367.62	-2.37	32.05	32.05	0.33
15	3461.00	0.90	71.80	3460.61	-2.01	33.46	33.46	0.12
16	3554.00	1.00	75.10	3553.60	-1.57	34.94	34.94	0.12
17	3648.00	0.70	55.30	3647.59	-1.03	36.21	36.21	0.44
18	3741.00	0.60	47.30	3740.58	-0.38	37.03	37.03	0.14
19	3835.00	0.50	9.30	3834.58	0.36	37.46	37.46	0.39
20	3928.00	0.30	317.90	3927.58	0.94	37.36	37.36	0.42
21	4021.00	0.40	300.10	4020.57	1.28	36.92	36.92	0.16
22	4115.00	0.40	315.00	4114.57	1.68	36.40	36.40	0.11
23	4208.00	0.20	304.00	4207.57	2.00	36.04	36.04	0.22
24	4302.00	0.30	332.20	4301.57	2.31	35.79	35.79	0.17
25	4395.00	0.40	328.60	4394.57	2.80	35.50	35.50	0.11
26	4488.00	0.80	98.30	4487.57	2.99	35.98	35.98	1.18
27	4582.00	0.70	87.00	4581.56	2.92	37.20	37.20	0.19
28	4675.00	0.50	70.10	4674.55	3.09	38.15	38.15	0.28
29	4769.00	0.80	57.40	4768.55	3.58	39.09	39.09	0.35
30	4862.00	0.70	23.10	4861.54	4.46	39.86	39.86	0.49
31	4955.00	0.80	23.20	4954.53	5.57	40.34	40.34	0.11
32	5049.00	0.10	51.70	5048.53	6.23	40.66	40.66	0.76
33	5142.00	0.30	291.30	5141.53	6.37	40.50	40.50	0.39
34	5235.00	0.30	207.60	5234.53	6.24	40.16	40.16	0.43
35	5329.00	0.70	185.00	5328.52	5.45	39.99	39.99	0.47
36	5422.00	0.40	215.00	5421.52	4.62	39.76	39.76	0.44
37	5516.00	0.30	250.80	5515.52	4.27	39.34	39.34	0.25

SUNBURST CONSULTING, INC.

Operator:	Oasis Petroleum North America LLC	Kick-off:	3/23/2015
Well:	Kline Federal 5300 31-18 8B	Finish:	3/30/2015
Surface Coordinates:	2,523' 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	5609.00	0.30	225.70	5608.52	4.02	38.93	38.93	0.14
39	5702.00	0.40	332.80	5701.51	4.14	38.61	38.61	0.61
40	5796.00	0.40	34.30	5795.51	4.70	38.64	38.64	0.44
41	5889.00	0.40	26.70	5888.51	5.26	38.97	38.97	0.06
42	5982.00	0.10	305.20	5981.51	5.59	39.05	39.05	0.43
43	6076.00	0.40	212.80	6075.51	5.37	38.81	38.81	0.44
44	6169.00	0.70	211.60	6168.50	4.61	38.33	38.33	0.32
45	6262.00	0.70	226.70	6261.50	3.74	37.62	37.62	0.20
46	6356.00	1.00	188.70	6355.49	2.53	37.08	37.08	0.66
47	6449.00	1.80	177.60	6448.46	0.27	37.02	37.02	0.90
48	6542.00	1.70	134.20	6541.42	-2.15	38.07	38.07	1.39
49	6636.00	0.90	115.40	6635.40	-3.44	39.74	39.74	0.95
50	6729.00	1.30	143.10	6728.38	-4.60	41.03	41.03	0.70
51	6822.00	0.40	146.90	6821.37	-5.71	41.84	41.84	0.97
52	6916.00	0.60	164.10	6915.36	-6.46	42.15	42.15	0.26
53	7009.00	0.70	168.60	7008.36	-7.49	42.40	42.40	0.12
54	7102.00	0.60	157.50	7101.35	-8.49	42.70	42.70	0.17
55	7196.00	0.40	186.90	7195.35	-9.27	42.85	42.85	0.34
56	7289.00	0.80	63.70	7288.35	-9.31	43.39	43.39	1.15
57	7382.00	1.00	51.50	7381.33	-8.51	44.61	44.61	0.30
58	7475.00	1.10	40.00	7474.32	-7.33	45.82	45.82	0.25
59	7568.00	1.00	46.50	7567.30	-6.08	46.98	46.98	0.17
60	7662.00	0.80	59.70	7661.29	-5.19	48.14	48.14	0.31
61	7755.00	0.90	59.70	7754.28	-4.49	49.33	49.33	0.11
62	7848.00	0.80	51.50	7847.27	-3.72	50.47	50.47	0.17
63	7942.00	0.80	25.30	7941.26	-2.72	51.26	51.26	0.39
64	8035.00	0.70	8.80	8034.25	-1.57	51.63	51.63	0.25
65	8128.00	0.70	0.30	8127.25	-0.44	51.72	51.72	0.11
66	8222.00	0.90	341.40	8221.24	0.83	51.49	51.49	0.35
67	8315.00	0.80	340.40	8314.23	2.14	51.03	51.03	0.11
68	8409.00	0.80	355.70	8408.22	3.41	50.77	50.77	0.23
69	8502.00	0.50	346.20	8501.21	4.45	50.62	50.62	0.34
70	8595.00	0.40	326.40	8594.21	5.12	50.34	50.34	0.20
71	8689.00	0.40	334.90	8688.21	5.69	50.02	50.02	0.06
72	8782.00	0.50	342.90	8781.20	6.37	49.77	49.77	0.13
73	8875.00	0.60	327.60	8874.20	7.17	49.39	49.39	0.19
74	8969.00	0.60	314.90	8968.20	7.93	48.77	48.77	0.14
75	9062.00	0.50	333.60	9061.19	8.64	48.25	48.25	0.22

SUNBURST CONSULTING, INC.

Operator:	Oasis Petroleum North America LLC	Kick-off:	3/23/2015
Well:	Kline Federal 5300 31-18 8B	Finish:	3/30/2015
Surface Coordinates:	2,523' 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	9155.00	0.60	327.60	9154.19	9.41	47.81	47.81	0.12
77	9248.00	0.50	312.10	9247.18	10.10	47.24	47.24	0.19
78	9342.00	0.60	323.60	9341.18	10.77	46.65	46.65	0.16
79	9435.00	0.50	316.30	9434.17	11.45	46.08	46.08	0.13
80	9528.00	0.50	322.00	9527.17	12.07	45.55	45.55	0.05
81	9622.00	0.70	241.00	9621.17	12.11	44.79	44.79	0.84
82	9715.00	0.70	252.20	9714.16	11.66	43.76	43.76	0.15
83	9808.00	0.50	253.90	9807.15	11.38	42.83	42.83	0.22
84	9901.00	0.40	241.70	9900.15	11.11	42.15	42.15	0.15
85	9972.00	0.40	265.50	9971.15	10.97	41.68	41.68	0.23
86	10030.00	0.50	261.20	10029.15	10.92	41.23	41.23	0.18
87	10124.00	0.40	290.10	10123.15	10.97	40.52	40.52	0.26
88	10155.00	1.20	100.20	10154.14	10.95	40.74	40.74	5.15
89	10186.00	5.40	112.10	10185.09	10.34	42.41	42.41	13.65
90	10217.00	8.60	112.60	10215.85	8.90	45.90	45.90	10.32
91	10248.00	12.60	106.90	10246.32	7.03	51.28	51.28	13.32
92	10279.00	15.70	104.80	10276.37	4.97	58.57	58.57	10.13
93	10310.00	18.20	103.30	10306.02	2.79	67.34	67.34	8.19
94	10342.00	20.90	103.90	10336.18	0.26	77.74	77.74	8.46
95	10373.00	24.20	106.60	10364.80	-2.88	89.20	89.20	11.15
96	10404.00	26.90	104.80	10392.77	-6.49	102.08	102.08	9.06
97	10435.00	30.30	102.90	10419.98	-10.03	116.48	116.48	11.35
98	10466.00	34.20	103.20	10446.20	-13.76	132.59	132.59	12.59
99	10497.00	37.20	102.90	10471.37	-17.84	150.22	150.22	9.69
100	10528.00	40.70	102.90	10495.47	-22.19	169.21	169.21	11.29
101	10560.00	45.00	102.60	10518.93	-26.99	190.43	190.43	13.45
102	10591.00	45.10	101.80	10540.83	-31.63	211.87	211.87	1.85
103	10622.00	47.90	102.10	10562.16	-36.29	233.87	233.87	9.06
104	10653.00	50.30	104.20	10582.46	-41.62	256.68	256.68	9.28
105	10684.00	54.10	103.80	10601.46	-47.55	280.44	280.44	12.30
106	10715.00	59.20	103.60	10618.50	-53.68	305.60	305.60	16.46
107	10746.00	63.10	103.70	10633.45	-60.08	331.98	331.98	12.58
108	10778.00	65.20	102.80	10647.40	-66.68	360.01	360.01	7.03
109	10809.00	65.30	102.50	10660.38	-72.85	387.47	387.47	0.94
110	10840.00	66.80	102.70	10672.96	-79.03	415.12	415.12	4.87
111	10871.00	71.40	102.80	10684.02	-85.42	443.36	443.36	14.84
112	10902.00	77.20	102.70	10692.41	-92.00	472.46	472.46	18.71
113	10933.00	82.90	102.70	10697.76	-98.71	502.23	502.23	18.39

SUNBURST CONSULTING, INC.

Operator:	Oasis Petroleum North America LLC	Kick-off:	3/23/2015
Well:	Kline Federal 5300 31-18 8B	Finish:	3/30/2015
Surface Coordinates:	2,523' 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	10964.00	87.30	103.00	10700.41	-105.58	532.34	532.34	14.23
115	10995.00	88.30	102.50	10701.60	-112.42	562.55	562.55	3.61
116	11052.00	89.90	100.80	10702.49	-123.92	618.36	618.36	4.10
117	11069.00	90.60	102.90	10702.42	-127.41	635.00	635.00	13.02
118	11101.00	90.30	102.80	10702.17	-134.53	666.20	666.20	0.99
119	11131.00	89.90	102.40	10702.11	-141.07	695.48	695.48	1.89
120	11161.00	89.80	102.40	10702.19	-147.52	724.78	724.78	0.33
121	11192.00	89.60	101.80	10702.36	-154.01	755.09	755.09	2.04
122	11223.00	87.50	101.20	10703.14	-160.19	785.45	785.45	7.05
123	11255.00	87.51	101.20	10704.53	-166.40	816.81	816.81	0.03
124	11285.00	87.50	101.30	10705.84	-172.25	846.21	846.21	0.33
125	11315.00	88.40	99.00	10706.91	-177.53	875.72	875.72	8.23
126	11346.00	88.80	98.20	10707.67	-182.17	906.36	906.36	2.88
127	11376.00	88.60	98.10	10708.35	-186.42	936.05	936.05	0.75
128	11407.00	88.20	95.60	10709.22	-190.11	966.81	966.81	8.16
129	11437.00	88.40	94.90	10710.11	-192.86	996.67	996.67	2.43
130	11469.00	88.70	94.40	10710.92	-195.45	1028.56	1028.56	1.82
131	11500.00	90.20	93.60	10711.21	-197.61	1059.48	1059.48	5.48
132	11530.00	90.40	93.60	10711.06	-199.50	1089.42	1089.42	0.67
133	11560.00	90.50	93.40	10710.82	-201.33	1119.36	1119.36	0.75
134	11591.00	90.90	91.20	10710.44	-202.57	1150.34	1150.34	7.21
135	11621.00	91.10	90.30	10709.92	-202.96	1180.33	1180.33	3.07
136	11652.00	90.90	89.50	10709.38	-202.91	1211.32	1211.32	2.66
137	11684.00	89.90	87.90	10709.15	-202.18	1243.31	1243.31	5.90
138	11779.00	89.50	87.80	10709.65	-198.62	1338.24	1338.24	0.43
139	11872.00	89.40	87.30	10710.54	-194.65	1431.15	1431.15	0.55
140	11964.00	90.00	87.30	10711.03	-190.31	1523.05	1523.05	0.65
141	12056.00	90.40	86.80	10710.70	-185.58	1614.93	1614.93	0.70
142	12151.00	88.50	87.40	10711.62	-180.77	1709.80	1709.80	2.10
143	12245.00	88.50	88.70	10714.08	-177.57	1803.71	1803.71	1.38
144	12340.00	89.50	89.80	10715.73	-176.33	1898.68	1898.68	1.56
145	12435.00	89.60	90.60	10716.48	-176.66	1993.68	1993.68	0.85
146	12530.00	90.70	91.20	10716.23	-178.15	2088.66	2088.66	1.32
147	12625.00	90.80	90.70	10714.99	-179.73	2183.64	2183.64	0.54
148	12720.00	90.30	90.20	10714.08	-180.48	2278.63	2278.63	0.74
149	12814.00	90.50	89.90	10713.42	-180.56	2372.63	2372.63	0.38
150	12909.00	90.90	90.00	10712.26	-180.47	2467.63	2467.63	0.43
151	13004.00	89.40	89.30	10712.01	-179.89	2562.62	2562.62	1.74

SUNBURST CONSULTING, INC.

Operator:	Oasis Petroleum North America LLC	Kick-off:	3/23/2015
Well:	Kline Federal 5300 31-18 8B	Finish:	3/30/2015
Surface Coordinates:	2,523' 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	13099.00	89.30	89.20	10713.09	-178.65	2657.61	2657.61	0.15
153	13194.00	89.80	88.80	10713.84	-176.99	2752.59	2752.59	0.67
154	13289.00	89.00	89.80	10714.83	-175.83	2847.57	2847.57	1.35
155	13383.00	89.50	90.10	10716.06	-175.75	2941.56	2941.56	0.62
156	13478.00	90.10	89.70	10716.39	-175.58	3036.56	3036.56	0.76
157	13573.00	89.80	91.30	10716.47	-176.41	3131.56	3131.56	1.71
158	13668.00	88.40	90.40	10717.97	-177.82	3226.53	3226.53	1.75
159	13763.00	88.50	90.00	10720.54	-178.15	3321.50	3321.50	0.43
160	13857.00	89.20	90.40	10722.42	-178.48	3415.48	3415.48	0.86
161	13952.00	89.90	90.20	10723.17	-178.98	3510.47	3510.47	0.77
162	14047.00	89.50	90.60	10723.67	-179.64	3605.47	3605.47	0.60
163	14142.00	90.10	90.60	10724.00	-180.64	3700.46	3700.46	0.63
164	14237.00	89.00	91.30	10724.74	-182.21	3795.44	3795.44	1.37
165	14332.00	90.00	91.10	10725.57	-184.20	3890.42	3890.42	1.07
166	14427.00	90.10	90.60	10725.49	-185.61	3985.41	3985.41	0.54
167	14521.00	89.10	90.40	10726.15	-186.43	4079.40	4079.40	1.08
168	14616.00	90.40	90.60	10726.56	-187.26	4174.39	4174.39	1.38
169	14711.00	91.40	90.20	10725.07	-187.92	4269.38	4269.38	1.13
170	14806.00	89.30	89.90	10724.49	-188.01	4364.37	4364.37	2.23
171	14901.00	89.50	89.80	10725.48	-187.76	4459.36	4459.36	0.24
172	14996.00	88.20	89.60	10727.39	-187.26	4554.34	4554.34	1.38
173	15090.00	88.50	89.70	10730.10	-186.69	4648.30	4648.30	0.34
174	15185.00	88.40	89.40	10732.67	-185.94	4743.26	4743.26	0.33
175	15280.00	89.90	89.80	10734.08	-185.28	4838.25	4838.25	1.63
176	15375.00	90.50	88.70	10733.74	-184.03	4933.24	4933.24	1.32
177	15470.00	90.20	88.00	10733.16	-181.30	5028.19	5028.19	0.80
178	15564.00	90.10	89.50	10732.92	-179.25	5122.17	5122.17	1.60
179	15659.00	90.60	91.60	10732.34	-180.16	5217.16	5217.16	2.27
180	15754.00	88.60	91.30	10733.00	-182.56	5312.12	5312.12	2.13
181	15849.00	90.10	92.20	10734.08	-185.47	5407.07	5407.07	1.84
182	15943.00	91.30	92.30	10732.93	-189.16	5500.98	5500.98	1.28
183	16038.00	90.60	90.00	10731.35	-191.06	5595.95	5595.95	2.53
184	16133.00	89.30	90.40	10731.44	-191.39	5690.94	5690.94	1.43
185	16228.00	89.40	90.40	10732.52	-192.06	5785.93	5785.93	0.11
186	16323.00	90.20	89.70	10732.85	-192.14	5880.93	5880.93	1.12
187	16417.00	88.00	89.20	10734.32	-191.24	5974.91	5974.91	2.40
188	16512.00	87.90	88.60	10737.72	-189.41	6069.83	6069.83	0.64
189	16607.00	87.80	88.60	10741.29	-187.09	6164.74	6164.74	0.11

SUNBURST CONSULTING, INC.

Operator:	Oasis Petroleum North America LLC	Kick-off:	3/23/2015
Well:	Kline Federal 5300 31-18 8B	Finish:	3/30/2015
Surface Coordinates:	2,523' 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	16702.00	89.50	89.20	10743.52	-185.27	6259.69	6259.69	1.90
191	16796.00	90.20	88.60	10743.77	-183.47	6353.67	6353.67	0.98
192	16891.00	90.70	89.20	10743.02	-181.64	6448.65	6448.65	0.82
193	16986.00	89.80	89.20	10742.61	-180.32	6543.64	6543.64	0.95
194	17081.00	90.40	90.20	10742.44	-179.82	6638.63	6638.63	1.23
195	17176.00	90.70	89.80	10741.53	-179.82	6733.63	6733.63	0.53
196	17271.00	91.20	90.50	10739.96	-180.07	6828.62	6828.62	0.91
197	17365.00	89.90	91.30	10739.05	-181.54	6922.60	6922.60	1.62
198	17460.00	90.50	90.90	10738.72	-183.37	7017.58	7017.58	0.76
199	17555.00	89.50	93.10	10738.72	-186.68	7112.51	7112.51	2.54
200	17650.00	89.70	93.40	10739.39	-192.07	7207.36	7207.36	0.38
201	17745.00	90.50	92.80	10739.22	-197.21	7302.22	7302.22	1.05
202	17839.00	89.60	91.00	10739.14	-200.32	7396.16	7396.16	2.14
203	17934.00	89.90	89.90	10739.55	-201.07	7491.16	7491.16	1.20
204	18029.00	90.50	89.60	10739.22	-200.65	7586.15	7586.15	0.71
205	18124.00	91.00	90.20	10737.98	-200.49	7681.14	7681.14	0.82
206	18219.00	91.30	89.40	10736.07	-200.16	7776.12	7776.12	0.90
207	18313.00	90.00	89.60	10735.00	-199.34	7870.11	7870.11	1.40
208	18408.00	89.90	90.40	10735.09	-199.34	7965.11	7965.11	0.85
209	18502.00	90.80	89.50	10734.51	-199.26	8059.11	8059.11	1.35
210	18597.00	90.10	88.20	10733.77	-197.35	8154.08	8154.08	1.55
211	18692.00	90.20	86.40	10733.52	-192.87	8248.97	8248.97	1.90
212	18787.00	89.60	86.60	10733.68	-187.07	8343.80	8343.80	0.67
213	18882.00	89.60	86.70	10734.35	-181.52	8438.63	8438.63	0.11
214	18976.00	89.80	86.30	10734.84	-175.78	8532.45	8532.45	0.48
215	19071.00	90.40	89.20	10734.67	-172.06	8627.37	8627.37	3.12
216	19166.00	90.50	88.80	10733.93	-170.40	8722.35	8722.35	0.43
217	19261.00	89.90	89.70	10733.60	-169.15	8817.34	8817.34	1.14
218	19356.00	89.70	90.30	10733.93	-169.15	8912.34	8912.34	0.67
219	19450.00	90.00	89.90	10734.17	-169.32	9006.34	9006.34	0.53
220	19545.00	90.00	89.20	10734.17	-168.57	9101.34	9101.34	0.74
221	19640.00	90.60	91.30	10733.68	-168.99	9196.33	9196.33	2.30
222	19735.00	91.40	90.80	10732.02	-170.73	9291.30	9291.30	0.99
223	19829.00	90.00	90.60	10730.87	-171.88	9385.28	9385.28	1.50
224	19924.00	90.30	91.00	10730.62	-173.20	9480.27	9480.27	0.53
225	20019.00	90.60	89.90	10729.87	-173.95	9575.26	9575.26	1.20
226	20114.00	89.30	88.50	10729.96	-172.62	9670.25	9670.25	2.01
227	20209.00	89.30	88.10	10731.12	-169.80	9765.20	9765.20	0.42

SUNBURST CONSULTING, INC.

Operator:	Oasis Petroleum North America LLC	Kick-off:	3/23/2015
Well:	Kline Federal 5300 31-18 8B	Finish:	3/30/2015
Surface Coordinates:	2,523' 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	20304.00	89.40	89.00	10732.20	-167.40	9860.16	9860.16	0.95
229	20331.00	89.70	88.70	10732.41	-166.86	9887.16	9887.16	1.57
230	20395.00	89.70	88.70	10732.74	-165.41	9951.14	9951.14	0.00

DEVIATION SURVEYS

Depth	Inclination	Azimuth
132	0.2	99.1
223	0.2	77.2
314	0.4	58.2
407	0.7	27
493	0.8	43.1
579	0.7	39.7
669	0.4	68.6
751	0.4	66.8
839	0.7	76.4
927	0.7	98.6
1013	0.2	141
1100	0.2	151
1189	0.9	200
1277	0.7	226.4
1365	0.3	108.7
1450	0.4	67.4
1536	0.4	91.6
1623	0.5	52.3
1711	0.2	37.8
1799	0.1	40.5
1886	0.1	164.6
1974	0.5	151.4
2059	0.9	147.3

FORMATION TOPS & STRUCTURAL RELATIONSHIPS

Operator:	Subject Well:									Offset Well:		
Well Name:	Oasis Petroleum North America, LLC											
	Kline Federal 5300 31-18 8B											
Location:	2,523' 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'	8,321'	8,320'	-	-6,287'	149'	2,388'	0'	-19'	5'	0'
Charles Salt	8,462'	-6,429'	8,470'	8,469'	-	-6,436'	614'	2,239'	-7'	-23'	4'	-3'
UB	9,110'	-7,077'	9,084'	9,083'	-	-7,050'	64'	1,625'	27'	-25'	12'	2'
Base of Last Salt	9,152'	-7,119'	9,148'	9,147'	-	-7,114'	34'	1,561'	5'	-5'	23'	5'
Ratcliffe	9,180'	-7,147'	9,182'	9,181'	-	-7,148'	211'	1,527'	-1'	-6'	37'	-1'
Mission Canyon	9,390'	-7,357'	9,393'	9,392'	-	-7,359'	555'	1,316'	-2'	-23'	2'	-2'
Lodgepole	9,946'	-7,913'	9,948'	9,947'	-	-7,914'	102'	761'	-1'	-28'	3'	-1'
LP A	-	-	10,050'	10,049'	-	-8,016'	108'	659'	-	-	4'	-5'
LP Fracture Zone	10,147'	-8,114'	10,158'	10,157'	-	-8,124'	18'	551'	-	-	17'	-10'
LP C	-	-	10,176'	10,175'	-	-8,142'	186'	533'	-28'	-	36'	-7'
LP D	-	-	10,372'	10,361'	-	-8,328'	138'	347'	-	-13'	3'	-4'
LP E	-	-	10,533'	10,499'	-	-8,466'	116'	209'	-	-19'	-5'	-1'
LP F	-	-	10,711'	10,615'	-	-8,582'	44'	93'	-	-20'	-9'	-1'
False Bakken	10,660'	-8,627'	10,807'	10,659'	-	-8,626'	4'	49'	1'	-15'	-8'	1'
Scallion	-	-	10,818'	10,663'	-	-8,630'	8'	45'	-	-17'	-8'	-1'
Upper Bakken Shale	10,671'	-8,638'	10,835'	10,671'	-	-8,638'	16'	37'	0'	-21'	-10'	0'
Middle Bakken	10,687'	-8,654'	10,883'	10,687'	-	-8,654'	11'	21'	0'	-23'	-11'	0'
Target Top	10,693'	-8,660'	10,934'	10,698'	-	-8,665'	10'	10'	-5'	-23'	-11'	0'
Target Landing	-	-	11,058'	10,708'	-	-8,675'	-	0'	-	-23'	-11'	0'
Target Bottom	10,703'	-8,670'	-	-	-	-	-	-	-	-	-	-
Lower Bakken Shale	10,729'	-8,696'	-	-	-	-	-	-	-	-	-	-

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'	2,384'	8,371'	-6,292'	148'	2,372'	8,320'	-6,287'	146'	2,388'
Charles Salt	8,491'	-6,413'	612'	2,239'	8,519'	-6,440'	622'	2,224'	8,466'	-6,433'	619'	2,242'
UB	9,103'	-7,025'	84'	1,627'	9,141'	-7,062'	75'	1,602'	9,085'	-7,052'	67'	1,623'
Base of Last Salt	9,187'	-7,109'	33'	1,543'	9,216'	-7,137'	48'	1,527'	9,152'	-7,119'	28'	1,556'
Ratcliffe	9,220'	-7,142'	194'	1,510'	9,264'	-7,185'	176'	1,479'	9,180'	-7,147'	210'	1,528'
Mission Canyon	9,414'	-7,336'	550'	1,316'	9,440'	-7,361'	556'	1,303'	9,390'	-7,357'	556'	1,318'
Lodgepole	9,964'	-7,886'	-	766'	9,996'	-7,917'	103'	747'	9,946'	-7,913'	98'	762'
LP A	-	-	-	-	10,099'	-8,020'	121'	644'	10,044'	-8,011'	103'	664'
LP Fracture Zone	-	-	-	-	10,220'	-8,141'	37'	523'	10,147'	-8,114'	21'	561'
LP C	-	-	-	-	10,257'	-8,178'	153'	486'	10,168'	-8,135'	189'	540'
LP D	10,393'	-8,315'	132'	337'	10,410'	-8,331'	130'	333'	10,357'	-8,324'	141'	351'
LP E	10,525'	-8,447'	115'	205'	10,540'	-8,461'	112'	203'	10,498'	-8,465'	116'	210'
LP F	10,640'	-8,562'	49'	90'	10,652'	-8,573'	45'	91'	10,614'	-8,581'	46'	94'
False Bakken	10,689'	-8,611'	2'	41'	10,697'	-8,618'	4'	46'	10,660'	-8,627'	2'	48'
Scallion	10,691'	-8,613'	4'	39'	10,701'	-8,622'	6'	42'	10,662'	-8,629'	9'	46'
Upper Bakken Shale	10,695'	-8,617'	14'	35'	10,707'	-8,628'	15'	36'	10,671'	-8,638'	16'	37'
Middle Bakken	10,709'	-8,631'	11'	21'	10,722'	-8,643'	11'	21'	10,687'	-8,654'	11'	21'
Target Top	10,720'	-8,642'	10'	10'	10,733'	-8,654'	10'	10'	10,698'	-8,665'	10'	10'
Target Landing	10,730'	-8,652'	6'	0'	10,743'	-8,664'	6'	0'	10,708'	-8,675'	6'	0'
Target Base	10,736'	-8,658'	18'	-	10,749'	-8,670'	-	-	10,714'	-8,681'	15'	-
Lower Baken Shale	10,754'	-8,676'	-	-			-	-	10,729'	-8,696'	-	-

INTERVAL THICKNESS

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	10,704'	10,692'	10,708'	10,701'
Charles Salt	10,708'	10,693'	10,711'	10,704'
UB	10,710'	10,685'	10,706'	10,700'
Base of Last Salt	10,690'	10,674'	10,703'	10,689'
Ratcliffe	10,691'	10,660'	10,709'	10,687'
Mission Canyon	10,708'	10,695'	10,710'	10,704'
Lodgepole	10,713'	10,694'	10,709'	10,705'
LP A	-	10,693'	10,713'	10,703'
LP Fracture Zone	-	10,680'	10,718'	10,699'
LP C	-	10,661'	10,715'	10,688'
LP D	10,698'	10,694'	10,712'	10,701'
LP E	10,704'	10,702'	10,709'	10,705'
LP F	10,705'	10,706'	10,709'	10,707'
False Bakken	10,700'	10,705'	10,707'	10,704'
Scallion	10,702'	10,705'	10,709'	10,705'
Upper Bakken Shale	10,706'	10,707'	10,708'	10,707'
Middle Bakken	10,708'	10,708'	10,708'	10,708'
Target Top	10,708'	10,708'	10,708'	10,708'
Target Landing	10,708'	10,708'	10,708'	10,708'

Current Landing Target (21' below the base of the UBS): **10,708'**

ISOPACH TO TARGET

Oasis Petroleum North America, LLC - Kline Federal 5300 31-18 8B

LITHOLOGY

Oasis Petroleum North America, LLC
Kline Federal 5300 31-18 8B

Rig crews caught 30' sample intervals, under the supervision of Sunburst geologists, from 8,240', to the TD of the lateral at 20,395'. 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)

Drilling in the Kibbey Formation [Mississippian Big Snowy Group]

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 8,321' MD / 8,320' TVD (-6,287')

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

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

Charles Formation [Mississippian Madison Group] 8,470' MD / 8,469' TVD (-6,436')

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 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

8,660-8,690 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-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

8,990-9,020 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

Base Last Salt [Charles Formation] 9,084' MD / 9,083' TVD (-7,050')

9,080-9,110 SALT: translucent-transparent, clear, micro crystalline, hard, euhedral, crystalline; rare 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

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

Base Last Salt [Charles Formation] 9,148' MD / 9,147' TVD (-7,114')

9,140-9,170 DOLOMITIC LIMESTONE-DOLOMITE: mudstone, light brown, tan, microcrystalline, firm-friable, dense, crystalline-earthy texture, possible intercrystalline porosity, trace light brown spotty; occasional ANHYDRITE: cream-tan, off white, microcrystalline, soft, massive, earthy

Ratclife [Charles Formation] 9,182' MD / 9,181' TVD (-7,148')

9,170-9,200 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

9,200-9,230 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 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

9,320-9,350 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] 9,948' MD / 9,947' TVD (-7,914')

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 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 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

10,010-10,029 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

10,029-10,040 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

10,160-10,190 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, occasional gray brown, trace cream-off white, firm, crystalline-earthy texture, trace disseminated pyrite, no visible porosity, no visible oil stain

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

10,250-10,280 ARGILLACEOUS LIMESTONE: mudstones, 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, trace cream-off white, 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, light gray-gray, light gray brown, trace dark gray, firm, crystalline-earthy texture, trace disseminated pyrite, no visible porosity, no visible oil stain

10,430-10,460 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

10,460-10,490 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, 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 dark 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 dark gray, firm, crystalline-earthy texture, trace disseminated pyrite, no visible porosity, no visible oil stain

10,700-10,730 ARGILLACEOUS LIMESTONE: mudstone, light gray, medium gray, rare light brown gray, trace dark gray, firm, crystalline-earthy texture, trace disseminated pyrite, no visible porosity, no visible oil stain

10,730-10,760 ARGILLACEOUS LIMESTONE: mudstone, light gray, medium gray, rare light brown gray, trace dark gray, firm, crystalline-earthy texture, trace disseminated pyrite, no visible porosity, no visible oil stain

10,760-10,790 ARGILLACEOUS LIMESTONE: mudstone, light gray, medium gray, rare light brown gray, trace dark gray, firm, crystalline-earthy texture, trace disseminated pyrite, no visible porosity, no visible oil stain

False Bakken [Lodgepole Formation] 10,807' MD / 10,659' TVD (-8,626')

10,790-10,820 ARGILLACEOUS LIMESTONE: mudstone, light gray, medium gray, rare light brown gray, trace dark gray, firm, crystalline-earthy texture, trace disseminated pyrite, no visible porosity, no visible oil stain

Scallion [Lodgepole Formation] 10,818' MD / 10,663' TVD (-8,630')

10,790-10,820 ARGILLACEOUS LIMESTONE: mudstone, light gray, medium gray, rare light brown gray, trace dark gray, firm, crystalline-earthy texture, trace disseminated pyrite, no visible porosity, no visible oil stain

Upper Bakken Shale [Bakken Formation] 10,835' MD / 10,671' TVD (-8,638')

10,820-10,850 SHALE: black, black gray, hard, splintery, smooth, pyritic, carbonaceous, fracture porosity; LIMESTONE: mudstone, light gray, medium gray, rare light brown gray, firm, crystalline-earthy texture, trace disseminated pyrite, possible intercrystalline porosity, no visible oil stain

10,850-10,880 SHALE: black, black gray, hard, splintery, smooth, pyritic, carbonaceous, fracture porosity

Middle Bakken Member [Bakken Formation] 10,883' MD / 10,687' TVD (-8,654')

10,880-10,910 SILTSTONE: 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

10,910-10,940 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

10,940-10,970 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

10,970-11,000 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

11,000-11,030 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

11,030-11,058 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

11,058-11,090 SILTY SANDSTONE: light brown-light gray brown, occasional medium brown, trace light gray, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated and nodular pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain

11,090-11,120 SILTY SANDSTONE: light brown-light gray brown, occasional medium brown, trace light gray, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated and nodular pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain

11,120-11,150 SILTY SANDSTONE: light brown-light gray brown, occasional medium brown, trace light gray, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated and nodular pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain

11,150-11,180 SILTY SANDSTONE: light brown-light gray brown, occasional medium brown, trace light gray, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated and nodular pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain

11,180-11,210 SILTY SANDSTONE: light brown-light gray brown, occasional medium brown, trace light gray, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated and nodular pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain

11,210-11,240 SILTY SANDSTONE: light brown-light gray brown, occasional medium brown, trace light gray, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated and nodular pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain

11,240-11,270 SILTY SANDSTONE: light brown-light gray brown, occasional medium brown, trace light gray, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated and nodular pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain

11,270-11,300 SILTY SANDSTONE: light brown-light gray brown, occasional medium brown, trace light gray, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated and nodular pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain

11,300-11,330 SILTY SANDSTONE: light brown-light gray brown, occasional medium brown, trace light gray, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated and nodular pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain

11,330-11,360 SILTY SANDSTONE: light gray brown-light brown, occasional medium brown, trace light gray, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated and nodular pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain

11,360-11,390 SILTY SANDSTONE: light brown-light gray brown, occasional medium brown, trace light gray, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated and nodular pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain

11,390-11,420 SILTY SANDSTONE: light brown-light gray brown, occasional medium brown, trace light gray, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated and nodular pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain

11,420-11,450 SILTY SANDSTONE: light brown-light gray brown, occasional medium brown, trace light gray, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated and nodular pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain

11,450-11,480 SILTY SANDSTONE: light brown-light gray brown, occasional medium brown, trace light gray, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated and nodular pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain

11,480-11,510 SILTY SANDSTONE: light brown-light gray brown, occasional medium brown, trace light gray, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated and nodular pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain

11,510-11,540 SILTY SANDSTONE: light brown-light gray brown, occasional medium brown, trace light gray, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated and nodular pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain

11,540-11,570 SILTY SANDSTONE: light brown-light gray brown, occasional medium brown, trace light gray, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated and nodular pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain

11,570-11,600 SILTY SANDSTONE: light brown-light gray brown, occasional medium brown, trace light gray, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated and nodular pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain

11,600-11,630 SILTY SANDSTONE: light brown-light gray brown, occasional medium brown, trace light gray, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated and nodular pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain

11,630-11,660 SILTY SANDSTONE: light gray brown, occasional medium brown, trace light gray, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated and nodular pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain

11,660-11,690 SILTY SANDSTONE: light gray brown, occasional medium brown, trace light gray, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated and nodular pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain

11,690-11,720 SILTY SANDSTONE: light gray brown, occasional medium brown, trace light gray, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated and nodular pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain

11,720-11,750 SILTY SANDSTONE: medium-dark gray brown, trace light gray, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated and nodular pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain

11,750-11,780 SILTY SANDSTONE: medium-dark gray brown, rare light gray, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated and nodular pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain

11,780-11,810 SILTY SANDSTONE: medium-dark gray brown, rare light gray, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated and nodular pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain

11,810-11,840 SILTY SANDSTONE: medium-dark gray brown, rare light gray, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated and nodular pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain

11,840-11,870 SILTY SANDSTONE: medium-dark gray brown, common brown, rare light gray, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated and nodular pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain

11,870-11,900 SILTY SANDSTONE: medium-dark gray brown, common brown, rare light gray, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated and nodular pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain

11,900-11,930 SILTY SANDSTONE: medium-dark gray brown, common brown, rare light gray, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated and nodular pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain

11,930-11,960 SILTY SANDSTONE: medium-dark gray brown, common brown, rare light gray, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated and nodular pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain

11,960-11,990 SILTY SANDSTONE: medium-dark gray brown, common brown, rare light gray, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated and nodular pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain

11,990-12,020 SILTY SANDSTONE: medium-dark gray brown, common brown, rare light gray, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated and nodular pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain

12,020-12,050 SILTY SANDSTONE: light-medium gray brown, common brown, rare light gray, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated and nodular pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain

12,050-12,080 SILTY SANDSTONE: light-medium gray brown, common brown, rare light gray, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated and nodular pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain

12,080-12,110 SILTY SANDSTONE: light-medium gray brown, common brown, rare light gray, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated and nodular pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain

12,110-12,140 SILTY SANDSTONE: light-medium gray brown, common brown, rare light gray, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated and nodular pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain

12,140-12,170 SILTY SANDSTONE: light-medium gray brown, common brown, rare light gray, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated and nodular pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain

12,170-12,200 SILTY SANDSTONE: light-medium gray brown, common brown, rare light gray, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated and nodular pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain

12,200-12,230 SILTY SANDSTONE: light-medium gray brown, common brown, rare light gray, trace cream-off white, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated and nodular pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain

12,230-12,260 SILTY SANDSTONE: light-medium gray brown, common brown, rare light gray, trace cream-off white, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated and nodular pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain

12,260-12,290 SILTY SANDSTONE: light gray brown, common light gray, occasional cream-off white, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated and nodular pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain

12,290-12,320 SILTY SANDSTONE: light gray brown, common light gray, occasional cream-off white, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated and nodular pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain

12,320-12,350 SILTY SANDSTONE: light gray brown, common light gray, occasional cream-off white, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated and nodular pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain

12,350-12,380 SILTY SANDSTONE: light gray brown, common light gray, occasional cream-off white, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated and nodular pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain

12,380-12,410 SILTY SANDSTONE: light gray brown, common medium brown, occasional cream-off white, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated and nodular pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain

12,410-12,440 SILTY SANDSTONE: light gray brown, common medium brown, occasional cream-off white, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated and nodular pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain

12,440-12,470 SILTY SANDSTONE: light gray brown, common medium brown, occasional cream-off white, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated and nodular pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain

12,470-12,500 SILTY SANDSTONE: light gray brown, common medium brown, occasional cream-off white, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated and nodular pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain

12,500-12,530 SILTY SANDSTONE: light-medium gray brown, common medium brown, rare cream-off white, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated and nodular pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain

12,530-12,560 SILTY SANDSTONE: light-medium gray brown, common medium brown, rare cream-off white, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated and nodular pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain

12,560-12,590 SILTY SANDSTONE: light gray, common cream-off white, rare light brown, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated and nodular pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain

12,590-12,620 SILTY SANDSTONE: light gray, common cream-off white, rare light brown, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated and nodular pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain

12,620-12,650 SILTY SANDSTONE: light gray, common cream-off white, rare light brown, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated and nodular pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain

12,650-12,680 SILTY SANDSTONE: light gray, common cream-off white, rare light brown, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated and nodular pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain

12,680-12,710 SILTY SANDSTONE: medium-dark gray brown, occasional light gray, trace cream-tan, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated and nodular pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain

12,710-12,740 SILTY SANDSTONE: medium-dark gray brown, occasional light gray, trace cream-tan, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated and nodular pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain

12,740-12,770 SILTY SANDSTONE: medium-dark gray brown, occasional light gray, trace cream-tan, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated and nodular pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain

12,770-12,800 SILTY SANDSTONE: medium-dark gray brown, occasional light gray, trace cream-tan, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated and nodular pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain

12,800-12,830 SILTY SANDSTONE: light-medium gray brown, occasional light gray-light brown, trace cream-tan, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated and nodular pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain

12,830-12,860 SILTY SANDSTONE: light-medium gray brown, occasional light gray-light brown, trace cream-tan, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated and nodular pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain

12,860-12,890 SILTY SANDSTONE: light-medium gray brown, occasional light gray-light brown, trace cream-tan, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated and nodular pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain

12,890-12,920 SILTY SANDSTONE: light-medium brown, occasional light gray brown, trace cream-tan, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain

12,920-12,950 SILTY SANDSTONE: light-medium brown, occasional light gray brown, trace cream-tan, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain

12,950-12,980 SILTY SANDSTONE: light-medium brown, occasional light gray brown, trace cream-tan, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain

12,980-13,010 SILTY SANDSTONE: light-medium brown, occasional light gray brown, trace cream-tan, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately yellow streaming cut fluorescence

13,010-13,040 SILTY SANDSTONE: light-medium brown, occasional light gray brown, trace cream-tan, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately yellow streaming cut fluorescence

13,040-13,070 SILTY SANDSTONE: light-medium brown, occasional light gray brown, trace cream-tan, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately yellow streaming cut fluorescence

13,070-13,100 SILTY SANDSTONE: light-medium brown, occasional light gray brown, trace cream-tan, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately yellow streaming cut fluorescence

13,100-13,130 SILTY SANDSTONE: light-medium brown, occasional light gray brown, trace cream-tan, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately yellow streaming cut fluorescence

13,130-13,160 SILTY SANDSTONE: light-medium brown, occasional light gray brown, trace cream-tan, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately yellow streaming cut fluorescence

13,160-13,190 SILTY SANDSTONE: light-medium brown, occasional light gray brown, trace cream-tan, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately yellow streaming cut fluorescence

13,190-13,220 SILTY SANDSTONE: light brown, occasional light gray brown, occasional medium brown, trace cream-tan, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated pyrite and nodular pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately yellow streaming cut fluorescence

13,220-13,250 SILTY SANDSTONE: light brown, occasional light gray brown, occasional medium brown, trace cream-tan, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated pyrite and nodular pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately yellow streaming cut fluorescence

13,250-13,280 SILTY SANDSTONE: light brown, occasional light gray brown, occasional medium brown, trace cream-tan, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated pyrite and nodular pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately yellow streaming cut fluorescence

13,280-13,310 SILTY SANDSTONE: light brown, occasional light gray brown, occasional medium brown, trace cream-tan, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated pyrite and nodular pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately yellow streaming cut fluorescence

13,310-13,340 SILTY SANDSTONE: light brown, occasional light gray brown, occasional medium brown, trace cream-tan, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace

disseminated pyrite and nodular pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately yellow streaming cut fluorescence

13,340-13,370 SILTY SANDSTONE: light brown, occasional light gray brown, occasional medium brown, trace cream-tan, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated pyrite and nodular pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately yellow streaming cut fluorescence

13,370-13,400 SILTY SANDSTONE: light brown, occasional light gray brown, occasional medium brown, trace cream-tan, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated pyrite and nodular pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately yellow streaming cut fluorescence

13,400-13,430 SILTY SANDSTONE: light brown, occasional light gray brown, occasional medium brown, trace cream-tan, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated pyrite and nodular pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately yellow streaming cut fluorescence

13,430-13,460 SILTY SANDSTONE: light brown, occasional light gray brown, occasional medium brown, trace cream-tan, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated pyrite and nodular pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately yellow streaming cut fluorescence

13,460-13,490 SILTY SANDSTONE: light brown, occasional light gray brown, occasional medium brown, trace cream-tan, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated pyrite and nodular pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately yellow streaming cut fluorescence

13,490-13,520 SILTY SANDSTONE: light brown, occasional light gray brown, occasional medium brown, trace cream-tan, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated pyrite and nodular pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately yellow streaming cut fluorescence

13,520-13,550 SILTY SANDSTONE: light brown, occasional light gray brown, occasional medium brown, trace cream-tan, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated pyrite and nodular pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately yellow streaming cut fluorescence

13,550-13,580 SILTY SANDSTONE: light brown, occasional light gray brown, occasional medium brown, trace cream-tan, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated pyrite and nodular pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately yellow streaming cut fluorescence

13,580-13,610 SILTY SANDSTONE: light brown, occasional light gray brown, occasional medium brown, trace cream-tan, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated pyrite and nodular pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately yellow streaming cut fluorescence

13,610-13,640 SILTY SANDSTONE: light brown-light gray brown, occasional medium brown, trace light gray, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated and nodular pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately green yellow streaming cut fluorescence

13,640-13,670 SILTY SANDSTONE: light brown-light gray brown, occasional medium brown, trace light gray, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated and nodular pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately green yellow streaming cut fluorescence

13,670-13,700 SILTY SANDSTONE: light brown-light gray brown, occasional medium brown, trace light gray, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated and nodular pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately green yellow streaming cut fluorescence

13,700-13,730 SILTY SANDSTONE: light brown-light gray brown, occasional medium brown, trace light gray, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated and nodular pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately green yellow streaming cut fluorescence

13,730-13,760 SILTY SANDSTONE: light brown-light gray brown, occasional medium brown, trace light gray, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated and nodular pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately green yellow streaming cut fluorescence

13,760-13,790 SILTY SANDSTONE: light brown-light gray brown, occasional medium brown, trace light gray, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated and nodular pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately green yellow streaming cut fluorescence

13,790-13,820 SILTY SANDSTONE: light brown-light gray brown, occasional medium brown, trace light gray, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated and nodular pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately green yellow streaming cut fluorescence

13,820-13,850 SILTY SANDSTONE: light brown-light gray brown, occasional medium brown, trace light gray, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated and nodular pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately green yellow streaming cut fluorescence

13,850-13,880 SILTY SANDSTONE: light brown-light gray brown, occasional medium brown, trace light gray, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated and nodular pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately green yellow streaming cut fluorescence

13,880-13,910 SILTY SANDSTONE: light brown-light gray brown, occasional medium brown, trace light gray, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated and nodular pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately green yellow streaming cut fluorescence

13,910-13,940 SILTY SANDSTONE: light brown-light gray brown, occasional medium brown, trace light gray, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated and nodular pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately green yellow streaming cut fluorescence

13,940-13,970 SILTY SANDSTONE: light brown-light gray brown, occasional medium brown, trace light gray, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated and nodular pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately green yellow streaming cut fluorescence

13,970-14,000 SILTY SANDSTONE: light brown-light gray brown, occasional medium brown, trace light gray, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated and nodular pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately green yellow streaming cut fluorescence

14,000-14,030 SILTY SANDSTONE: light brown-light gray brown, occasional medium brown, trace light gray, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated and

nodular pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately green yellow streaming cut fluorescence

14,030-14,060 SILTY SANDSTONE: light brown-light gray brown, occasional medium brown, trace light gray, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated and nodular pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately green yellow streaming cut fluorescence

14,060-14,090 SILTY SANDSTONE: light brown-light gray brown, occasional medium brown, trace light gray, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated and nodular pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately green yellow streaming cut fluorescence

14,090-14,120 SILTY SANDSTONE: light brown-light gray brown, occasional medium brown, trace light gray, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated and nodular pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately green yellow streaming cut fluorescence

14,120-14,150 SILTY SANDSTONE: medium brown-light gray brown, rare light-medium gray, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated and nodular pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately green yellow streaming cut fluorescence

14,150-14,180 SILTY SANDSTONE: medium brown-light gray brown, rare light-medium gray, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated and nodular pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately green yellow streaming cut fluorescence

14,180-14,210 SILTY SANDSTONE: medium brown-light gray brown, rare light-medium gray, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated and nodular pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately green yellow streaming cut fluorescence

14,210-14,240 SILTY SANDSTONE: medium brown-light gray brown, rare light-medium gray, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated and nodular pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately green yellow streaming cut fluorescence

14,240-14,270 SILTY SANDSTONE: medium brown-light gray brown, rare light-medium gray, trace dark brown, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated and nodular pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately green yellow streaming cut fluorescence

14,270-14,300 SILTY SANDSTONE: medium brown-light gray brown, rare light-medium gray, trace dark brown, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated and nodular pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately green yellow streaming cut fluorescence

14,300-14,330 SILTY SANDSTONE: medium brown-light gray brown, rare light-medium gray, trace dark brown, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated and nodular pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately green yellow streaming cut fluorescence

14,330-14,360 SILTY SANDSTONE: medium brown-light gray brown, rare light-medium gray, trace dark brown, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated and nodular pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately green yellow streaming cut fluorescence

14,360-14,390 SILTY SANDSTONE: medium brown-light gray brown, rare light-medium gray, trace cream, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated and nodular pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately green yellow streaming cut fluorescence

14,390-14,420 SILTY SANDSTONE: medium brown-light gray brown, rare light-medium gray, trace cream, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated and nodular pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately green yellow streaming cut fluorescence

14,420-14,450 SILTY SANDSTONE: medium brown-light gray brown, rare light-medium gray, trace cream, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated and nodular pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately green yellow streaming cut fluorescence

14,450-14,480 SILTY SANDSTONE: medium brown-light gray brown, rare light-medium gray, trace cream, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated and nodular pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately green yellow streaming cut fluorescence

14,480-14,510 SILTY SANDSTONE: medium-dark brown, rare light-medium gray, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated and nodular pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately green yellow streaming cut fluorescence

14,510-14,540 SILTY SANDSTONE: medium-dark brown, rare light-medium gray, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated and nodular pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately green yellow streaming cut fluorescence

14,540-14,570 SILTY SANDSTONE: medium-dark brown, occasional light-medium gray, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated and nodular pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately green yellow streaming cut fluorescence

14,570-14,600 SILTY SANDSTONE: medium-dark brown, occasional light-medium gray, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated and nodular pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately green yellow streaming cut fluorescence

14,600-14,630 SILTY SANDSTONE: medium-dark brown, rare light-medium gray, trace tan-cream, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated and nodular pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately green yellow streaming cut fluorescence

14,630-14,660 SILTY SANDSTONE: medium-dark brown, rare light-medium gray, trace tan-cream, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated and nodular pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately green yellow streaming cut fluorescence

14,660-14,690 SILTY SANDSTONE: medium-dark brown, rare light-medium gray, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated and nodular pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately green yellow streaming cut fluorescence

14,690-14,720 SILTY SANDSTONE: medium-dark brown, rare light-medium gray, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated and nodular pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately green yellow streaming cut fluorescence

14,720-14,750 SILTY SANDSTONE: medium-dark brown, rare light-medium gray, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated and nodular pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately green yellow streaming cut fluorescence

14,750-14,780 SILTY SANDSTONE: medium-dark brown, rare light-medium gray, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated and nodular pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately green yellow streaming cut fluorescence

14,780-14,810 SILTY SANDSTONE: medium brown gray, rare light-medium gray, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated and nodular pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately green yellow streaming cut fluorescence

14,810-14,840 SILTY SANDSTONE: medium brown gray, rare light-medium gray, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated and nodular pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately green yellow streaming cut fluorescence

14,840-14,870 SILTY SANDSTONE: medium brown gray, rare light-medium gray, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated and nodular pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately green yellow streaming cut fluorescence

14,870-14,900 SILTY SANDSTONE: medium brown gray, rare light-medium gray, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated and nodular pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately green yellow streaming cut fluorescence

14,900-14,930 SILTY SANDSTONE: medium brown gray, rare light-medium gray, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated and nodular pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately green yellow streaming cut fluorescence

14,930-14,960 SILTY SANDSTONE: medium brown gray, rare light-medium gray, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated and nodular pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately green yellow streaming cut fluorescence

14,960-14,990 SILTY SANDSTONE: medium brown gray, occasional light-medium gray, trace cream, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated and nodular pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately green yellow streaming cut fluorescence

14,990-15,020 SILTY SANDSTONE: medium brown gray, occasional light-medium gray, trace cream, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated and nodular pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately green yellow streaming cut fluorescence

15,020-15,050 SILTY SANDSTONE: medium brown gray, occasional light-medium gray, trace cream, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated and nodular pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately green yellow streaming cut fluorescence

15,050-15,080 SILTY SANDSTONE: medium brown gray, occasional light-medium gray, trace cream, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated and nodular pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately green yellow streaming cut fluorescence

15,080-15,110 SILTY SANDSTONE: medium brown gray, occasional light-medium gray, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated and nodular pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately green yellow streaming cut fluorescence

15,110-15,140 SILTY SANDSTONE: medium brown gray, occasional light-medium gray, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated and nodular pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately green yellow streaming cut fluorescence

15,140-15,170 SILTY SANDSTONE: light gray brown, occasional light-medium gray, rare cream off white, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated and nodular pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately green yellow streaming cut fluorescence

15,170-15,200 SILTY SANDSTONE: light gray brown, occasional light-medium gray, rare cream off white, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated and nodular pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately green yellow streaming cut fluorescence

15,200-15,230 SILTY SANDSTONE: medium brown gray, occasional light-medium gray, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated and nodular pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately green yellow streaming cut fluorescence

15,230-15,260 SILTY SANDSTONE: medium brown gray, occasional light-medium gray, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated and nodular pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately green yellow streaming cut fluorescence

15,260-15,290 SILTY SANDSTONE: light-medium brown, occasional light-medium brown gray, rare tan, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated and nodular pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately green yellow streaming cut fluorescence

15,290-15,320 SILTY SANDSTONE: light-medium brown, occasional light-medium brown gray, rare tan, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated and nodular pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately green yellow streaming cut fluorescence

15,320-15,350 SILTY SANDSTONE: light-medium brown, occasional light-medium brown gray, rare tan, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated and nodular pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately green yellow streaming cut fluorescence

15,350-15,380 SILTY SANDSTONE: light-medium brown, occasional light-medium brown gray, rare tan, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated and nodular pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately green yellow streaming cut fluorescence

15,380-15,410 SILTY SANDSTONE: light-medium brown, occasional light-medium brown gray, rare tan, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated and nodular pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately green yellow streaming cut fluorescence

15,410-15,440 SILTY SANDSTONE: light-medium brown, occasional light-medium brown gray, rare tan, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated and nodular pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately green yellow streaming cut fluorescence

15,440-15,470 SILTY SANDSTONE: light-medium brown, occasional light-medium brown gray, rare tan, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated and nodular pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately green yellow streaming cut fluorescence

15,470-15,500 SILTY SANDSTONE: light-medium brown, occasional light-medium brown gray, rare tan, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated and nodular pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately green yellow streaming cut fluorescence

15,500-15,530 SILTY SANDSTONE: light-medium brown, occasional light-medium brown gray, rare tan, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated and nodular pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately green yellow streaming cut fluorescence

15,530-15,560 SILTY SANDSTONE: light-medium brown, occasional light-medium brown gray, rare tan, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated and nodular pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately green yellow streaming cut fluorescence

15,560-15,590 SILTY SANDSTONE: light-medium brown, occasional light-medium brown gray, rare tan, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated and nodular pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately green yellow streaming cut fluorescence

15,590-15,620 SILTY SANDSTONE: light-medium brown, occasional light-medium brown gray, rare tan, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated and nodular pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately green yellow streaming cut fluorescence

15,620-15,650 SILTY SANDSTONE: medium-light brown, occasional light-medium brown gray, rare tan and off white, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated, good intercrystalline porosity, common light-medium brown spotty oil stain; moderately yellow streaming cut fluorescence

15,650-15,680 SILTY SANDSTONE: medium-light brown, occasional light-medium brown gray, rare tan and off white, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated, good intercrystalline porosity, common light-medium brown spotty oil stain; moderately yellow streaming cut fluorescence

15,680-15,710 SILTY SANDSTONE: medium-light brown, occasional light-medium brown gray, rare tan and off white, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated, good intercrystalline porosity, common light-medium brown spotty oil stain; moderately yellow streaming cut fluorescence

15,710-15,740 SILTY SANDSTONE: medium-light brown, occasional light-medium brown gray, rare tan and off white, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated, good intercrystalline porosity, common light-medium brown spotty oil stain; moderately yellow streaming cut fluorescence

15,740-15,770 SILTY SANDSTONE: medium-light brown, occasional light-medium brown gray, rare tan and off white, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated, good intercrystalline porosity, common light-medium brown spotty oil stain; moderately yellow streaming cut fluorescence

15,770-15,800 SILTY SANDSTONE: medium-light brown, occasional light-medium brown gray, rare tan and off white, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated, good intercrystalline porosity, common light-medium brown spotty oil stain; moderately yellow streaming cut fluorescence

15,800-15,830 SILTY SANDSTONE: medium-light brown, occasional light-medium brown gray, rare tan and off white, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated, good intercrystalline porosity, common light-medium brown spotty oil stain; moderately yellow streaming cut fluorescence

15,830-15,860 SILTY SANDSTONE: medium-light brown, occasional light-medium brown gray, rare tan and off white, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated, good intercrystalline porosity, common light-medium brown spotty oil stain; moderately yellow streaming cut fluorescence

15,860-15,890 SILTY SANDSTONE: medium-light brown, occasional light-medium brown gray, rare tan and off white, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated, good intercrystalline porosity, common light-medium brown spotty oil stain; moderately yellow streaming cut fluorescence

15,890-15,920 SILTY SANDSTONE: medium-light brown, occasional light-medium brown gray, rare tan and off white, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated, good intercrystalline porosity, common light-medium brown spotty oil stain; moderately yellow streaming cut fluorescence

15,920-15,950 SILTY SANDSTONE: light brown, occasional light-medium brown gray, rare medium brown, tan and off white, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace

disseminated pyrite, good intercrystalline porosity, common light-medium brown spotty oil stain; moderately yellow green streaming cut fluorescence

15,950-15,980 SILTY SANDSTONE: light brown, occasional light-medium brown gray, rare medium brown, tan and off white, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated pyrite, good intercrystalline porosity, common light-medium brown spotty oil stain; moderately yellow green streaming cut fluorescence

16,010-16,040 SILTY SANDSTONE: light brown, occasional light-medium brown gray, rare medium brown, tan and off white, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated pyrite, good intercrystalline porosity, common light-medium brown spotty oil stain; moderately yellow green streaming cut fluorescence

15,980-16,010 SILTY SANDSTONE: light brown, occasional light-medium brown gray, rare medium brown, tan and off white, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated pyrite, good intercrystalline porosity, common light-medium brown spotty oil stain; moderately yellow green streaming cut fluorescence

16,040-16,070 SILTY SANDSTONE: light brown, occasional light-medium brown gray, rare medium brown, tan and off white, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated pyrite, good intercrystalline porosity, common light-medium brown spotty oil stain; moderately yellow green streaming cut fluorescence

16,070-16,100 SILTY SANDSTONE: light brown, occasional light-medium brown gray, rare medium brown, tan and off white, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated pyrite, good intercrystalline porosity, common light-medium brown spotty oil stain; moderately yellow green streaming cut fluorescence

16,100-16,130 SILTY SANDSTONE: light brown, occasional light-medium brown gray, rare medium brown, tan and off white, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated pyrite, good intercrystalline porosity, common light-medium brown spotty oil stain; moderately yellow green streaming cut fluorescence

16,130-16,160 SILTY SANDSTONE: light brown, occasional light-medium brown gray, rare medium brown, tan and off white, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated pyrite, good intercrystalline porosity, common light-medium brown spotty oil stain; moderately yellow green streaming cut fluorescence

16,160-16,190 SILTY SANDSTONE: light brown, occasional light-medium brown gray, rare medium brown, tan and off white, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated pyrite, good intercrystalline porosity, common light-medium brown spotty oil stain; moderately yellow green streaming cut fluorescence

16,190-16,220 SILTY SANDSTONE: light brown, occasional light-medium brown gray, rare medium brown, tan and off white, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated pyrite, good intercrystalline porosity, common light-medium brown spotty oil stain; moderately yellow green streaming cut fluorescence

16,220-16,250 SILTY SANDSTONE: light-medium brown, rare light-medium brown gray, trace tan-off white, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated pyrite, good intercrystalline porosity, common light-medium brown spotty oil stain; moderately yellow streaming cut fluorescence

16,250-16,280 SILTY SANDSTONE: light-medium brown, rare light-medium brown gray, trace tan-off white, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated pyrite, good intercrystalline porosity, common light-medium brown spotty oil stain; moderately yellow streaming cut fluorescence

16,280-16,310 SILTY SANDSTONE: light-medium brown, rare light-medium brown gray, trace tan-off white, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated pyrite, good intercrystalline porosity, common light-medium brown spotty oil stain; moderately yellow streaming cut fluorescence

16,310-16,340 SILTY SANDSTONE: light-medium brown, rare light-medium brown gray, trace tan-off white, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated pyrite, good intercrystalline porosity, common light-medium brown spotty oil stain; moderately yellow streaming cut fluorescence

16,340-16,470 SILTY SANDSTONE: light-medium brown, rare light-medium brown gray, trace tan-off white, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated pyrite, good intercrystalline porosity, common light-medium brown spotty oil stain; moderately yellow streaming cut fluorescence

16,370-16,400 SILTY SANDSTONE: light-medium brown, rare light-medium brown gray, trace tan-off white, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated pyrite, good intercrystalline porosity, common light-medium brown spotty oil stain; moderately yellow streaming cut fluorescence

16,400-16,430 SILTY SANDSTONE: light-medium brown, rare light-medium brown gray, trace tan-off white, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated pyrite, good intercrystalline porosity, common light-medium brown spotty oil stain; moderately yellow streaming cut fluorescence

16,430-16,460 SILTY SANDSTONE: light-medium brown, rare light-medium brown gray, trace tan-off white, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated pyrite, good intercrystalline porosity, common light-medium brown spotty oil stain; moderately yellow streaming cut fluorescence

16,460-16,490 SILTY SANDSTONE: light-medium brown, rare light-medium brown gray, trace tan-off white, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated pyrite, good intercrystalline porosity, common light-medium brown spotty oil stain; moderately yellow streaming cut fluorescence

16,490-16,520 SILTY SANDSTONE: light-medium brown, rare light-medium brown gray, trace tan-off white, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated pyrite, good intercrystalline porosity, common light-medium brown spotty oil stain; moderately yellow streaming cut fluorescence

16,520-16,550 SILTY SANDSTONE: light-medium gray brown, occasional light-medium brown, rare tan and off white, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated and nodular pyrite, good intercrystalline porosity, common light-medium brown spotty oil stain; moderately yellow streaming cut fluorescence

16,550-16,580 SILTY SANDSTONE: light-medium gray brown, occasional light-medium brown, rare tan and off white, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated and nodular pyrite, good intercrystalline porosity, common light-medium brown spotty oil stain; moderately yellow streaming cut fluorescence

16,580-16,610 SILTY SANDSTONE: light-medium gray brown, occasional light-medium brown, rare tan and off white, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated and nodular pyrite, good intercrystalline porosity, common light-medium brown spotty oil stain; moderately yellow streaming cut fluorescence

16,610-16,640 SILTY SANDSTONE: light-medium gray brown, occasional light-medium brown, rare tan and off white, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated and nodular pyrite, good intercrystalline porosity, common light-medium brown spotty oil stain; moderately yellow streaming cut fluorescence

16,640-16,670 SILTY SANDSTONE: light-medium gray brown, occasional light-medium brown, rare tan and off white, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated and nodular pyrite, good intercrystalline porosity, common light-medium brown spotty oil stain; moderately yellow streaming cut fluorescence

16,670-16,700 SILTY SANDSTONE: light-medium gray brown, occasional light-medium brown, rare tan and off white, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated and nodular pyrite, good intercrystalline porosity, common light-medium brown spotty oil stain; moderately yellow streaming cut fluorescence

16,700-16,730 SILTY SANDSTONE: light-medium gray brown, occasional light-medium brown, rare tan and off white, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated and nodular pyrite, good intercrystalline porosity, common light-medium brown spotty oil stain; moderately yellow streaming cut fluorescence

16,730-16,760 SILTY SANDSTONE: light-medium gray brown, occasional light-medium brown, rare light gray, rare tan and off white, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, rare disseminated pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately yellow streaming cut fluorescence

16,760-16,790 SILTY SANDSTONE: light-medium gray brown, occasional light-medium brown, rare light gray, rare tan and off white, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, rare disseminated pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately yellow streaming cut fluorescence

16,790-16,820 SILTY SANDSTONE: light-medium gray brown, occasional light-medium brown, rare light gray, rare tan and off white, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, rare disseminated pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately yellow streaming cut fluorescence

16,820-16,850 SILTY SANDSTONE: light-medium gray brown, occasional light-medium brown, rare light gray, rare tan and off white, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, rare disseminated pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately yellow streaming cut fluorescence

16,850-16,880 SILTY SANDSTONE: light-medium gray brown, occasional light-medium brown, rare light gray, rare tan and off white, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, rare disseminated pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately yellow streaming cut fluorescence

16,880-16,910 SILTY SANDSTONE: light-medium gray brown, rare light gray, trace tan and off white, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, rare disseminated pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately yellow streaming cut fluorescence

16,910-16,940 SILTY SANDSTONE: light-medium gray brown, rare light gray, trace tan and off white, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, rare disseminated pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately yellow streaming cut fluorescence

16,940-16,970 SILTY SANDSTONE: light-medium gray brown, rare light gray, trace tan and off white, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, rare disseminated pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately yellow streaming cut fluorescence

16,970-17,000 SILTY SANDSTONE: light-medium gray brown, rare light gray, trace tan and off white, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, rare disseminated pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately yellow streaming cut fluorescence

17,000-17,030 SILTY SANDSTONE: light-medium gray brown, rare light gray, rare tan, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, rare disseminated pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately yellow streaming cut fluorescence

17,030-17,060 SILTY SANDSTONE: light-medium gray brown, rare light gray, rare tan, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, rare disseminated pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately yellow streaming cut fluorescence

17,060-17,090 SILTY SANDSTONE: light-medium gray brown, rare light gray, rare tan, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, rare disseminated pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately yellow streaming cut fluorescence

17,090-17,120 SILTY SANDSTONE: light-medium gray brown, rare light gray, rare tan, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, rare disseminated pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately yellow streaming cut fluorescence

17,120-17,150 SILTY SANDSTONE: light-medium gray brown, rare light gray, rare tan, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, rare disseminated pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately yellow streaming cut fluorescence

17,150-17,180 SILTY SANDSTONE: light-medium gray brown, rare light gray, rare tan, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, rare disseminated pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately yellow streaming cut fluorescence

17,180-17,210 SILTY SANDSTONE: light-medium gray brown, rare light gray, rare tan, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, rare disseminated pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately yellow streaming cut fluorescence

17,210-17,240 SILTY SANDSTONE: light-medium gray brown, rare light gray, rare tan, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, rare disseminated pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately yellow streaming cut fluorescence

17,240-17,270 SILTY SANDSTONE: light-medium gray brown, rare light gray, rare tan, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, rare disseminated pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately yellow streaming cut fluorescence

17,270-17,300 SILTY SANDSTONE: light-medium gray brown, rare light gray, rare tan, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, rare disseminated pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately yellow streaming cut fluorescence

17,300-17,330 SILTY SANDSTONE: light-medium gray brown, occasional light gray, rare cream-of white, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, rare disseminated pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately yellow streaming cut fluorescence

17,330-17,360 SILTY SANDSTONE: light-medium gray brown, occasional light gray, rare cream-of white, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, rare disseminated pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately yellow streaming cut fluorescence

17,360-17,390 SILTY SANDSTONE: light-medium gray brown, occasional light gray, rare cream-of white, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, rare disseminated pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately yellow streaming cut fluorescence

17,390-17,420 SILTY SANDSTONE: light-medium gray brown, occasional light gray, rare cream-of white, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, rare disseminated pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately yellow streaming cut fluorescence

17,420-17,450 SILTY SANDSTONE: light gray brown, occasional light gray, rare cream-of white, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, rare disseminated pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately yellow streaming cut fluorescence

17,450-17,480 SILTY SANDSTONE: light gray brown, occasional light gray, rare cream-of white, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, rare disseminated pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately yellow streaming cut fluorescence

17,480-17,510 SILTY SANDSTONE: light gray brown, occasional light gray, rare cream-of white, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, rare disseminated pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately yellow streaming cut fluorescence

17,510-17,540 SILTY SANDSTONE: light gray brown, occasional light gray, rare cream-of white, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, rare disseminated pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately yellow streaming cut fluorescence

17,540-17,570 SILTY SANDSTONE: light-medium gray, occasional light gray brown, rare cream-of white, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, rare disseminated pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately yellow streaming cut fluorescence

17,570-17,600 SILTY SANDSTONE: light-medium gray, occasional light gray brown, rare cream-of white, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, rare disseminated pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately yellow streaming cut fluorescence

17,600-17,630 SILTY SANDSTONE: light gray-tan, common light gray, occasional cream-of white, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, rare disseminated pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately yellow streaming cut fluorescence

17,630-17,660 SILTY SANDSTONE: light gray-tan, common light gray, occasional cream-of white, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, rare disseminated pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately yellow streaming cut fluorescence

17,660-17,690 SILTY SANDSTONE: light gray-tan, common light gray, occasional cream-of white, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, rare disseminated pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately yellow streaming cut fluorescence

17,690-17,720 SILTY SANDSTONE: light gray-tan, common light gray, occasional cream-of white, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, rare disseminated pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately yellow streaming cut fluorescence

17,720-17,750 SILTY SANDSTONE: light gray-tan, common light gray, occasional cream-of white, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, rare disseminated pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately yellow streaming cut fluorescence

17,750-17,780 SILTY SANDSTONE: light gray-tan, common light gray, occasional cream-of white, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, rare disseminated pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately yellow streaming cut fluorescence

17,780-17,810 SILTY SANDSTONE: light gray-tan, common light gray, occasional cream-of white, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, rare disseminated pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately yellow streaming cut fluorescence

17,810-17,840 SILTY SANDSTONE: light gray-tan, common light gray, occasional cream-of white, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, rare disseminated pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately yellow streaming cut fluorescence

17,840-17,870 SILTY SANDSTONE: light gray-tan, common light gray, occasional cream-of white, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, rare disseminated pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately yellow streaming cut fluorescence

17,870-17,900 SILTY SANDSTONE: light gray-tan, common light gray, occasional cream-of white, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, rare disseminated pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately yellow streaming cut fluorescence

17,900-17,930 SILTY SANDSTONE: light gray-tan, common light gray, occasional cream-of white, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, rare disseminated pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately yellow streaming cut fluorescence

17,930-17,960 SILTY SANDSTONE: light gray brown-light brown, common light gray, occasional tan-off white, occasional medium brown, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately

cemented, rare disseminated pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately yellow streaming cut fluorescence

17,960-17,990 SILTY SANDSTONE: light gray brown-light brown, common light gray, occasional tan-off white, occasional medium brown, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, rare disseminated pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately yellow streaming cut fluorescence

17,990-18,020 SILTY SANDSTONE: light gray brown-light brown, common light gray, occasional tan-off white, occasional medium brown, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, rare disseminated pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately yellow streaming cut fluorescence

18,020-18,050 SILTY SANDSTONE: light gray brown-light brown, common light gray, occasional tan-off white, occasional medium brown, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, rare disseminated pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately yellow streaming cut fluorescence

18,050-18,080 SILTY SANDSTONE: light gray brown-light brown, common light gray, occasional tan-off white, occasional medium brown, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, rare disseminated pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately yellow streaming cut fluorescence

18,080-18,110 SILTY SANDSTONE: light gray brown-light brown, common light gray, occasional tan-off white, occasional medium brown, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, rare disseminated pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately yellow streaming cut fluorescence

18,110-18,140 SILTY SANDSTONE: light gray brown-light brown, common light gray, occasional tan-off white, occasional medium brown, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, rare disseminated pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately yellow streaming cut fluorescence

18,140-18,170 SILTY SANDSTONE: light gray brown-light brown, common light gray, occasional tan-off white, occasional medium brown, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, rare disseminated pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately yellow streaming cut fluorescence

18,170-18,200 SILTY SANDSTONE: light gray brown-light brown, common light gray, occasional tan-off white, occasional medium brown, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, rare disseminated pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately yellow streaming cut fluorescence

18,200-18,230 SILTY SANDSTONE: light gray brown-light brown, common light gray, occasional tan-off white, occasional medium brown, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, rare disseminated pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately yellow streaming cut fluorescence

18,230-18,260 SILTY SANDSTONE: light gray brown-light brown, common light gray, occasional tan-off white, occasional medium brown, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, rare disseminated pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately yellow streaming cut fluorescence

18,260-18,290 SILTY SANDSTONE: light gray brown-light brown, common light gray, occasional tan-off white, occasional medium brown, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, rare disseminated pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately yellow streaming cut fluorescence

18,290-18,320 SILTY SANDSTONE: light gray brown-light brown, common light gray, occasional tan-off white, occasional medium brown, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, rare disseminated pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately yellow streaming cut fluorescence

18,320-18,350 SILTY SANDSTONE: light-medium brown, common light-medium brown gray, trace tan-off white, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately yellow green streaming cut fluorescence

18,350-18,380 SILTY SANDSTONE: light-medium brown, common light-medium brown gray, trace tan-off white, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately yellow green streaming cut fluorescence

18,380-18,410 SILTY SANDSTONE: light-medium brown, common light-medium brown gray, trace tan-off white, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately yellow green streaming cut fluorescence

18,410-18,440 SILTY SANDSTONE: light-medium brown, common light-medium brown gray, trace tan-off white, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately yellow green streaming cut fluorescence

18,440-18,470 SILTY SANDSTONE: light-medium brown, common light-medium brown gray, trace tan-off white, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately yellow green streaming cut fluorescence

18,470-18,500 SILTY SANDSTONE: light-medium brown, common light-medium brown gray, trace tan-off white, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately yellow green streaming cut fluorescence

18,500-18,530 SILTY SANDSTONE: light-medium brown, common light-medium brown gray, trace tan-off white, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately yellow green streaming cut fluorescence

18,530-18,560 SILTY SANDSTONE: light-medium brown, common light-medium brown gray, trace tan-off white, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately yellow green streaming cut fluorescence

18,560-18,590 SILTY SANDSTONE: light-medium brown, common light-medium brown gray, trace tan-off white, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately yellow green streaming cut fluorescence

18,590-18,620 SILTY SANDSTONE: light-medium brown, common light-medium brown gray, trace tan-off white, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately yellow green streaming cut fluorescence

18,620-18,650 SILTY SANDSTONE: medium-light brown, occasional light brown gray, trace tan-off white, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated pyrite,

good intercrystalline porosity, common light-medium brown spotty oil stain; moderately yellow green streaming cut fluorescence

18,650-18,680 SILTY SANDSTONE: medium-light brown, occasional light brown gray, trace tan-off white, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated pyrite, good intercrystalline porosity, common light-medium brown spotty oil stain; moderately yellow green streaming cut fluorescence

18,680-18,710 SILTY SANDSTONE: medium-light brown, occasional light brown gray, trace tan-off white, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated pyrite, good intercrystalline porosity, common light-medium brown spotty oil stain; moderately yellow green streaming cut fluorescence

18,710-18,740 SILTY SANDSTONE: medium-light brown, occasional light brown gray, trace tan-off white, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated pyrite, good intercrystalline porosity, common light-medium brown spotty oil stain; moderately yellow green streaming cut fluorescence

18,740-18,770 SILTY SANDSTONE: medium-light brown, occasional light brown gray, trace tan-off white, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated pyrite, good intercrystalline porosity, common light-medium brown spotty oil stain; moderately yellow green streaming cut fluorescence

18,770-18,800 SILTY SANDSTONE: medium-light brown, occasional light brown gray, trace tan-off white, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated pyrite, good intercrystalline porosity, common light-medium brown spotty oil stain; moderately yellow green streaming cut fluorescence

18,800-18,830 SILTY SANDSTONE: medium-light brown, occasional light brown gray, trace tan-off white, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated pyrite, good intercrystalline porosity, common light-medium brown spotty oil stain; moderately yellow green streaming cut fluorescence

18,830-18,860 SILTY SANDSTONE: medium-light brown, occasional light brown gray, trace tan-off white, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated pyrite, good intercrystalline porosity, common light-medium brown spotty oil stain; moderately yellow green streaming cut fluorescence

18,860-18,890 SILTY SANDSTONE: medium-light brown, occasional light brown gray, trace tan-off white, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated pyrite, good intercrystalline porosity, common light-medium brown spotty oil stain; moderately yellow green streaming cut fluorescence

18,890-18,920 SILTY SANDSTONE: medium-light brown, occasional light brown gray, trace tan-off white, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated pyrite, good intercrystalline porosity, common light-medium brown spotty oil stain; moderately yellow green streaming cut fluorescence

18,920-18,950 SILTY SANDSTONE: medium-light brown, occasional light brown gray, trace tan-off white, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated pyrite, good intercrystalline porosity, common light-medium brown spotty oil stain; moderately yellow green streaming cut fluorescence

18,950-18,980 SILTY SANDSTONE: medium-light brown, occasional light brown gray, trace tan-off white, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated pyrite, good intercrystalline porosity, common light-medium brown spotty oil stain; moderately yellow green streaming cut fluorescence

18,980-19,010 SILTY SANDSTONE: medium-light brown, occasional light brown gray, trace tan-off white, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated pyrite, good intercrystalline porosity, common light-medium brown spotty oil stain; moderately yellow green streaming cut fluorescence

19,010-19,040 SILTY SANDSTONE: medium-light brown, occasional light brown gray, trace tan-off white, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated pyrite, good intercrystalline porosity, common light-medium brown spotty oil stain; moderately yellow green streaming cut fluorescence

19,040-19,070 SILTY SANDSTONE: light-medium gray brown, occasional gray, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated pyrite, good intercrystalline porosity, common light-medium brown spotty oil stain; moderately yellow green streaming cut fluorescence

19,070-19,100 SILTY SANDSTONE: light-medium gray brown, occasional gray, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated pyrite, good intercrystalline porosity, common light-medium brown spotty oil stain; moderately yellow green streaming cut fluorescence

19,100-19,130 SILTY SANDSTONE: light-medium gray brown, occasional gray, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated pyrite, good intercrystalline porosity, common light-medium brown spotty oil stain; moderately yellow green streaming cut fluorescence

19,130-19,160 SILTY SANDSTONE: light-medium gray brown, occasional gray, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated pyrite, good intercrystalline porosity, common light-medium brown spotty oil stain; moderately yellow green streaming cut fluorescence

19,160-19,190 SILTY SANDSTONE: light-medium gray brown, occasional gray, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated pyrite, good intercrystalline porosity, common light-medium brown spotty oil stain; moderately yellow green streaming cut fluorescence

19,190-19,220 SILTY SANDSTONE: light-medium gray brown, occasional gray, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated pyrite, good intercrystalline porosity, common light-medium brown spotty oil stain; moderately yellow green streaming cut fluorescence

19,220-19,250 SILTY SANDSTONE: light-medium gray brown, occasional gray, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated pyrite, good intercrystalline porosity, common light-medium brown spotty oil stain; moderately yellow green streaming cut fluorescence

19,250-19,280 SILTY SANDSTONE: light-medium gray brown, occasional gray, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated pyrite, good intercrystalline porosity, common light-medium brown spotty oil stain; moderately yellow green streaming cut fluorescence

19,280-19,310 SILTY SANDSTONE: light-medium gray brown, occasional gray, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated pyrite, good intercrystalline porosity, common light-medium brown spotty oil stain; moderately yellow green streaming cut fluorescence

19,310-19,340 SILTY SANDSTONE: light-medium gray brown, occasional gray, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated pyrite, good intercrystalline porosity, common light-medium brown spotty oil stain; moderately yellow green streaming cut fluorescence

19,340-19,370 SILTY SANDSTONE: light-medium gray brown, occasional gray, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated pyrite, good intercrystalline porosity, common light-medium brown spotty oil stain; moderately yellow green streaming cut fluorescence

19,370-19,400 SILTY SANDSTONE: light-medium gray brown, occasional gray, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated pyrite, good intercrystalline porosity, common light-medium brown spotty oil stain; moderately yellow green streaming cut fluorescence

19,400-19,430 SILTY SANDSTONE: light-medium gray brown, occasional light gray, rare cream, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated pyrite, good intercrystalline porosity, common light-medium brown spotty oil stain; moderately yellow green streaming cut fluorescence

19,430-19,460 SILTY SANDSTONE: light-medium gray brown, occasional light gray, rare cream, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated pyrite, good intercrystalline porosity, common light-medium brown spotty oil stain; moderately yellow green streaming cut fluorescence

19,460-19,490 SILTY SANDSTONE: light-medium gray brown, occasional light gray, rare cream, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated pyrite, good intercrystalline porosity, common light-medium brown spotty oil stain; moderately yellow green streaming cut fluorescence

19,490-19,520 SILTY SANDSTONE: light-medium gray brown, occasional light gray, rare cream, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated pyrite, good intercrystalline porosity, common light-medium brown spotty oil stain; moderately yellow green streaming cut fluorescence

19,520-19,550 SILTY SANDSTONE: light-medium gray brown, occasional light gray, rare cream, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated pyrite, good intercrystalline porosity, common light-medium brown spotty oil stain; moderately yellow green streaming cut fluorescence

19,550-19,580 SILTY SANDSTONE: light-medium gray brown, occasional light gray, rare cream, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated pyrite, good intercrystalline porosity, common light-medium brown spotty oil stain; moderately yellow green streaming cut fluorescence

19,580-19,610 SILTY SANDSTONE: light-medium gray brown, occasional light gray, rare cream, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated pyrite, good intercrystalline porosity, common light-medium brown spotty oil stain; moderately yellow green streaming cut fluorescence

19,610-19,640 SILTY SANDSTONE: light-medium gray brown, occasional light gray, rare cream, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated pyrite, good intercrystalline porosity, common light-medium brown spotty oil stain; moderately yellow green streaming cut fluorescence

19,640-19,670 SILTY SANDSTONE: light-medium gray, occasional light gray brown, rare cream-off white, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated pyrite, good intercrystalline porosity, common light-medium brown spotty oil stain; moderately yellow green streaming cut fluorescence

19,670-19,700 SILTY SANDSTONE: light-medium gray, occasional light gray brown, rare cream-off white, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated pyrite, good intercrystalline porosity, common light-medium brown spotty oil stain; moderately yellow green streaming cut fluorescence

19,700-19,730 SILTY SANDSTONE: light-medium gray, occasional light gray brown, rare cream-off white, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated pyrite, good intercrystalline porosity, common light-medium brown spotty oil stain; moderately yellow green streaming cut fluorescence

19,730-19,760 SILTY SANDSTONE: light-medium gray, occasional light gray brown, rare cream-off white, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated pyrite, good intercrystalline porosity, common light-medium brown spotty oil stain; moderately yellow green streaming cut fluorescence

19,760-19,790 SILTY SANDSTONE: light-medium gray, occasional light gray brown, rare cream-off white, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated pyrite, good intercrystalline porosity, common light-medium brown spotty oil stain; moderately yellow green streaming cut fluorescence

19,790-19,820 SILTY SANDSTONE: light-medium gray, occasional light gray brown, rare cream-off white, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated pyrite, good intercrystalline porosity, common light-medium brown spotty oil stain; moderately yellow green streaming cut fluorescence

19,820-19,850 SILTY SANDSTONE: light-medium brown gray, occasional light brown-tan, trace cream-off white, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately yellow green streaming cut fluorescence

19,850-19,880 LTY SANDSTONE: light-medium brown gray, occasional light brown-tan, trace cream-off white, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately yellow green streaming cut fluorescence

19,880-19,910 SILTY SANDSTONE: light-medium brown gray, occasional light brown-tan, trace cream-off white, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated pyrite, good intercrystalline porosity, occasional light-medium brown spotty oil stain; moderately yellow green streaming cut fluorescence

19,910-19,940 SILTY SANDSTONE: light-medium brown, occasional light brown gray, rare tan, trace cream-off white, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, rare disseminated pyrite, good intercrystalline porosity, common light-medium brown spotty oil stain; moderately yellow streaming cut fluorescence

19,940-19,970 SILTY SANDSTONE: light-medium brown, occasional light brown gray, rare tan, trace cream-off white, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, rare disseminated pyrite, good intercrystalline porosity, common light-medium brown spotty oil stain; moderately yellow streaming cut fluorescence

19,970-20,000 SILTY SANDSTONE: light-medium brown, occasional light brown gray, rare tan, trace cream-off white, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, rare disseminated pyrite, good intercrystalline porosity, common light-medium brown spotty oil stain; moderately yellow streaming cut fluorescence

20,000-20,030 SILTY SANDSTONE: light-medium brown, occasional light brown gray, rare tan, trace cream-off white, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, rare disseminated pyrite, good intercrystalline porosity, common light-medium brown spotty oil stain; moderately yellow streaming cut fluorescence

20,030-20,060 SILTY SANDSTONE: light-medium brown, occasional light brown gray, rare tan, trace cream-off white, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, rare disseminated pyrite, good intercrystalline porosity, common light-medium brown spotty oil stain; moderately yellow streaming cut fluorescence

20,060-20,090 SILTY SANDSTONE: light-medium brown, occasional light brown gray, rare tan, trace cream-off white, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, rare disseminated pyrite, good intercrystalline porosity, common light-medium brown spotty oil stain; moderately yellow streaming cut fluorescence

20,090-20,120 SILTY SANDSTONE: light-medium brown, occasional light brown gray, rare tan, trace cream-off white, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, rare disseminated pyrite, good intercrystalline porosity, common light-medium brown spotty oil stain; moderately yellow streaming cut fluorescence

20,120-20,150 SILTY SANDSTONE: light-medium brown, occasional light brown gray, rare tan, trace cream-off white, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, rare disseminated

pyrite, good intercrystalline porosity, common light-medium brown spotty oil stain; moderately yellow streaming cut fluorescence

20,150-20,180 SILTY SANDSTONE: light brown, occasional light brown gray, rare medium brown and tan, trace cream-off white, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated pyrite, good intercrystalline porosity, common light-medium brown spotty oil stain; moderately green yellow streaming cut fluorescence

20,180-20,210 SILTY SANDSTONE: light brown, occasional light brown gray, rare medium brown and tan, trace cream-off white, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated pyrite, good intercrystalline porosity, common light-medium brown spotty oil stain; moderately green yellow streaming cut fluorescence

20,210-20,240 SILTY SANDSTONE: light brown, occasional light brown gray, rare medium brown and tan, trace cream-off white, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated pyrite, good intercrystalline porosity, common light-medium brown spotty oil stain; moderately green yellow streaming cut fluorescence

20,240-20,270 SILTY SANDSTONE: light brown, occasional light brown gray, rare medium brown and tan, trace cream-off white, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated pyrite, good intercrystalline porosity, common light-medium brown spotty oil stain; moderately green yellow streaming cut fluorescence

20,270-20,300 SILTY SANDSTONE: light brown, occasional light brown gray, rare medium brown and tan, trace cream-off white, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated pyrite, good intercrystalline porosity, common light-medium brown spotty oil stain; moderately green yellow streaming cut fluorescence

20,300-20,330 SILTY SANDSTONE: light brown, occasional light brown gray, rare medium brown and tan, trace cream-off white, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated pyrite, good intercrystalline porosity, common light-medium brown spotty oil stain; moderately green yellow streaming cut fluorescence

20,330-20,360 SILTY SANDSTONE: light brown, occasional light brown gray, rare medium brown and tan, trace cream-off white, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated pyrite, good intercrystalline porosity, common light-medium brown spotty oil stain; moderately green yellow streaming cut fluorescence

20,360-20,395 SILTY SANDSTONE: light brown, occasional light brown gray, rare medium brown and tan, trace cream-off white, very fine grained, friable, sub rounded, smooth, moderately sorted, calcite cement, moderately cemented, trace disseminated pyrite, good intercrystalline porosity, common light-medium brown spotty oil stain; moderately green yellow streaming cut fluorescence

ENSECO
Directional Drilling

Directional Survey Certification

Operator: Oasis Petroleum LLC **Well Name:** Kline Federal 5300 31-18 8B **API:** 33-053-06055

Enseco Job#: S15074-02 **Job Type:** MWD D&I **County, State:** McKenzie County, N. Dakota

Well Surface Hole Location (SHL): Lot 3, Sec. 18, T153N, R100W (2523' FSL & 238 FWL)

Latitude: 48° 04' 28.160 N **Longitude:** 103° 36' 11.380 W **Datum:** Nad 83

Final MWD Report Date: Feb. 30, 2015 **MWD Survey Run Date:** Feb. 19, 2015 to Feb. 20, 2015

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

MWD Surveyed from 00 **ft to** 2,059.0 **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 8B
Job # S15074-02
API#: 33-053-06055

Survey: Final Surveys Vertical Section

ENSECO Energy Services

Survey Report

Company:	Oasis Petroleum LLC	**Local Co-ordinate Reference:**	Well Kline Federal 5300 31-18 8B
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 8B	**North Reference:**	True
Wellbore:	Job # S15074-02	**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 8B | API#: 33-053-06055

Well Position	**+N/-S**	0.00 usft	**Northing:**	407,221.74 usft	**Latitude:**	48° 4' 28.160 N
	+E/-W	0.00 usft	**Easting:**	1,210,091.04 usft	**Longitude:**	103° 36' 11.380 W
Position Uncertainty		0.00 usft	**Wellhead Elevation:**	usft	**Ground Level:**	2,026.00usft

Wellbore Job # S15074-02

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	86.46

ENSECO Energy Services

Survey Report

Company:	Oasis Petroleum LLC	**Local Co-ordinate Reference:**	Well Kline Federal 5300 31-18 8B
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 8B	**North Reference:**	True
Wellbore:	Job # S15074-02	**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	99.10	132.00	1,894.00	-0.04	0.23	0.22	0.15	0.15	0.00
223.00	0.20	77.20	223.00	1,803.00	-0.03	0.54	0.54	0.08	0.00	-24.07
314.00	0.40	58.20	314.00	1,712.00	0.18	0.96	0.97	0.24	0.22	-20.88
407.00	0.70	27.00	406.99	1,619.01	0.85	1.50	1.55	0.44	0.32	-33.55
493.00	0.80	43.10	492.99	1,533.01	1.76	2.15	2.25	0.27	0.12	18.72
579.00	0.70	39.70	578.98	1,447.02	2.60	2.89	3.05	0.13	-0.12	-3.95
669.00	0.40	68.60	668.97	1,357.03	3.14	3.54	3.72	0.44	-0.33	32.11
751.00	0.40	66.80	750.97	1,275.03	3.36	4.07	4.27	0.02	0.00	-2.20
839.00	0.70	76.40	838.97	1,187.03	3.60	4.87	5.08	0.36	0.34	10.91
927.00	0.70	98.60	926.96	1,099.04	3.65	5.92	6.14	0.31	0.00	25.23
1,013.00	0.20	141.00	1,012.96	1,013.04	3.46	6.54	6.74	0.66	-0.58	49.30
1,100.00	0.20	151.00	1,099.96	926.04	3.20	6.71	6.89	0.04	0.00	11.49
1,189.00	0.90	200.00	1,188.95	837.05	2.41	6.54	6.68	0.88	0.79	55.06
1,277.00	0.70	226.40	1,276.95	749.05	1.39	5.92	5.99	0.47	-0.23	30.00
1,365.00	0.30	108.70	1,364.94	661.06	0.95	5.75	5.79	1.00	-0.45	-133.75
1,450.00	0.40	67.40	1,449.94	576.06	0.99	6.23	6.28	0.31	0.12	-48.59
1,536.00	0.40	91.60	1,535.94	490.06	1.10	6.81	6.86	0.19	0.00	28.14
1,623.00	0.50	52.30	1,622.94	403.06	1.32	7.41	7.48	0.36	0.11	-45.17
1,711.00	0.20	37.80	1,710.94	315.06	1.68	7.81	7.90	0.35	-0.34	-16.48
1,799.00	0.10	40.50	1,798.94	227.06	1.86	7.95	8.05	0.11	-0.11	3.07
1,886.00	0.10	164.60	1,885.94	140.06	1.84	8.02	8.12	0.20	0.00	142.64
1,974.00	0.50	151.40	1,973.93	52.07	1.43	8.23	8.30	0.46	0.45	-15.00
Last MWD Survey										
2,059.00	**0.90**	**147.30**	**2,058.93**	**-32.93**	**0.54**	**8.77**	**8.78**	**0.47**	**0.47**	**-4.82**

Survey Annotations

MD (usft)	TVD (usft)	Local Coordinates +N/-S (usft)	Local Coordinates +E/-W (usft)	Comment
0.00	0.00	0.00	0.00	Tie-in from Surface
2,059.00	2,058.93	0.54	8.77	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, May 01, 2015

State of North Dakota

Subject: **Surveys**

Re: **Oasis**
Kline Federal 5300 31-18 8B
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.	2059'	10995'	03/19/15	03/24/15	MWD	10995'
Mike McCammond	MWD Operator	O.H.	10995'	20331'	04/25/15	04/30/15	MWD	20395'

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

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

Tuesday, March 24, 2015

State of North Dakota
County of McKenzie

Subject: **Survey Certification Letter**

Survey Company: **Ryan Directional Services, Inc.**
Job Number: **8796**
Survey Job Type: **Ryan MWD**
Customer: **Oasis Petroleum**
Well Name: **Kline Federal 5300 31-18 8B**
Rig Name: **Nabors B-22**

Surface: **48 4' 28.160 N / 103 36' 11.380 W**
A.P.I. No: **33-053-06055**
Location: **McKenzie, ND**
RKB Height: **2033'**
Distance to Bit: **62'**

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	2154'	10995'	03/19/15	03/24/15	MWD	11057'

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

Thursday, April 30, 2015

State of North Dakota
County of McKenzie

Subject: **Survey Certification Letter**

Survey Company: **Ryan Directional Services, Inc.**
Job Number: **8832**
Survey Job Type: **Ryan MWD**
Customer: **Oasis Petroleum**
Well Name: **Kline Federal 5300 31-18 8B**
Rig Name: **Nabors B-22**

Surface: **48 4' 28.160 N / 103 36' 11.380 W**
A.P.I. No: **33-053-06055**
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	11052'	20331'	04/25/15	04/30/15	MWD	20395'

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 # 8796

SURVEY REPORT

Customer: Oasis Petroleum
Well Name: Kline Federal 5300 31-18 8B
Rig #: Nabors B-22
API #: 33-053-06055
Calculation Method: Minimum Curvature Calculation

MWD Operator: M McCammond
Directional Drillers: J Gordon / D Thompson
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	**2059**	**0.90**	**147.30**		**2058.93**	**8.77**	**0.54**	**8.77**	**0.47**
1	2154	1.10	148.00	66.00	2153.92	9.66	-0.86	9.66	0.21
2	2247	0.90	152.70	69.00	2246.90	10.46	-2.27	10.46	0.23
3	2340	1.10	117.90	73.00	2339.89	11.59	-3.33	11.59	0.68
4	2434	1.30	97.20	75.00	2433.87	13.44	-3.89	13.44	0.50
5	**2527**	**1.40**	**78.10**	**78.00**	**2526.84**	**15.60**	**-3.79**	**15.60**	**0.49**
6	2621	0.90	66.00	80.00	2620.82	17.40	-3.25	17.40	0.59
7	2714	0.60	16.90	82.00	2713.82	18.21	-2.49	18.21	0.73
8	2714	0.60	16.90	84.00	2713.82	18.21	-2.49	18.21	0.00
9	2807	0.20	352.70	84.00	2806.81	18.33	-1.86	18.33	0.46
10	**2901**	**1.50**	**90.30**	**87.00**	**2900.80**	**19.54**	**-1.70**	**19.54**	**1.64**
11	2994	1.80	102.30	89.00	2993.76	22.18	-2.02	22.18	0.49
12	3087	2.10	102.40	89.00	3086.71	25.27	-2.70	25.27	0.32
13	3181	1.50	83.10	91.00	3180.66	28.18	-2.92	28.18	0.90
14	3274	1.20	82.30	93.00	3273.64	30.35	-2.64	30.35	0.32
15	**3368**	**0.90**	**79.10**	**95.00**	**3367.62**	**32.05**	**-2.37**	**32.05**	**0.33**
16	3461	0.90	71.80	96.00	3460.61	33.46	-2.01	33.46	0.12
17	3554	1.00	75.10	98.00	3553.60	34.94	-1.57	34.94	0.12
18	3648	0.70	55.30	100.00	3647.59	36.21	-1.03	36.21	0.44
19	3741	0.60	47.30	103.00	3740.58	37.03	-0.38	37.03	0.14
20	**3835**	**0.50**	**9.30**	**104.00**	**3834.58**	**37.46**	**0.36**	**37.46**	**0.39**
21	3928	0.30	317.90	105.00	3927.58	37.36	0.94	37.36	0.42
22	4021	0.40	300.10	107.00	4020.57	36.92	1.28	36.92	0.16
23	4115	0.40	315.00	109.00	4114.57	36.40	1.68	36.40	0.11
24	4208	0.20	304.00	111.00	4207.57	36.04	2.00	36.04	0.22
25	**4302**	**0.30**	**332.20**	**113.00**	**4301.57**	**35.79**	**2.31**	**35.79**	**0.17**
26	4395	0.40	328.60	114.00	4394.57	35.50	2.80	35.50	0.11
27	4488	0.80	98.30	114.00	4487.57	35.98	2.99	35.98	1.18
28	4582	0.70	87.00	116.00	4581.56	37.20	2.92	37.20	0.19
29	4675	0.50	70.10	118.00	4674.55	38.15	3.09	38.15	0.28
30	**4769**	**0.80**	**57.40**	**120.00**	**4768.55**	**39.09**	**3.58**	**39.09**	**0.35**
31	4862	0.70	23.10	122.00	4861.54	39.86	4.46	39.86	0.49
32	4955	0.80	23.20	123.00	4954.53	40.34	5.57	40.34	0.11
33	5049	0.10	51.70	123.00	5048.53	40.66	6.23	40.66	0.76
34	5142	0.30	291.30	125.00	5141.53	40.50	6.37	40.50	0.39
35	**5235**	**0.30**	**207.60**	**127.00**	**5234.53**	**40.16**	**6.24**	**40.16**	**0.43**
36	5329	0.70	185.00	129.00	5328.52	39.99	5.45	39.99	0.47
37	5422	0.40	215.00	118.00	5421.52	39.76	4.62	39.76	0.44
38	5516	0.30	250.80	122.00	5515.52	39.34	4.27	39.34	0.25
39	5609	0.30	225.70	127.00	5608.52	38.93	4.02	38.93	0.14
40	**5702**	**0.40**	**332.80**	**129.00**	**5701.51**	**38.61**	**4.14**	**38.61**	**0.61**
41	5796	0.40	34.30	129.00	5795.51	38.64	4.70	38.64	0.44
42	5889	0.40	26.70	134.00	5888.51	38.97	5.26	38.97	0.06
43	5982	0.10	305.20	136.00	5981.51	39.05	5.59	39.05	0.43
44	6076	0.40	212.80	138.00	6075.51	38.81	5.37	38.81	0.44
45	**6169**	**0.70**	**211.60**	**140.00**	**6168.50**	**38.33**	**4.61**	**38.33**	**0.32**
46	6262	0.70	226.70	141.00	6261.50	37.62	3.74	37.62	0.20
47	6356	1.00	188.70	143.00	6355.49	37.08	2.53	37.08	0.66
48	6449	1.80	177.60	147.00	6448.46	37.02	0.27	37.02	0.90
49	6542	1.70	134.20	147.00	6541.42	38.07	-2.15	38.07	1.39
50	**6636**	**0.90**	**115.40**	**149.00**	**6635.40**	**39.74**	**-3.44**	**39.74**	**0.95**
51	6729	1.30	143.10	154.00	6728.38	41.03	-4.60	41.03	0.70
52	6822	0.40	146.90	154.00	6821.37	41.84	-5.71	41.84	0.97
53	6916	0.60	164.10	159.00	6915.36	42.15	-6.46	42.15	0.26
54	7009	0.70	168.60	161.00	7008.36	42.40	-7.49	42.40	0.12
55	**7102**	**0.60**	**157.50**	**165.00**	**7101.35**	**42.70**	**-8.49**	**42.70**	**0.17**
56	7196	0.40	186.90	167.00	7195.35	42.85	-9.27	42.85	0.34
57	7289	0.80	63.70	163.00	7288.35	43.39	-9.31	43.39	1.15
58	7382	1.00	51.50	165.00	7381.33	44.61	-8.51	44.61	0.30
59	7475	1.10	40.00	168.00	7474.32	45.82	-7.33	45.82	0.25
60	**7568**	**1.00**	**46.50**	**170.00**	**7567.30**	**46.98**	**-6.08**	**46.98**	**0.17**

Report #: 1

Date:

RYAN DIRECTIONAL SERVICES, INC.

A NABORS COMPANY

Ryan Job # 8796

SURVEY REPORT

Customer: Oasis Petroleum
Well Name: Kline Federal 5300 31-18 8B
Rig #: Nabors B-22
API #: 33-053-06055
Calculation Method: Minimum Curvature Calculation

MWD Operator: M McCammond
Directional Drillers: J Gordon / D Thompson
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
61	7662	0.80	59.70	172.00	7661.29	48.14	-5.19	48.14	0.31
62	7755	0.90	59.70	172.00	7754.28	49.33	-4.49	49.33	0.11
63	7848	0.80	51.50	174.00	7847.27	50.47	-3.72	50.47	0.17
64	7942	0.80	25.30	174.00	7941.26	51.26	-2.72	51.26	0.39
65	**8035**	**0.70**	**8.80**	**176.00**	**8034.25**	**51.63**	**-1.57**	**51.63**	**0.25**
66	8128	0.70	0.30	177.00	8127.25	51.72	-0.44	51.72	0.11
67	8222	0.90	341.40	179.00	8221.24	51.49	0.83	51.49	0.35
68	8315	0.80	340.40	181.00	8314.23	51.03	2.14	51.03	0.11
69	8409	0.80	355.70	179.00	8408.22	50.77	3.41	50.77	0.23
70	**8502**	**0.50**	**346.20**	**179.00**	**8501.21**	**50.62**	**4.45**	**50.62**	**0.34**
71	8595	0.40	326.40	181.00	8594.21	50.34	5.12	50.34	0.20
72	8689	0.40	334.90	183.00	8688.21	50.02	5.69	50.02	0.06
73	8782	0.50	342.90	185.00	8781.20	49.77	6.37	49.77	0.13
74	8875	0.60	327.60	185.00	8874.20	49.39	7.17	49.39	0.19
75	**8969**	**0.60**	**314.90**	**185.00**	**8968.20**	**48.77**	**7.93**	**48.77**	**0.14**
76	9062	0.50	333.60	190.00	9061.19	48.25	8.64	48.25	0.22
77	9155	0.60	327.60	188.00	9154.19	47.81	9.41	47.81	0.12
78	9248	0.50	312.10	186.00	9247.18	47.24	10.10	47.24	0.19
79	9342	0.60	323.60	188.00	9341.18	46.65	10.77	46.65	0.16
80	**9435**	**0.50**	**316.30**	**190.00**	**9434.17**	**46.08**	**11.45**	**46.08**	**0.13**
81	9528	0.50	322.00	192.00	9527.17	45.55	12.07	45.55	0.05
82	9622	0.70	241.00	190.00	9621.17	44.79	12.11	44.79	0.84
83	9715	0.70	252.20	195.00	9714.16	43.76	11.66	43.76	0.15
84	9808	0.50	253.90	194.00	9807.15	42.83	11.38	42.83	0.22
85	**9901**	**0.40**	**241.70**	**192.00**	**9900.15**	**42.15**	**11.11**	**42.15**	**0.15**
86	9972	0.40	265.50	195.00	9971.15	41.68	10.97	41.68	0.23
87	10030	0.50	261.20	176.00	10029.15	41.23	10.92	41.23	0.18
88	10124	0.40	290.10	181.00	10123.15	40.52	10.97	40.52	0.26
89	10155	1.20	100.20	185.00	10154.14	40.74	10.95	40.74	5.15
90	**10186**	**5.40**	**112.10**	**185.00**	**10185.09**	**42.41**	**10.34**	**42.41**	**13.65**
91	10217	8.60	112.60	185.00	10215.85	45.90	8.90	45.90	10.32
92	10248	12.60	106.90	186.00	10246.32	51.28	7.03	51.28	13.32
93	10279	15.70	104.80	186.00	10276.37	58.57	4.97	58.57	10.13
94	10310	18.20	103.30	186.00	10306.02	67.34	2.79	67.34	8.19
95	**10342**	**20.90**	**103.90**	**188.00**	**10336.18**	**77.74**	**0.26**	**77.74**	**8.46**
96	10373	24.20	106.60	188.00	10364.80	89.20	-2.88	89.20	11.15
97	10404	26.90	104.80	188.00	10392.77	102.08	-6.49	102.08	9.06
98	10435	30.30	102.90	190.00	10419.98	116.48	-10.03	116.48	11.35
99	10466	34.20	103.20	190.00	10446.20	132.59	-13.76	132.59	12.59
100	**10497**	**37.20**	**102.90**	**190.00**	**10471.37**	**150.22**	**-17.84**	**150.22**	**9.69**
101	10528	40.70	102.90	192.00	10495.47	169.21	-22.19	169.21	11.29
102	10560	45.00	102.60	192.00	10518.93	190.43	-26.99	190.43	13.45
103	10591	45.10	101.80	192.00	10540.83	211.87	-31.63	211.87	1.85
104	10622	47.90	102.10	192.00	10562.16	233.87	-36.29	233.87	9.06
105	**10653**	**50.30**	**104.20**	**194.00**	**10582.46**	**256.68**	**-41.62**	**256.68**	**9.28**
106	10684	54.10	103.80	194.00	10601.46	280.44	-47.55	280.44	12.30
107	10715	59.20	103.60	195.00	10618.50	305.60	-53.68	305.60	16.46
108	10746	63.10	103.70	195.00	10633.45	331.98	-60.08	331.98	12.58
109	10778	65.20	102.80	197.00	10647.40	360.01	-66.68	360.01	7.03
110	**10809**	**65.30**	**102.50**	**197.00**	**10660.38**	**387.47**	**-72.85**	**387.47**	**0.94**
111	10840	66.80	102.70	197.00	10672.96	415.12	-79.03	415.12	4.87
112	10871	71.40	102.80	195.00	10684.02	443.36	-85.42	443.36	14.84
113	10902	77.20	102.70	197.00	10692.41	472.46	-92.00	472.46	18.71
114	10933	82.90	102.70	199.00	10697.76	502.23	-98.71	502.23	18.39
115	**10964**	**87.30**	**103.00**	**199.00**	**10700.41**	**532.34**	**-105.58**	**532.34**	**14.23**
116	10995	88.30	102.50	197.00	10701.60	562.55	-112.42	562.55	3.61
117	11052	89.90	100.80	221.00	10702.49	618.36	-123.92	618.36	4.10
118	11069	90.60	102.90	222.00	10702.42	635.00	-127.41	635.00	13.02
119	11101	90.30	102.80	222.00	10702.17	666.20	-134.53	666.20	0.99
120	**11131**	**89.90**	**102.40**	**221.00**	**10702.11**	**695.48**	**-141.07**	**695.48**	**1.89**

Report #: 1

Date:

RYAN DIRECTIONAL SERVICES, INC.

A NABORS COMPANY

Ryan Job # 8796

SURVEY REPORT

Customer: Oasis Petroleum

Well Name: Kline Federal 5300 31-18 8B

Rig #: Nabors B-22

API #: 33-053-06055

Calculation Method: Minimum Curvature Calculation

MWD Operator: M McCammond

Directional Drillers: J Gordon / D Thompson

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
121	11161	89.80	102.40	221.00	10702.19	724.78	-147.52	724.78	0.33
122	11192	89.60	101.80	221.00	10702.36	755.09	-154.01	755.09	2.04
123	11223	87.50	101.20	221.00	10703.14	785.45	-160.19	785.45	7.05
124	11255	87.51	101.20	221.00	10704.53	816.81	-166.40	816.81	0.03
125	**11285**	**87.50**	**101.30**	**221.00**	**10705.84**	**846.21**	**-172.25**	**846.21**	**0.33**
126	11315	88.40	99.00	221.00	10706.91	875.72	-177.53	875.72	8.23
127	11346	88.80	98.20	221.00	10707.67	906.36	-182.17	906.36	2.88
128	11376	88.60	98.10	221.00	10708.35	936.05	-186.42	936.05	0.75
129	11407	88.20	95.60	221.00	10709.22	966.81	-190.11	966.81	8.16
130	**11437**	**88.40**	**94.90**	**222.00**	**10710.11**	**996.67**	**-192.86**	**996.67**	**2.43**
131	11469	88.70	94.40	222.00	10710.92	1028.56	-195.45	1028.56	1.82
132	11500	90.20	93.60	222.00	10711.21	1059.48	-197.61	1059.48	5.48
133	11530	90.40	93.60	222.00	10711.06	1089.42	-199.50	1089.42	0.67
134	11560	90.50	93.40	222.00	10710.82	1119.36	-201.33	1119.36	0.75
135	**11591**	**90.90**	**91.20**	**222.00**	**10710.44**	**1150.34**	**-202.57**	**1150.34**	**7.21**
136	11621	91.10	90.30	224.00	10709.92	1180.33	-202.96	1180.33	3.07
137	11652	90.90	89.50	224.00	10709.38	1211.32	-202.91	1211.32	2.66
138	11684	89.90	87.90	224.00	10709.15	1243.31	-202.18	1243.31	5.90
139	11779	89.50	87.80	228.00	10709.65	1338.24	-198.62	1338.24	0.43
140	**11872**	**89.40**	**87.30**	**230.00**	**10710.54**	**1431.15**	**-194.65**	**1431.15**	**0.55**
141	11964	90.00	87.30	231.00	10711.03	1523.05	-190.31	1523.05	0.65
142	12056	90.40	86.80	233.00	10710.70	1614.93	-185.58	1614.93	0.70
143	12151	88.50	87.40	233.00	10711.62	1709.80	-180.77	1709.80	2.10
144	12245	88.50	88.70	233.00	10714.08	1803.71	-177.57	1803.71	1.38
145	**12340**	**89.50**	**89.80**	**235.00**	**10715.73**	**1898.68**	**-176.33**	**1898.68**	**1.56**
146	12435	89.60	90.60	235.00	10716.48	1993.68	-176.66	1993.68	0.85
147	12530	90.70	91.20	237.00	10716.23	2088.66	-178.15	2088.66	1.32
148	12625	90.80	90.70	239.00	10714.99	2183.64	-179.73	2183.64	0.54
149	12720	90.30	90.20	240.00	10714.08	2278.63	-180.48	2278.63	0.74
150	**12814**	**90.50**	**89.90**	**242.00**	**10713.42**	**2372.63**	**-180.56**	**2372.63**	**0.38**
151	12909	90.90	90.00	242.00	10712.26	2467.63	-180.47	2467.63	0.43
152	13004	89.40	89.30	242.00	10712.01	2562.62	-179.89	2562.62	1.74
153	13099	89.30	89.20	244.00	10713.09	2657.61	-178.65	2657.61	0.15
154	13194	89.80	88.80	244.00	10713.84	2752.59	-176.99	2752.59	0.67
155	**13289**	**89.00**	**89.80**	**244.00**	**10714.83**	**2847.57**	**-175.83**	**2847.57**	**1.35**
156	13383	89.50	90.10	246.00	10716.06	2941.56	-175.75	2941.56	0.62
157	13478	90.10	89.70	246.00	10716.39	3036.56	-175.58	3036.56	0.76
158	13573	89.80	91.30	244.00	10716.47	3131.56	-176.41	3131.56	1.71
159	13668	88.40	90.40	246.00	10717.97	3226.53	-177.82	3226.53	1.75
160	**13763**	**88.50**	**90.00**	**248.00**	**10720.54**	**3321.50**	**-178.15**	**3321.50**	**0.43**
161	13857	89.20	90.40	249.00	10722.42	3415.48	-178.48	3415.48	0.86
162	13952	89.90	90.20	249.00	10723.17	3510.47	-178.98	3510.47	0.77
163	14047	89.50	90.60	249.00	10723.67	3605.47	-179.64	3605.47	0.60
164	14142	90.10	90.60	249.00	10724.00	3700.46	-180.64	3700.46	0.63
165	**14237**	**89.00**	**91.30**	**248.00**	**10724.74**	**3795.44**	**-182.21**	**3795.44**	**1.37**
166	14332	90.00	91.10	251.00	10725.57	3890.42	-184.20	3890.42	1.07
167	14427	90.10	90.60	251.00	10725.49	3985.41	-185.61	3985.41	0.54
168	14521	89.10	90.40	251.00	10726.15	4079.40	-186.43	4079.40	1.08
169	14616	90.40	90.60	253.00	10726.56	4174.39	-187.26	4174.39	1.38
170	**14711**	**91.40**	**90.20**	**253.00**	**10725.07**	**4269.38**	**-187.92**	**4269.38**	**1.13**
171	14806	89.30	89.90	251.00	10724.49	4364.37	-188.01	4364.37	2.23
172	14901	89.50	89.80	253.00	10725.48	4459.36	-187.76	4459.36	0.24
173	14996	88.20	89.60	253.00	10727.39	4554.34	-187.26	4554.34	1.38
174	15090	88.50	89.70	255.00	10730.10	4648.30	-186.69	4648.30	0.34
175	**15185**	**88.40**	**89.40**	**255.00**	**10732.67**	**4743.26**	**-185.94**	**4743.26**	**0.33**
176	15280	89.90	89.80	255.00	10734.08	4838.25	-185.28	4838.25	1.63
177	15375	90.50	88.70	257.00	10733.74	4933.24	-184.03	4933.24	1.32
178	15470	90.20	88.00	258.00	10733.16	5028.19	-181.30	5028.19	0.80
179	15564	90.10	89.50	255.00	10732.92	5122.17	-179.25	5122.17	1.60
180	**15659**	**90.60**	**91.60**	**255.00**	**10732.34**	**5217.16**	**-180.16**	**5217.16**	**2.27**

Report #: 1

Date:

RYAN DIRECTIONAL SERVICES, INC.

A NABORS COMPANY

Ryan Job # 8796

SURVEY REPORT

Customer: Oasis Petroleum

Well Name: Kline Federal 5300 31-18 8B

Rig #: Nabors B-22

API #: 33-053-06055

Calculation Method: Minimum Curvature Calculation

MWD Operator: M McCammond

Directional Drillers: J Gordon / D Thompson

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
181	15754	88.60	91.30	255.00	10733.00	5312.12	-182.56	5312.12	2.13
182	15849	90.10	92.20	257.00	10734.08	5407.07	-185.47	5407.07	1.84
183	15943	91.30	92.30	255.00	10732.93	5500.98	-189.16	5500.98	1.28
184	16038	90.60	90.00	257.00	10731.35	5595.95	-191.06	5595.95	2.53
185	**16133**	**89.30**	**90.40**	**258.00**	**10731.44**	**5690.94**	**-191.39**	**5690.94**	**1.43**
186	16228	89.40	90.40	260.00	10732.52	5785.93	-192.06	5785.93	0.11
187	16323	90.20	89.70	260.00	10732.85	5880.93	-192.14	5880.93	1.12
188	16417	88.00	89.20	260.00	10734.32	5974.91	-191.24	5974.91	2.40
189	16512	87.90	88.60	260.00	10737.72	6069.83	-189.41	6069.83	0.64
190	**16607**	**87.80**	**88.60**	**260.00**	**10741.29**	**6164.74**	**-187.09**	**6164.74**	**0.11**
191	16702	89.50	89.20	260.00	10743.52	6259.69	-185.27	6259.69	1.90
192	16796	90.20	88.60	262.00	10743.77	6353.67	-183.47	6353.67	0.98
193	16891	90.70	89.20	262.00	10743.02	6448.65	-181.64	6448.65	0.82
194	16986	89.80	89.20	262.00	10742.61	6543.64	-180.32	6543.64	0.95
195	**17081**	**90.40**	**90.20**	**260.00**	**10742.44**	**6638.63**	**-179.82**	**6638.63**	**1.23**
196	17176	90.70	89.80	262.00	10741.53	6733.63	-179.82	6733.63	0.53
197	17271	91.20	90.50	260.00	10739.96	6828.62	-180.07	6828.62	0.91
198	17365	89.90	91.30	262.00	10739.05	6922.60	-181.54	6922.60	1.62
199	17460	90.50	90.90	262.00	10738.72	7017.58	-183.37	7017.58	0.76
200	**17555**	**89.50**	**93.10**	**262.00**	**10738.72**	**7112.51**	**-186.68**	**7112.51**	**2.54**
201	17650	89.70	93.40	264.00	10739.39	7207.36	-192.07	7207.36	0.38
202	17745	90.50	92.80	264.00	10739.22	7302.22	-197.21	7302.22	1.05
203	17839	89.60	91.00	264.00	10739.14	7396.16	-200.32	7396.16	2.14
204	17934	89.90	89.90	264.00	10739.55	7491.16	-201.07	7491.16	1.20
205	**18029**	**90.50**	**89.60**	**264.00**	**10739.22**	**7586.15**	**-200.65**	**7586.15**	**0.71**
206	18124	91.00	90.20	266.00	10737.98	7681.14	-200.49	7681.14	0.82
207	18219	91.30	89.40	266.00	10736.07	7776.12	-200.16	7776.12	0.90
208	18313	90.00	89.60	264.00	10735.00	7870.11	-199.34	7870.11	1.40
209	18408	89.90	90.40	264.00	10735.09	7965.11	-199.34	7965.11	0.85
210	**18502**	**90.80**	**89.50**	**266.00**	**10734.51**	**8059.11**	**-199.26**	**8059.11**	**1.35**
211	18597	90.10	88.20	266.00	10733.77	8154.08	-197.35	8154.08	1.55
212	18692	90.20	86.40	266.00	10733.52	8248.97	-192.87	8248.97	1.90
213	18787	89.60	86.60	264.00	10733.68	8343.80	-187.07	8343.80	0.67
214	18882	89.60	86.70	264.00	10734.35	8438.63	-181.52	8438.63	0.11
215	**18976**	**89.80**	**86.30**	**266.00**	**10734.84**	**8532.45**	**-175.78**	**8532.45**	**0.48**
216	19071	90.40	89.20	264.00	10734.67	8627.37	-172.06	8627.37	3.12
217	19166	90.50	88.80	266.00	10733.93	8722.35	-170.40	8722.35	0.43
218	19261	89.90	89.70	264.00	10733.60	8817.34	-169.15	8817.34	1.14
219	19356	89.70	90.30	266.00	10733.93	8912.34	-169.15	8912.34	0.67
220	**19450**	**90.00**	**89.90**	**266.00**	**10734.17**	**9006.34**	**-169.32**	**9006.34**	**0.53**
221	19545	90.00	89.20	266.00	10734.17	9101.34	-168.57	9101.34	0.74
222	19640	90.60	91.30	266.00	10733.68	9196.33	-168.99	9196.33	2.30
223	19735	91.40	90.80	266.00	10732.02	9291.30	-170.73	9291.30	0.99
224	19829	90.00	90.60	264.00	10730.87	9385.28	-171.88	9385.28	1.50
225	**19924**	**90.30**	**91.00**	**266.00**	**10730.62**	**9480.27**	**-173.20**	**9480.27**	**0.53**
226	20019	90.60	89.90	267.00	10729.87	9575.26	-173.95	9575.26	1.20
227	20114	89.30	88.50	266.00	10729.96	9670.25	-172.62	9670.25	2.01
228	20209	89.30	88.10	266.00	10731.12	9765.20	-169.80	9765.20	0.42
229	20304	89.40	89.00	266.00	10732.20	9860.16	-167.40	9860.16	0.95
230	**20331**	**89.70**	**88.70**	**266.00**	**10732.41**	**9887.16**	**-166.86**	**9887.16**	**1.57**
Projection	20395	89.70	88.70	PTB	10732.74	9951.14	-165.41	9951.14	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.
28754

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

☑ Notice of Intent	Approximate Start Date **May 15, 2015**	☐ 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	**Physical Address**

Well Name and Number					
Kline Federal 5300 31-18 8B					
Footages	Qtr-Qtr	Section	Township	Range	
2523 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 **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 6, 2015**	
Email Address **vsiemieniewski@oasispetroleum.com**		

FOR STATE USE ONLY

☒ Received	☐ Approved
Date 3/16/2015	
By Matthew Marsana	
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. **28754**

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 ☐ Spill Report
☐ Redrilling or Repair ☐ Shooting
☐ 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 8T					
Footages	Qtr-Qtr	Section	Township	Range	
2523 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 8B (previously 8T)

Formation Change: Bakken (previously three forks first bench)

251' NDIC Calc

BHL change: 2335' FSL & 250' FEL Sec 18 T153N R100W
(previously: 2250' FSL & 200' FEL)

Surface casing design:
Contingency Casing of 9 5/8" set at 6,437' (previously set at 6,101')
Intermediate Casing of 7" set at 10,969' (previously set at 11,036')
Production liner of 4 1/2" set from 10,171' to 20,520' (previously set from 10,238' to 20,656')

See attached supporting documents.

CC 25.00 2-20-15 KB CC 25.00

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 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 8B"
2523 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 2/05/15 AND THE ORIGINAL DOCUMENTS ARE STORED AT THE OFFICES OF INTERSTATE ENGINEERING, INC.

0 1000
1" = 1000'

✚ I – MONUMENT – RECOVERED
✚ I – 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

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Revision No.	Date	By	Description
REV 1	1/27/15	DHI	CHANGED WELL NAMES & BHL
REV 2	2/05/15	JLB	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.: 514-09-105.02
Checked By: D.D.K. Date: APRIL 2014

Interstate Engineering, Inc.
P.O. Box 648
425 East Broadway Avenue
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
Professionally yours, people you trust

1/8
SHEET NO.

DRILLING PLAN

OPERATOR	Oasis Petroleum	**COUNTY/STATE**	McKenzie Co., ND
WELL NAME	Kline Federal 5300 31-18 8B	**RIG**	0
WELL TYPE	Horizontal Middle Bakken		
LOCATION	NWSW 18-153N-100W Surface Location (survey plat): 2523' fsl 238' fwl		
EST. T.D.	20,462'	**GROUND ELEV:**	2008 Finished Pad Elev. **Sub Height:** 25
	TOTAL LATERA 9,493'	**KB ELEV:**	2033

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

MARKER		DEPTH (Surf Loc)	DATUM (Surf Loc)
Pierre	NDIC MAP	1,923	110
Greenhorn		4,597	(2,564)
Mowry		5,008	(2,975)
Dakota		5,422	(3,389)
Rierdon		6,437	(4,404)
Dunham Salt		6,765	(4,732)
Dunham Salt Base		6,880	(4,847)
Spearfish		6,975	(4,942)
Pine Salt		7,234	(5,201)
Pine Salt Base		7,269	(5,236)
Opeche Salt		7,325	(5,292)
Opeche Salt Base		7,354	(5,321)
Broom Creek (Top of Minnelusa Gp.)		7,556	(5,523)
Amsden		7,635	(5,602)
Tyler		7,804	(5,771)
Otter (Base of Minnelusa Gp.)		7,998	(5,965)
Kibbey Lime		8,341	(6,308)
Charles Salt		8,493	(6,460)
UB		9,110	(7,077)
Base Last Salt		9,181	(7,148)
Ratcliffe		9,244	(7,211)
Mission Canyon		9,387	(7,354)
Lodgepole		9,955	(7,922)
Lodgepole Fracture Zone		10,142	(8,109)
False Bakken		10,659	(8,626)
Upper Bakken		10,668	(8,635)
Middle Bakken		10,684	(8,651)
Middle Bakken Sand Target		10,693	(8,660)
Base Middle Bakken Sand Target		10,703	(8,670)
Lower Bakken		10,716	(8,683)
Three Forks		10,746	(8,713)

Dip Rate: -0.2

Max. Anticipated BHP: 4544

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: 8,293'
~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' -	10,969'	Invert	9.5-10.4	40-50	30+HtHp	Circ Mud Tanks
Lateral:	10,969' -	20,462'	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"	36#	12-1/4"	6,437'		To Surface	12	Below Dakota
Intermediate:	7"	32#	8-3/4"	10,969'		4922	24	500' above Dakota
Production Liner:	4.5"	13.5#	6"	20,462'	TOL @ 10,171			50' above KOP

PROBABLE PLUGS, IF REQ'D:

OTHER:

	MD	TVD	FNL/FSL	FEL/FWL	S-T-R	AZI
Surface:	2,023	2,023	2523' FSL	238' FWL	SEC 18-T153N-R100W	
KOP:	10,221'	10,221	2523' FSL	288' FWL	SEC 18-T153N-R100W	
EOC:	10,969'	10,698'	2413' FSL	751' FWL	SEC 18-T153N-R100W	103.40
Casing Point:	10,969'	10,698'	2413' FSL	751' FWL	SEC 18-T153N-R100W	103.40
Middle Bakken Lateral TD:	20,462'	10,731'	2335' FSL	250' FEL	SEC 17-T153N-R100W	90.00

Build Rate: 12 deg /100'

Comments:

Request a Sundry for an Open Hole Log Waiver

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

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 5/12/2014 **Engineering:** hlbader rpm 7/17/14 TR 1-29-15

Oasis Petroleum
Well Summary
Kline Federal 5300 31-18 8B
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 8B
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' - 6437'	36	HCL-80	LTC	8.835"	8.75"	5450	7270	9090

Interval	Description	Collapse	Burst	Tension
		(psi) / a	(psi) / b	(1000 lbs) / c
0' - 6437'	9-5/8", 36#, J-55, LTC, 8rd	2020 / 2.16	3520 / 1.29	453 / 1.53

API Rating & Safety Factor

a) Collapse based on full casing evacuation with 10.4 ppg fluid on backside (6437' 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 6437' TVD plus 100k# overpull. (Buoyed weight equals 195k 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: **564 sks** (291 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: **615 sks** (127 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 8B
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' - 10969'	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' - 10969'	10969'	7", 32#, HCP-110, LTC, 8rd	11820 / 2.12*	12460 / 1.28	897 / 2.25
6765' - 9181'	2416'	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 10698' TVD.

c) Based on string weight in 10 ppg fluid, (297k 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: **177 sks** (82 bbls), 11.8 ppg, 2.55 cu. ft./sk Econocem Cement with .3% Fe-2 and .25 lb/sk Lost Circulation Additive

Tail Slurry: **575 sks** (168 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 8B
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"	10171' - 20462'	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
10171' - 20462'	10291	4-1/2", 13.5 lb, P-110, BTC	10670 / 2.01	12410 / 1.28	443 / 2.02

API Rating & Safety Factor

a) Based on full casing evacuation with 9.5 ppg fluid on backside @ 10731' TVD.

b) Burst pressure based on 9000 psi treating pressure with 10.2 ppg internal fluid gradient and 9 ppg external fluid gradient @ 10731' TVD.

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

Project: Indian Hills
Site: 153N-100W-17/18
Well: Kline Federal 5300 31-18 8B
Wellbore: Kline Federal 5300 31-18 8B
Design: Design #2

OASIS PETROLEUM

WELL DETAILS: Kline Federal 5300 31-18 8B

Ground Level: 2008.0

Northing	Easting	Latitude	Longitude
407221.72	1210091.04	48° 4' 28.160 N	103° 36' 11.380 W

T M

Azimuths to True North
Magnetic North: 8.40°

Magnetic Field
Strength: 56363.3snT
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
6437.0	6437.2	9 5/8"	9.625
10698.0	10969.0	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	
2150.0	0.00	0.00	2150.0	0.0	0.0	0.00	
2160.0	0.50	90.00	2160.0	0.0	0.0	5.00	
7879.7	0.50	90.00	7879.4	0.0	50.0	0.00	
7889.7	0.00	0.00	7889.4	0.0	50.0	5.00	
10220.7	0.00	0.00	10220.5	0.0	50.0	0.00	
10969.0	89.80	103.40	10698.0	-110.3	512.8	12.00	
11639.1	89.80	90.00	10700.3	-188.3	1176.8	2.00	
20462.4	89.80	90.00	10731.0	-188.0	10000.0	0.00	KLINE FEDERAL 5300 31-18 8B PBHL

Oasis

Indian Hills
153N-100W-17/18
Kline Federal 5300 31-18 8B
Kline Federal 5300 31-18 8B
Kline Federal 5300 31-18 8B

Plan: Design #2

Standard Planning Report

17 February, 2015

Database:	OpenWellsCompass - EDM Prod	**Local Co-ordinate Reference:**	Well Kline Federal 5300 31-18 8B
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 8B	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Kline Federal 5300 31-18 8B		
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 8B

Well Position	**+N/-S**	32.4 usft	**Northing:**	407,221.72 usft	**Latitude:**	48° 4' 28.160 N
	+E/-W	0.0 usft	**Easting:**	1,210,091.03 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 8B

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	
2,150.0	0.00	0.00	2,150.0	0.0	0.0	0.00	0.00	0.00	0.00	
2,160.0	0.50	90.00	2,160.0	0.0	0.0	5.00	5.00	0.00	90.00	
7,879.7	0.50	90.00	7,879.4	0.0	50.0	0.00	0.00	0.00	0.00	
7,889.7	0.00	0.00	7,889.4	0.0	50.0	5.00	-5.00	0.00	180.00	
10,220.7	0.00	0.00	10,220.5	0.0	50.0	0.00	0.00	0.00	0.00	
10,969.0	89.80	103.40	10,698.0	-110.3	512.8	12.00	12.00	0.00	103.40	
11,639.1	89.80	90.00	10,700.3	-188.3	1,176.8	2.00	0.00	-2.00	-90.02	
20,462.4	89.80	90.00	10,731.0	-188.0	10,000.0	0.00	0.00	0.00	0.00	5300 31-18 8B PBHL

Database:	OpenWellsCompass - EDM Prod	**Local Co-ordinate Reference:**	Well Kline Federal 5300 31-18 8B
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 8B	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Kline Federal 5300 31-18 8B		
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)
2,150.0	0.00	0.00	2,150.0	0.0	0.0	0.0	0.00	0.00	0.00
Start Build 5.00									
2,160.0	0.50	90.00	2,160.0	0.0	0.0	0.0	5.00	5.00	0.00
Start 5719.7 hold at 2160.0 MD									
2,200.0	0.50	90.00	2,200.0	0.0	0.4	0.4	0.00	0.00	0.00
2,300.0	0.50	90.00	2,300.0	0.0	1.3	1.3	0.00	0.00	0.00
2,400.0	0.50	90.00	2,400.0	0.0	2.1	2.1	0.00	0.00	0.00
2,500.0	0.50	90.00	2,500.0	0.0	3.0	3.0	0.00	0.00	0.00
2,600.0	0.50	90.00	2,600.0	0.0	3.9	3.9	0.00	0.00	0.00
2,700.0	0.50	90.00	2,700.0	0.0	4.8	4.8	0.00	0.00	0.00
2,800.0	0.50	90.00	2,800.0	0.0	5.6	5.6	0.00	0.00	0.00
2,900.0	0.50	90.00	2,900.0	0.0	6.5	6.5	0.00	0.00	0.00
3,000.0	0.50	90.00	3,000.0	0.0	7.4	7.4	0.00	0.00	0.00
3,100.0	0.50	90.00	3,100.0	0.0	8.2	8.2	0.00	0.00	0.00
3,200.0	0.50	90.00	3,200.0	0.0	9.1	9.1	0.00	0.00	0.00
3,300.0	0.50	90.00	3,300.0	0.0	10.0	10.0	0.00	0.00	0.00
3,400.0	0.50	90.00	3,400.0	0.0	10.9	10.9	0.00	0.00	0.00
3,500.0	0.50	90.00	3,499.9	0.0	11.7	11.7	0.00	0.00	0.00
3,600.0	0.50	90.00	3,599.9	0.0	12.6	12.6	0.00	0.00	0.00
3,700.0	0.50	90.00	3,699.9	0.0	13.5	13.5	0.00	0.00	0.00
3,800.0	0.50	90.00	3,799.9	0.0	14.4	14.4	0.00	0.00	0.00
3,900.0	0.50	90.00	3,899.9	0.0	15.2	15.2	0.00	0.00	0.00
4,000.0	0.50	90.00	3,999.9	0.0	16.1	16.1	0.00	0.00	0.00
4,100.0	0.50	90.00	4,099.9	0.0	17.0	17.0	0.00	0.00	0.00
4,200.0	0.50	90.00	4,199.9	0.0	17.8	17.8	0.00	0.00	0.00
4,300.0	0.50	90.00	4,299.9	0.0	18.7	18.7	0.00	0.00	0.00
4,400.0	0.50	90.00	4,399.9	0.0	19.6	19.6	0.00	0.00	0.00
4,500.0	0.50	90.00	4,499.9	0.0	20.5	20.5	0.00	0.00	0.00
4,600.0	0.50	90.00	4,599.9	0.0	21.3	21.3	0.00	0.00	0.00
4,700.0	0.50	90.00	4,699.9	0.0	22.2	22.2	0.00	0.00	0.00
4,800.0	0.50	90.00	4,799.9	0.0	23.1	23.1	0.00	0.00	0.00
4,900.0	0.50	90.00	4,899.9	0.0	24.0	24.0	0.00	0.00	0.00
5,000.0	0.50	90.00	4,999.9	0.0	24.8	24.8	0.00	0.00	0.00
5,100.0	0.50	90.00	5,099.9	0.0	25.7	25.7	0.00	0.00	0.00
5,200.0	0.50	90.00	5,199.9	0.0	26.6	26.6	0.00	0.00	0.00
5,300.0	0.50	90.00	5,299.9	0.0	27.4	27.4	0.00	0.00	0.00
5,400.0	0.50	90.00	5,399.9	0.0	26.3	28.3	0.00	0.00	0.00
5,500.0	0.50	90.00	5,499.9	0.0	29.2	29.2	0.00	0.00	0.00
5,600.0	0.50	90.00	5,599.9	0.0	30.1	30.1	0.00	0.00	0.00
5,700.0	0.50	90.00	5,699.9	0.0	30.9	30.9	0.00	0.00	0.00
5,800.0	0.50	90.00	5,799.9	0.0	31.8	31.8	0.00	0.00	0.00
5,900.0	0.50	90.00	5,899.9	0.0	32.7	32.7	0.00	0.00	0.00
6,000.0	0.50	90.00	5,999.9	0.0	33.6	33.6	0.00	0.00	0.00
6,100.0	0.50	90.00	6,099.8	0.0	34.4	34.4	0.00	0.00	0.00
6,200.0	0.50	90.00	6,199.8	0.0	35.3	35.3	0.00	0.00	0.00
6,300.0	0.50	90.00	6,299.8	0.0	36.2	36.2	0.00	0.00	0.00
6,400.0	0.50	90.00	6,399.8	0.0	37.0	37.0	0.00	0.00	0.00
6,437.2	0.50	90.00	6,437.0	0.0	37.4	37.4	0.00	0.00	0.00
9 5/8"									
6,500.0	0.50	90.00	6,499.8	0.0	37.9	37.9	0.00	0.00	0.00
6,600.0	0.50	90.00	6,599.8	0.0	38.8	38.8	0.00	0.00	0.00
6,700.0	0.50	90.00	6,699.8	0.0	39.7	39.7	0.00	0.00	0.00
6,800.0	0.50	90.00	6,799.8	0.0	40.5	40.5	0.00	0.00	0.00
6,900.0	0.50	90.00	6,899.8	0.0	41.4	41.4	0.00	0.00	0.00
7,000.0	0.50	90.00	6,999.8	0.0	42.3	42.3	0.00	0.00	0.00

Database:	OpenWellsCompass - EDM Prod	**Local Co-ordinate Reference:**	Well Kline Federal 5300 31-18 8B
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 8B	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Kline Federal 5300 31-18 8B		
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)
7,100.0	0.50	90.00	7,099.8	0.0	43.2	43.2	0.00	0.00	0.00
7,200.0	0.50	90.00	7,199.8	0.0	44.0	44.0	0.00	0.00	0.00
7,300.0	0.50	90.00	7,299.8	0.0	44.9	44.9	0.00	0.00	0.00
7,400.0	0.50	90.00	7,399.8	0.0	45.8	45.8	0.00	0.00	0.00
7,500.0	0.50	90.00	7,499.8	0.0	46.6	46.6	0.00	0.00	0.00
7,600.0	0.50	90.00	7,599.8	0.0	47.5	47.5	0.00	0.00	0.00
7,700.0	0.50	90.00	7,699.8	0.0	48.4	48.4	0.00	0.00	0.00
7,800.0	0.50	90.00	7,799.8	0.0	49.3	49.3	0.00	0.00	0.00
7,879.7	0.50	90.00	7,879.4	0.0	50.0	50.0	0.00	0.00	0.00
Start Drop -5.00									
7,889.7	0.00	0.00	7,889.4	0.0	50.0	50.0	5.00	-5.00	0.00
Start 2331.1 hold at 7889.7 MD									
10,220.7	0.00	0.00	10,220.5	0.0	50.0	50.0	0.00	0.00	0.00
Start Build 12.00									
10,300.0	9.51	103.40	10,299.4	-1.5	56.4	56.4	12.00	12.00	0.00
10,400.0	21.51	103.40	10,395.6	-7.7	82.4	82.4	12.00	12.00	0.00
10,500.0	33.51	103.40	10,484.1	-18.4	127.2	127.2	12.00	12.00	0.00
10,600.0	45.51	103.40	10,561.1	-33.1	189.0	189.0	12.00	12.00	0.00
10,700.0	57.51	103.40	10,623.3	-51.2	265.0	265.0	12.00	12.00	0.00
10,800.0	69.51	103.40	10,667.8	-71.9	351.9	351.9	12.00	12.00	0.00
10,900.0	81.51	103.40	10,692.7	-94.3	445.9	445.9	12.00	12.00	0.00
10,969.0	89.79	103.40	10,698.0	-110.3	512.8	512.8	12.00	12.00	0.00
Start DLS 2.00 TFO -90.02 - 7"									
11,000.0	89.80	102.78	10,698.1	-117.3	543.0	543.0	2.00	0.02	-2.00
11,100.0	89.80	100.78	10,698.4	-137.7	640.9	640.9	2.00	0.00	-2.00
11,200.0	89.80	98.78	10,698.8	-154.7	739.4	739.4	2.00	0.00	-2.00
11,300.0	89.80	96.78	10,699.1	-168.2	838.5	838.5	2.00	0.00	-2.00
11,400.0	89.80	94.78	10,699.5	-178.3	938.0	938.0	2.00	0.00	-2.00
11,500.0	89.80	92.78	10,699.8	-184.9	1,037.8	1,037.8	2.00	0.00	-2.00
11,600.0	89.80	90.78	10,700.2	-188.0	1,137.7	1,137.7	2.00	0.00	-2.00
11,639.1	89.80	90.00	10,700.3	-188.3	1,176.8	1,176.8	2.00	0.00	-2.00
Start 8823.2 hold at 11639.1 MD									
11,700.0	89.80	90.00	10,700.5	-188.3	1,237.7	1,237.7	0.00	0.00	0.00
11,800.0	89.80	90.00	10,700.9	-188.3	1,337.7	1,337.7	0.00	0.00	0.00
11,900.0	89.80	90.00	10,701.2	-188.2	1,437.7	1,437.7	0.00	0.00	0.00
12,000.0	89.80	90.00	10,701.6	-188.2	1,537.7	1,537.7	0.00	0.00	0.00
12,100.0	89.80	90.00	10,701.9	-188.2	1,637.7	1,637.7	0.00	0.00	0.00
12,200.0	89.80	90.00	10,702.3	-188.2	1,737.7	1,737.7	0.00	0.00	0.00
12,300.0	89.80	90.00	10,702.6	-188.2	1,837.7	1,837.7	0.00	0.00	0.00
12,400.0	89.80	90.00	10,703.0	-188.2	1,937.7	1,937.7	0.00	0.00	0.00
12,500.0	89.80	90.00	10,703.3	-188.2	2,037.7	2,037.7	0.00	0.00	0.00
12,600.0	89.80	90.00	10,703.6	-188.2	2,137.7	2,137.7	0.00	0.00	0.00
12,700.0	89.80	90.00	10,704.0	-188.2	2,237.7	2,237.7	0.00	0.00	0.00
12,800.0	89.80	90.00	10,704.3	-188.2	2,337.7	2,337.7	0.00	0.00	0.00
12,900.0	89.80	90.00	10,704.7	-188.2	2,437.7	2,437.7	0.00	0.00	0.00
13,000.0	89.80	90.00	10,705.0	-188.2	2,537.7	2,537.7	0.00	0.00	0.00
13,100.0	89.80	90.00	10,705.4	-188.2	2,637.7	2,637.7	0.00	0.00	0.00
13,200.0	89.80	90.00	10,705.7	-188.2	2,737.7	2,737.7	0.00	0.00	0.00
13,300.0	89.80	90.00	10,706.1	-188.2	2,837.7	2,837.7	0.00	0.00	0.00
13,400.0	89.80	90.00	10,706.4	-188.2	2,937.7	2,937.7	0.00	0.00	0.00
13,500.0	89.80	90.00	10,706.8	-188.2	3,037.7	3,037.7	0.00	0.00	0.00
13,600.0	89.80	90.00	10,707.1	-188.2	3,137.7	3,137.7	0.00	0.00	0.00
13,700.0	89.80	90.00	10,707.5	-188.2	3,237.7	3,237.7	0.00	0.00	0.00
13,800.0	89.80	90.00	10,707.8	-188.2	3,337.7	3,337.7	0.00	0.00	0.00

Database:	OpenWellsCompass - EDM Prod	**Local Co-ordinate Reference:**	Well Kline Federal 5300 31-18 8B
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 8B	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Kline Federal 5300 31-18 8B		
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)
13,900.0	89.80	90.00	10,708.2	-188.2	3,437.7	3,437.7	0.00	0.00	0.00
14,000.0	89.80	90.00	10,708.5	-188.2	3,537.7	3,537.7	0.00	0.00	0.00
14,100.0	89.80	90.00	10,708.9	-188.2	3,637.7	3,637.7	0.00	0.00	0.00
14,200.0	89.80	90.00	10,709.2	-188.2	3,737.7	3,737.7	0.00	0.00	0.00
14,300.0	89.80	90.00	10,709.6	-188.2	3,837.7	3,837.7	0.00	0.00	0.00
14,400.0	89.80	90.00	10,709.9	-188.2	3,937.7	3,937.7	0.00	0.00	0.00
14,500.0	89.80	90.00	10,710.3	-188.2	4,037.7	4,037.7	0.00	0.00	0.00
14,600.0	89.80	90.00	10,710.6	-188.2	4,137.7	4,137.7	0.00	0.00	0.00
14,700.0	89.80	90.00	10,711.0	-188.2	4,237.7	4,237.7	0.00	0.00	0.00
14,800.0	89.80	90.00	10,711.3	-188.2	4,337.7	4,337.7	0.00	0.00	0.00
14,900.0	89.80	90.00	10,711.7	-188.2	4,437.7	4,437.7	0.00	0.00	0.00
15,000.0	89.80	90.00	10,712.0	-188.2	4,537.7	4,537.7	0.00	0.00	0.00
15,100.0	89.80	90.00	10,712.3	-188.2	4,637.7	4,637.7	0.00	0.00	0.00
15,200.0	89.80	90.00	10,712.7	-188.1	4,737.7	4,737.7	0.00	0.00	0.00
15,300.0	89.80	90.00	10,713.0	-188.1	4,837.7	4,837.7	0.00	0.00	0.00
15,400.0	89.80	90.00	10,713.4	-188.1	4,937.7	4,937.7	0.00	0.00	0.00
15,500.0	89.80	90.00	10,713.7	-188.1	5,037.7	5,037.7	0.00	0.00	0.00
15,600.0	89.80	90.00	10,714.1	-188.1	5,137.7	5,137.7	0.00	0.00	0.00
15,700.0	89.80	90.00	10,714.4	-188.1	5,237.7	5,237.7	0.00	0.00	0.00
15,800.0	89.80	90.00	10,714.8	-188.1	5,337.7	5,337.7	0.00	0.00	0.00
15,900.0	89.80	90.00	10,715.1	-188.1	5,437.7	5,437.7	0.00	0.00	0.00
16,000.0	89.80	90.00	10,715.5	-188.1	5,537.7	5,537.7	0.00	0.00	0.00
16,100.0	89.80	90.00	10,715.8	-188.1	5,637.7	5,637.7	0.00	0.00	0.00
16,200.0	89.80	90.00	10,716.2	-188.1	5,737.7	5,737.7	0.00	0.00	0.00
16,300.0	89.80	90.00	10,716.5	-188.1	5,837.7	5,837.7	0.00	0.00	0.00
16,400.0	89.80	90.00	10,716.9	-188.1	5,937.7	5,937.7	0.00	0.00	0.00
16,500.0	89.80	90.00	10,717.2	-188.1	6,037.7	6,037.7	0.00	0.00	0.00
16,600.0	89.80	90.00	10,717.6	-188.1	6,137.7	6,137.7	0.00	0.00	0.00
16,700.0	89.80	90.00	10,717.9	-188.1	6,237.7	6,237.7	0.00	0.00	0.00
16,800.0	89.80	90.00	10,718.3	-188.1	6,337.7	6,337.7	0.00	0.00	0.00
16,900.0	89.80	90.00	10,718.6	-188.1	6,437.7	6,437.7	0.00	0.00	0.00
17,000.0	89.80	90.00	10,719.0	-188.1	6,537.7	6,537.7	0.00	0.00	0.00
17,100.0	89.80	90.00	10,719.3	-188.1	6,637.7	6,637.7	0.00	0.00	0.00
17,200.0	89.80	90.00	10,719.7	-188.1	6,737.7	6,737.7	0.00	0.00	0.00
17,300.0	89.80	90.00	10,720.0	-188.1	6,837.7	6,837.7	0.00	0.00	0.00
17,400.0	89.80	90.00	10,720.3	-188.1	6,937.7	6,937.7	0.00	0.00	0.00
17,500.0	89.80	90.00	10,720.7	-188.1	7,037.7	7,037.7	0.00	0.00	0.00
17,600.0	89.80	90.00	10,721.0	-188.1	7,137.7	7,137.7	0.00	0.00	0.00
17,700.0	89.80	90.00	10,721.4	-188.1	7,237.7	7,237.7	0.00	0.00	0.00
17,800.0	89.80	90.00	10,721.7	-188.1	7,337.7	7,337.7	0.00	0.00	0.00
17,900.0	89.80	90.00	10,722.1	-188.1	7,437.7	7,437.7	0.00	0.00	0.00
18,000.0	89.80	90.00	10,722.4	-188.1	7,537.7	7,537.7	0.00	0.00	0.00
18,100.0	89.80	90.00	10,722.8	-188.1	7,637.7	7,637.7	0.00	0.00	0.00
18,200.0	89.80	90.00	10,723.1	-188.1	7,737.7	7,737.7	0.00	0.00	0.00
18,300.0	89.80	90.00	10,723.5	-188.1	7,837.7	7,837.7	0.00	0.00	0.00
18,400.0	89.80	90.00	10,723.8	-188.1	7,937.7	7,937.7	0.00	0.00	0.00
18,500.0	89.80	90.00	10,724.2	-188.1	8,037.7	8,037.7	0.00	0.00	0.00
18,600.0	89.80	90.00	10,724.5	-188.0	8,137.7	8,137.7	0.00	0.00	0.00
18,700.0	89.80	90.00	10,724.9	-188.0	8,237.7	8,237.7	0.00	0.00	0.00
18,800.0	89.80	90.00	10,725.2	-188.0	8,337.7	8,337.7	0.00	0.00	0.00
18,900.0	89.80	90.00	10,725.6	-188.0	8,437.7	8,437.7	0.00	0.00	0.00
19,000.0	89.80	90.00	10,725.9	-188.0	8,537.7	8,537.7	0.00	0.00	0.00
19,100.0	89.80	90.00	10,726.3	-168.0	8,637.7	8,637.7	0.00	0.00	0.00
19,200.0	89.80	90.00	10,726.6	-188.0	8,737.7	8,737.7	0.00	0.00	0.00
19,300.0	89.80	90.00	10,727.0	-188.0	8,837.7	8,837.7	0.00	0.00	0.00

Database:	OpenWellsCompass - EDM Prod	**Local Co-ordinate Reference:**	Well Kline Federal 5300 31-18 8B
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 8B	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Kline Federal 5300 31-18 8B		
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)
19,400.0	89.80	90.00	10,727.3	-188.0	8,937.7	8,937.7	0.00	0.00	0.00
19,500.0	89.80	90.00	10,727.7	-188.0	9,037.7	9,037.7	0.00	0.00	0.00
19,600.0	89.80	90.00	10,728.0	-188.0	9,137.7	9,137.7	0.00	0.00	0.00
19,700.0	89.80	90.00	10,728.3	-188.0	9,237.7	9,237.7	0.00	0.00	0.00
19,800.0	89.80	90.00	10,728.7	-188.0	9,337.6	9,337.6	0.00	0.00	0.00
19,900.0	89.80	90.00	10,729.0	-188.0	9,437.6	9,437.6	0.00	0.00	0.00
20,000.0	89.80	90.00	10,729.4	-188.0	9,537.6	9,537.6	0.00	0.00	0.00
20,100.0	89.80	90.00	10,729.7	-188.0	9,837.6	9,637.6	0.00	0.00	0.00
20,200.0	89.80	90.00	10,730.1	-188.0	9,737.6	9,737.6	0.00	0.00	0.00
20,300.0	89.80	90.00	10,730.4	-188.0	9,837.6	9,837.6	0.00	0.00	0.00
20,400.0	89.80	90.00	10,730.8	-188.0	9,937.6	9,937.6	0.00	0.00	0.00
20,462.4	89.80	90.00	10,731.0	-188.0	10,000.0	10,000.0	0.00	0.00	0.00

TD at 20462.4 - 5300 31-18 8B 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 8B PBHL - plan hits target center - Point	0.00	0.00	10,731.0	-188.0	10,000.0	406,630.97	1,220,075.34	48° 4' 26.278 N	103° 33' 44.121 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
6,437.2	6,437.0	9 5/8"	9.625	12.250
10,969.0	10,698.0	7"	7.000	8.750

Database:	OpenWellsCompass - EDM Prod	**Local Co-ordinate Reference:**	Well Kline Federal 5300 31-18 8B
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 8B	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Kline Federal 5300 31-18 8B		
Design:	Design #2		

Formations

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
1,923.0	1,923.0	Pierre			
4,597.1	4,597.0	Greenhorn			
5,008.1	5,008.0	Mowry			
5,422.1	5,422.0	Dakota			
6,437.2	6,437.0	Rierdon			
6,765.2	6,765.0	Dunham Salt			
6,880.2	6,880.0	Dunham Salt Base			
6,975.2	6,975.0	Spearfish			
7,234.2	7,234.0	Pine Salt			
7,269.2	7,269.0	Pine Salt Base			
7,325.2	7,325.0	Opeche Salt			
7,354.2	7,354.0	Opeche Salt Base			
7,556.2	7,556.0	Broom Creek (Top of Minnelusa Gp.)			
7,635.2	7,635.0	Amsden			
7,804.2	7,804.0	Tyler			
7,998.2	7,998.0	Otter (Base of Minnelusa Gp.)			
8,341.2	8,341.0	Kibbey Lime			
8,493.2	8,493.0	Charles Salt			
9,110.2	9,110.0	UB			
9,181.2	9,181.0	Base Last Salt			
9,244.2	9,244.0	Ratcliffe			
9,387.2	9,387.0	Mission Canyon			
9,955.2	9,955.0	Lodgepole			
10,142.2	10,142.0	Lodgepole Fracture Zone			
10,776.5	10,659.0	False Bakken			
10,800.7	10,668.0	Upper Bakken			
10,855.0	10,684.0	Middle Bakken			
10,901.8	10,693.0	Middle Bakken Sand Target			
12,413.4	10,703.0	Base Middle Bakken Sand Target			
16,725.3	10,718.0	Lower Bakken			

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	Local Coordinates +E/-W (usft)	Comment
2,150.0	2,150.0	0.0	0.0	Start Build 5.00
2,160.0	2,160.0	0.0	0.0	Start 5719.7 hold at 2160.0 MD
7,879.7	7,879.4	0.0	50.0	Start Drop -5.00
7,889.7	7,889.4	0.0	50.0	Start 2331.1 hold at 7889.7 MD
10,220.7	10,220.5	0.0	50.0	Start Build 12.00
10,969.0	10,698.0	-110.3	512.8	Start DLS 2.00 TFO -90.02
11,639.1	10,700.3	-188.3	1,176.8	Start 8823.2 hold at 11639.1 MD
20,462.4	10,731.0	-188.0	10,000.0	TD at 20462.4

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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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

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

Drawn By: B.H.H. Project No.: S14-09-109.06
Checked By: D.D.K. Date: JAN. 2015

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

SECTION BREAKDOWN

OASIS PETROLEUM NORTH AMERICA, LLC
1001 FANNIN, SUITE 1500, HOUSTON, TX 77002
"KLINE FEDERAL 5300 31-18 8B"
2523 FEET FROM SOUTH LINE AND 238 FEET FROM WEST LINE
SECTIONS 17 & 18, T153N, R100W, 5th P.M., MCKENZIE COUNTY, NORTH DAKOTA

0 1000
1" = 1000'

- MONUMENT – RECOVERED
- MONUMENT – NOT RECOVERED

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

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	BKH	CHANGED WELL NAMES & SHL
REV 2	2/05/15	JS	UPDATED ACCESS ROAD ROUTE

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

Drawn By: BJKH Project No.: S14-05-105.02
Checked By: DJSK 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
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ACCESS APPROACH

OASIS PETROLEUM NORTH AMERICA, LLC
1001 FANNIN, SUITE 1500, HOUSTON, TX 77002
"KLINE FEDERAL 5300 31-18 8B"
2523 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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0 500
1" = 500'

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

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

Drawn By: B.H.H. | Project No.: S14-09-108.02
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

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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.: S14-09-109.02
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	JAS	UPDATED ACCESS ROAD ROUTE

COUNTY ROAD MAP

OASIS PETROLEUM NORTH AMERICA, LLC
1001 FANNIN, SUITE 1500, HOUSTON, TX 77002
"KLINE FEDERAL 5300 31-18 8B"
2523 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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Fax (406) 433-5618
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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.: S14-09-109.02
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 8B"
2523 FEET FROM SOUTH LINE AND 238 FEET FROM WEST LINE
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: 2/05/15
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

Drawn By: B.H.H. | Project No.: S14-09-109.02
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

WELL LOCATION SITE QUANTITIES

OASIS PETROLEUM NORTH AMERICA, LLC
1001 FANNIN, SUITE 1500, HOUSTON, TX 77002
"KLINE FEDERAL 5300 31-18 8B"
2523 FEET FROM SOUTH LINE AND 238 FEET FROM WEST LINE
SECTION 18, T153N, R100W, 5th P.M., MCKENZIE COUNTY, NORTH DAKOTA

WELL SITE ELEVATION	2025.9
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
2523' FSL
238' FWL

BERM DETAIL

DIVERSION DITCH DETAIL

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Fax (406) 433-5618
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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.: S14-09-109.02
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)

JUL 2014 RECEIVED ND OIL & GAS DIVISION

Well File No. **28754**

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 8T					
Footages		Qtr-Qtr	Section	Township	Range
2523 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 Richard Suggs	
Title Petroleum Resource Specialist	

Oasis

Indian Hills
153N-100W-17/18
Kline Federal 5300 31-18 8T

Kline Federal 5300 31-18 8T
Design #1

Anticollision Report

18 July, 2014

Anticollision Report

Company:	Oasis	**Local Co-ordinate Reference:**	Well Kline Federal 5300 31-18 8T
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 8T	**Survey Calculation Method:**	Minimum Curvature
Well Error:	2.0 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	Kline Federal 5300 31-18 8T	**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	20,656.4	Design #1 (Kline Federal 5300 31-18 8T)	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	65.9	55.5	6.328	CC
Kline Federal 5300 31-18 6B - Kline Federal 5300 31-18	20,656.4	20,694.5	507.7	-69.9	0.879	Level 1, ES, SF
Kline Federal 5300 31-18 7T2 - Kline Federal 5300 31-1ε	2,200.0	2,200.0	32.4	22.0	3.115	CC
Kline Federal 5300 31-18 7T2 - Kline Federal 5300 31-1ε	20,656.4	20,831.5	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

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
0.0	0.0	0.0	0.0	2.0	2.0	180.00	-65.9	0.0	65.9				
100.0	100.0	100.0	100.0	2.0	2.0	180.00	-65.9	0.0	65.9	61.9	4.00	16.451	
200.0	200.0	200.0	200.0	2.0	2.0	180.00	-65.9	0.0	65.9	61.8	4.05	16.272	
300.0	300.0	300.0	300.0	2.1	2.1	180.00	-65.9	0.0	65.9	61.7	4.14	15.908	
400.0	400.0	400.0	400.0	2.1	2.1	180.00	-65.9	0.0	65.9	61.6	4.28	15.395	
500.0	500.0	500.0	500.0	2.2	2.2	180.00	-65.9	0.0	65.9	61.4	4.46	14.776	
600.0	600.0	600.0	600.0	2.3	2.3	180.00	-65.9	0.0	65.9	61.2	4.67	14.094	
700.0	700.0	700.0	700.0	2.5	2.5	180.00	-65.9	0.0	65.9	60.9	4.92	13.385	
800.0	800.0	800.0	800.0	2.6	2.6	180.00	-65.9	0.0	65.9	60.7	5.20	12.677	
900.0	900.0	900.0	900.0	2.7	2.7	180.00	-65.9	0.0	65.9	60.4	5.49	11.990	
1,000.0	1,000.0	1,000.0	1,000.0	2.9	2.9	180.00	-65.9	0.0	65.9	60.1	5.81	11.335	
1,100.0	1,100.0	1,100.0	1,100.0	3.1	3.1	180.00	-65.9	0.0	65.9	59.7	6.14	10.719	
1,200.0	1,200.0	1,200.0	1,200.0	3.2	3.2	180.00	-65.9	0.0	65.9	59.4	6.49	10.145	
1,300.0	1,300.0	1,300.0	1,300.0	3.4	3.4	180.00	-65.9	0.0	65.9	59.0	6.85	9.612	
1,400.0	1,400.0	1,400.0	1,400.0	3.6	3.6	180.00	-65.9	0.0	65.9	58.6	7.22	9.120	
1,500.0	1,500.0	1,500.0	1,500.0	3.8	3.8	180.00	-65.9	0.0	65.9	58.3	7.60	8.666	
1,600.0	1,600.0	1,600.0	1,600.0	4.0	4.0	180.00	-65.9	0.0	65.9	57.9	7.99	8.247	
1,700.0	1,700.0	1,700.0	1,700.0	4.2	4.2	180.00	-65.9	0.0	65.9	57.5	8.38	7.861	
1,800.0	1,800.0	1,800.0	1,800.0	4.4	4.4	180.00	-65.9	0.0	65.9	57.1	8.78	7.505	
1,900.0	1,900.0	1,900.0	1,900.0	4.6	4.6	180.00	-65.9	0.0	65.9	56.7	9.18	7.176	
2,000.0	2,000.0	2,000.0	2,000.0	4.8	4.8	180.00	-65.9	0.0	65.9	56.3	9.58	6.872	
2,100.0	2,100.0	2,100.0	2,100.0	5.0	5.0	180.00	-65.9	0.0	65.9	55.9	9.99	6.590	
2,200.0	2,200.0	2,200.0	2,200.0	5.2	5.2	180.00	-65.9	0.0	65.9	55.5	10.41	6.328	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 8T
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 8T	Survey Calculation Method:	Minimum Curvature
Well Error:	2.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Kline Federal 5300 31-18 8T	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
2,216.7	2,216.7	2,216.1	2,216.1	5.2	5.2	180.00	-65.9	0.0	66.0	55.5	10.47	6.303	
2,300.0	2,300.0	2,299.4	2,299.4	5.4	5.4	180.00	-66.7	0.0	67.5	56.7	10.77	6.261	
2,400.0	2,400.0	2,399.4	2,399.4	5.6	5.5	180.00	-67.5	0.0	69.2	58.1	11.14	6.210	
2,500.0	2,500.0	2,499.4	2,499.4	5.8	5.7	180.00	-68.4	0.0	70.9	59.4	11.52	6.159	
2,600.0	2,600.0	2,599.4	2,599.4	6.0	5.9	180.00	-69.3	0.0	72.7	60.8	11.90	6.109	
2,700.0	2,700.0	2,699.4	2,699.3	6.3	6.0	180.00	-70.1	0.0	74.4	62.2	12.28	6.060	
2,800.0	2,800.0	2,799.3	2,799.3	6.5	6.2	180.00	-71.0	0.0	76.2	63.5	12.67	6.012	
2,900.0	2,900.0	2,899.3	2,899.3	6.7	6.4	180.00	-71.9	0.0	77.9	64.9	13.06	5.965	
3,000.0	3,000.0	2,999.3	2,999.3	6.9	6.6	180.00	-72.8	0.0	79.7	66.2	13.46	5.919	
3,100.0	3,100.0	3,099.3	3,099.3	7.1	6.7	180.00	-73.6	0.0	81.4	67.6	13.86	5.875	
3,200.0	3,200.0	3,199.3	3,199.2	7.3	6.9	180.00	-74.5	0.0	83.2	68.9	14.26	5.831	
3,300.0	3,300.0	3,299.3	3,299.2	7.5	7.1	180.00	-75.4	0.0	84.9	70.2	14.67	5.789	
3,400.0	3,400.0	3,399.2	3,399.2	7.8	7.3	180.00	-76.3	0.0	86.7	71.6	15.07	5.749	
3,500.0	3,500.0	3,499.2	3,499.2	8.0	7.5	180.00	-77.1	0.0	88.4	72.9	15.48	5.709	
3,600.0	3,599.9	3,599.2	3,599.2	8.2	7.7	180.00	-78.0	0.0	90.1	74.3	15.90	5.671	
3,700.0	3,699.9	3,699.2	3,699.1	8.4	7.9	180.00	-78.9	0.0	91.9	75.6	16.31	5.634	
3,800.0	3,799.9	3,799.2	3,799.1	8.6	8.1	180.00	-79.7	0.0	93.6	76.9	16.73	5.598	
3,900.0	3,899.9	3,899.2	3,899.1	8.9	8.3	180.00	-80.6	0.0	95.4	78.2	17.14	5.564	
4,000.0	3,999.9	3,999.2	3,999.1	9.1	8.5	180.00	-81.5	0.0	97.1	79.6	17.56	5.530	
4,100.0	4,099.9	4,099.1	4,099.1	9.3	8.7	180.00	-82.4	0.0	98.9	80.9	17.98	5.498	
4,200.0	4,199.9	4,199.1	4,199.0	9.5	8.9	180.00	-83.2	0.0	100.6	82.2	18.41	5.467	
4,300.0	4,299.9	4,299.1	4,299.0	9.7	9.1	180.00	-84.1	0.0	102.4	83.5	18.83	5.437	
4,400.0	4,399.9	4,399.1	4,399.0	10.0	9.3	180.00	-85.0	0.0	104.1	84.9	19.25	5.407	
4,500.0	4,499.9	4,499.1	4,499.0	10.2	9.5	180.00	-85.9	0.0	105.9	86.2	19.68	5.379	
4,600.0	4,599.9	4,599.1	4,599.0	10.4	9.7	180.00	-86.7	0.0	107.6	87.5	20.11	5.352	
4,700.0	4,699.9	4,699.0	4,699.0	10.6	9.9	180.00	-87.6	0.0	109.3	88.8	20.53	5.325	
4,800.0	4,799.9	4,799.0	4,798.9	10.8	10.1	180.00	-88.5	0.0	111.1	90.1	20.96	5.300	
4,900.0	4,899.9	4,899.0	4,898.9	11.1	10.3	180.00	-89.3	0.0	112.8	91.4	21.39	5.275	
5,000.0	4,999.9	4,999.0	4,998.9	11.3	10.6	180.00	-90.2	0.0	114.6	92.8	21.82	5.251	
5,100.0	5,099.9	5,099.0	5,098.9	11.5	10.8	180.00	-91.1	0.0	116.3	94.1	22.25	5.227	
5,200.0	5,199.9	5,199.0	5,198.9	11.7	11.0	180.00	-92.0	0.0	118.1	95.4	22.68	5.205	
5,300.0	5,299.9	5,299.0	5,298.8	11.9	11.2	180.00	-92.8	0.0	119.8	96.7	23.12	5.183	
5,400.0	5,399.9	5,398.9	5,398.8	12.2	11.4	180.00	-93.7	0.0	121.6	98.0	23.55	5.162	
5,500.0	5,499.9	5,498.9	5,498.8	12.4	11.6	180.00	-94.6	0.0	123.3	99.3	23.98	5.141	
5,600.0	5,599.9	5,598.9	5,598.8	12.6	11.8	180.00	-95.4	0.0	125.1	100.6	24.42	5.121	
5,700.0	5,699.9	5,698.9	5,698.8	12.8	12.0	180.00	-96.3	0.0	126.8	101.9	24.85	5.102	
5,800.0	5,799.9	5,798.9	5,798.7	13.1	12.3	180.00	-97.2	0.0	128.5	103.3	25.29	5.083	
5,900.0	5,899.9	5,898.9	5,898.7	13.3	12.5	180.00	-98.1	0.0	130.3	104.6	25.72	5.065	
6,000.0	5,999.9	5,998.8	5,998.7	13.5	12.7	180.00	-98.9	0.0	132.0	105.9	26.16	5.047	
6,100.0	6,099.9	6,098.8	6,098.7	13.7	12.9	180.00	-99.8	0.0	133.8	107.2	26.60	5.030	
6,200.0	6,199.8	6,198.8	6,198.7	13.9	13.1	180.00	-100.7	0.0	135.5	108.5	27.04	5.013	
6,300.0	6,299.8	6,298.8	6,298.6	14.2	13.3	180.00	-101.6	0.0	137.3	109.8	27.47	4.996	
6,400.0	6,399.8	6,398.8	6,398.6	14.4	13.6	180.00	-102.4	0.0	139.0	111.1	27.91	4.981	
6,500.0	6,499.8	6,498.8	6,498.6	14.6	13.8	180.00	-103.3	0.0	140.8	112.4	28.35	4.965	
6,600.0	6,599.8	6,598.8	6,598.6	14.8	14.0	180.00	-104.2	0.0	142.5	113.7	28.79	4.950	
6,700.0	6,699.8	6,698.7	6,698.6	15.1	14.2	180.00	-105.0	0.0	144.2	115.0	29.23	4.935	
6,800.0	6,799.8	6,798.7	6,798.6	15.3	14.4	180.00	-105.9	0.0	146.0	116.3	29.67	4.921	
6,900.0	6,899.8	6,898.7	6,898.5	15.5	14.6	180.00	-106.8	0.0	147.7	117.6	30.11	4.907	
7,000.0	6,999.8	6,998.7	6,998.5	15.7	14.9	180.00	-107.7	0.0	149.5	118.9	30.55	4.894	
7,100.0	7,099.8	7,098.7	7,098.5	15.9	15.1	180.00	-108.5	0.0	151.2	120.2	30.99	4.880	
7,200.0	7,199.8	7,198.7	7,198.5	16.2	15.3	180.00	-109.4	0.0	153.0	121.5	31.43	4.868	
7,300.0	7,299.8	7,298.6	7,298.5	16.4	15.5	180.00	-110.3	0.0	154.7	122.9	31.87	4.855	

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 8T
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 8T	Survey Calculation Method:	Minimum Curvature
Well Error:	2.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Kline Federal 5300 31-18 8T	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
7,400.0	7,399.8	7,398.6	7,398.4	16.6	15.7	180.00	-111.2	0.0	156.5	124.2	32.31	4.843	
7,500.0	7,499.8	7,498.6	7,498.4	16.8	16.0	180.00	-112.0	0.0	158.2	125.5	32.75	4.831	
7,600.0	7,599.8	7,598.6	7,598.4	17.1	16.2	180.00	-112.9	0.0	160.0	126.8	33.19	4.819	
7,700.0	7,699.8	7,698.6	7,698.4	17.3	16.4	180.00	-113.8	0.0	161.7	128.1	33.63	4.808	
7,800.0	7,799.8	7,798.6	7,798.4	17.5	16.6	180.00	-114.6	0.0	163.4	129.4	34.08	4.796	
7,900.0	7,899.8	7,898.6	7,898.3	17.7	16.8	180.00	-115.5	0.0	165.2	130.7	34.52	4.786	
7,926.7	7,926.4	7,925.2	7,925.0	17.8	16.9	180.00	-115.7	0.0	165.7	131.0	34.64	4.783	
7,943.3	7,943.1	7,943.3	7,943.1	17.8	16.9	180.00	-115.8	0.0	165.8	131.1	34.74	4.773	
8,000.0	7,999.8	8,000.0	7,999.8	17.9	17.1	180.00	-115.8	0.0	165.8	130.8	34.96	4.742	
8,100.0	8,099.8	8,100.0	8,099.8	18.2	17.2	180.00	-115.8	0.0	165.8	130.4	35.38	4.687	
8,200.0	8,199.8	8,200.0	8,199.8	18.4	17.4	180.00	-115.8	0.0	165.8	130.0	35.79	4.633	
8,300.0	8,299.8	8,300.0	8,299.8	18.6	17.6	180.00	-115.8	0.0	165.8	129.6	36.21	4.580	
8,400.0	8,399.8	8,400.0	8,399.8	18.8	17.8	180.00	-115.8	0.0	165.8	129.2	36.62	4.528	
8,500.0	8,499.8	8,500.0	8,499.8	19.1	18.0	180.00	-115.8	0.0	165.8	128.8	37.04	4.477	
8,600.0	8,599.8	8,600.0	8,599.8	19.3	18.2	180.00	-115.8	0.0	165.8	128.4	37.45	4.427	
8,700.0	8,699.8	8,700.0	8,699.8	19.5	18.4	180.00	-115.8	0.0	165.8	127.9	37.87	4.378	
8,800.0	8,799.8	8,800.0	8,799.8	19.7	18.6	180.00	-115.8	0.0	165.8	127.5	38.29	4.330	
8,900.0	8,899.8	8,900.0	8,899.8	19.9	18.8	180.00	-115.8	0.0	165.8	127.1	38.71	4.283	
9,000.0	8,999.8	9,000.0	8,999.8	20.2	19.0	180.00	-115.8	0.0	165.8	126.7	39.13	4.237	
9,100.0	9,099.8	9,100.0	9,099.8	20.4	19.2	180.00	-115.8	0.0	165.8	126.3	39.55	4.192	
9,200.0	9,199.8	9,200.0	9,199.8	20.6	19.4	180.00	-115.8	0.0	165.8	125.8	39.97	4.148	
9,300.0	9,299.8	9,300.0	9,299.8	20.8	19.6	180.00	-115.8	0.0	165.8	125.4	40.39	4.105	
9,400.0	9,399.8	9,400.0	9,399.8	21.1	19.8	180.00	-115.8	0.0	165.8	125.0	40.82	4.062	
9,500.0	9,499.8	9,500.0	9,499.8	21.3	20.0	180.00	-115.8	0.0	165.8	124.6	41.24	4.021	
9,600.0	9,599.8	9,600.0	9,599.8	21.5	20.2	180.00	-115.8	0.0	165.8	124.1	41.66	3.980	
9,700.0	9,699.8	9,700.0	9,699.8	21.7	20.4	180.00	-115.8	0.0	165.8	123.7	42.09	3.940	
9,800.0	9,799.8	9,800.0	9,799.8	22.0	20.6	180.00	-115.8	0.0	165.8	123.3	42.51	3.900	
9,900.0	9,899.8	9,900.0	9,899.8	22.2	20.8	180.00	-115.8	0.0	165.8	122.9	42.94	3.862	
10,000.0	9,999.8	10,000.0	9,999.8	22.4	21.0	180.00	-115.8	0.0	165.8	122.4	43.36	3.824	
10,100.0	10,099.8	10,100.0	10,099.8	22.6	21.2	180.00	-115.8	0.0	165.8	122.0	43.79	3.786	
10,200.0	10,199.8	10,200.0	10,199.8	22.9	21.4	180.00	-115.8	0.0	165.8	121.6	44.22	3.750	
10,200.4	10,200.2	10,200.4	10,200.2	22.9	21.4	180.00	-115.8	0.0	165.8	121.6	44.22	3.750	
10,287.8	10,287.6	10,278.7	10,278.3	23.1	21.6	179.24	-117.2	2.2	167.4	122.8	44.58	3.756	
10,300.0	10,299.8	10,288.9	10,288.5	23.1	21.6	69.36	-117.8	3.2	168.1	123.5	44.62	3.768	
10,325.0	10,324.7	10,309.8	10,309.2	23.1	21.6	68.65	-119.4	5.9	169.6	124.9	44.70	3.795	
10,350.0	10,349.6	10,330.6	10,329.6	23.2	21.7	68.02	-121.4	9.3	171.3	126.5	44.76	3.827	
10,375.0	10,374.3	10,350.0	10,348.5	23.2	21.7	67.49	-123.7	13.1	173.1	128.3	44.81	3.862	
10,400.0	10,398.8	10,372.0	10,369.7	23.3	21.8	67.00	-126.8	18.3	175.0	130.1	44.85	3.901	
10,425.0	10,422.9	10,392.7	10,389.2	23.3	21.8	66.61	-130.2	23.9	176.9	132.1	44.88	3.943	
10,450.0	10,446.7	10,413.2	10,408.5	23.4	21.9	66.30	-134.0	30.1	179.0	134.1	44.89	3.988	
10,475.0	10,470.0	10,433.8	10,427.3	23.4	21.9	66.07	-138.2	37.1	181.2	136.3	44.90	4.036	
10,500.0	10,492.9	10,454.2	10,445.7	23.5	22.0	65.91	-142.8	44.7	183.4	138.5	44.89	4.086	
10,525.0	10,515.1	10,475.0	10,464.0	23.6	22.0	65.82	-147.9	53.2	185.7	140.9	44.88	4.139	
10,550.0	10,536.8	10,495.1	10,481.2	23.6	22.1	65.79	-153.1	62.0	188.1	143.3	44.87	4.193	
10,575.0	10,557.8	10,515.4	10,498.3	23.7	22.1	65.83	-158.9	71.5	190.6	145.7	44.86	4.248	
10,600.0	10,578.0	10,535.8	10,514.8	23.8	22.2	65.94	-165.0	81.7	193.1	148.2	44.86	4.303	
10,625.0	10,597.4	10,556.1	10,530.8	23.8	22.3	66.10	-171.5	92.4	195.6	150.8	44.88	4.359	
10,650.0	10,616.0	10,575.0	10,545.2	23.9	22.3	66.27	-177.8	102.9	198.3	153.4	44.91	4.415	
10,675.0	10,633.7	10,596.7	10,561.1	24.0	22.4	66.58	-185.4	115.5	200.9	156.0	44.97	4.468	
10,700.0	10,650.5	10,617.0	10,575.4	24.2	22.5	66.89	-192.8	127.9	203.7	158.6	45.06	4.521	
10,725.0	10,666.2	10,637.3	10,589.0	24.3	22.6	67.25	-200.6	140.8	206.5	161.3	45.18	4.571	
10,750.0	10,680.9	10,657.6	10,602.0	24.4	22.7	67.65	-208.6	154.2	209.4	164.0	45.33	4.618	

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 8T
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 8T	Survey Calculation Method:	Minimum Curvature
Well Error:	2.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Kline Federal 5300 31-18 8T	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
10,775.0	10,694.5	10,677.9	10,614.3	24.6	22.8	68.08	-217.0	168.0	212.3	166.8	45.53	4.663	
10,800.0	10,707.0	10,700.0	10,626.9	24.7	23.0	68.63	-226.3	183.5	215.3	169.5	45.79	4.702	
10,825.0	10,718.4	10,718.7	10,636.9	24.9	23.1	69.06	-234.5	197.0	218.3	172.3	46.05	4.741	
10,850.0	10,728.6	10,739.1	10,647.1	25.1	23.2	69.59	-243.6	212.2	221.5	175.1	46.39	4.774	
10,875.0	10,737.6	10,759.6	10,656.6	25.4	23.4	70.15	-253.0	227.8	224.6	177.9	46.77	4.803	
10,900.0	10,745.3	10,780.1	10,665.3	25.6	23.6	70.73	-262.6	243.7	227.9	180.7	47.19	4.829	
10,925.0	10,751.8	10,800.0	10,673.0	25.8	23.8	71.30	-272.0	259.4	231.2	183.6	47.65	4.852	
10,950.0	10,757.0	10,821.5	10,680.4	26.1	24.0	71.95	-282.4	276.7	234.6	186.4	48.18	4.869	
10,975.0	10,760.9	10,842.2	10,686.7	26.4	24.2	72.59	-292.6	293.7	238.1	189.3	48.74	4.884	
11,000.0	10,763.6	10,863.1	10,692.1	26.7	24.4	73.24	-303.0	310.9	241.6	192.2	49.33	4.897	
11,025.0	10,764.9	10,884.1	10,696.7	27.0	24.6	73.90	-313.6	328.5	245.2	195.2	49.97	4.907	
11,035.3	10,765.0	10,892.8	10,698.3	27.1	24.7	74.18	-318.0	335.8	246.7	196.4	50.24	4.910	
11,100.0	10,765.4	10,948.2	10,705.1	28.0	25.4	76.25	-346.4	382.9	258.0	205.9	52.05	4.957	
11,200.0	10,765.9	11,048.3	10,706.2	29.6	26.8	77.43	-397.2	469.1	280.4	225.4	55.00	5.099	
11,300.0	10,766.4	11,156.4	10,706.4	31.3	28.6	78.33	-448.9	564.0	303.1	244.7	58.35	5.194	
11,400.0	10,767.0	11,265.5	10,706.6	33.3	30.5	79.10	-497.4	661.7	325.5	263.5	62.04	5.247	
11,500.0	10,767.5	11,375.7	10,706.8	35.3	32.7	79.75	-542.5	762.2	347.7	281.7	65.98	5.270	
11,600.0	10,768.0	11,486.9	10,707.0	37.5	35.1	80.32	-584.2	865.3	369.6	299.4	70.14	5.269	
11,700.0	10,768.6	11,599.3	10,707.2	39.8	37.6	80.82	-622.1	971.1	391.1	316.6	74.45	5.253	
11,800.0	10,769.1	11,712.7	10,707.4	42.1	40.2	81.26	-656.2	1,079.2	412.2	333.3	78.89	5.224	
11,900.0	10,769.6	11,827.2	10,707.6	44.5	43.0	81.64	-686.3	1,189.7	432.8	349.4	83.42	5.188	
12,000.0	10,770.1	11,942.8	10,707.8	46.9	45.8	81.98	-712.1	1,302.4	452.9	364.9	87.98	5.148	
12,010.3	10,770.2	11,954.8	10,707.8	47.1	46.1	82.02	-714.5	1,314.1	455.0	366.5	88.45	5.144	
12,100.0	10,770.7	12,059.8	10,708.0	49.4	48.7	82.30	-733.6	1,417.4	471.1	377.8	93.31	5.049	
12,200.0	10,771.2	12,178.4	10,708.2	51.9	51.7	82.52	-750.5	1,534.8	485.4	386.5	98.88	4.909	
12,300.0	10,771.7	12,298.3	10,708.4	54.4	54.8	82.66	-762.7	1,654.0	495.5	390.9	104.57	4.739	
12,400.0	10,772.2	12,418.9	10,708.6	57.0	57.9	82.72	-770.0	1,774.4	501.5	391.2	110.36	4.544	
12,500.0	10,772.8	12,538.3	10,708.8	59.7	60.9	82.70	-772.1	1,893.8	503.3	387.2	116.15	4.333	
12,600.0	10,773.3	12,638.3	10,709.0	62.3	63.5	82.66	-772.1	1,993.8	503.4	381.9	121.48	4.144	
12,700.0	10,773.8	12,738.3	10,709.2	65.0	66.1	82.63	-772.1	2,093.8	503.4	376.6	126.85	3.969	
12,800.0	10,774.3	12,838.3	10,709.4	67.7	68.7	82.59	-772.1	2,193.8	503.5	371.2	132.26	3.807	
12,900.0	10,774.9	12,938.3	10,709.5	70.4	71.4	82.55	-772.1	2,293.8	503.5	365.8	137.69	3.657	
13,000.0	10,775.4	13,038.3	10,709.7	73.1	74.0	82.51	-772.1	2,393.8	503.6	360.4	143.16	3.518	
13,100.0	10,775.9	13,138.3	10,709.9	75.9	76.7	82.47	-772.1	2,493.8	503.6	355.0	148.65	3.388	
13,200.0	10,776.4	13,238.3	10,710.1	78.7	79.4	82.43	-772.1	2,593.8	503.7	349.5	154.16	3.267	
13,300.0	10,776.9	13,338.3	10,710.2	81.4	82.2	82.39	-772.1	2,693.8	503.7	344.0	159.69	3.154	
13,400.0	10,777.5	13,438.3	10,710.4	84.2	84.9	82.35	-772.1	2,793.8	503.7	338.5	165.23	3.049	
13,500.0	10,778.0	13,538.3	10,710.6	87.0	87.7	82.31	-772.1	2,893.8	503.8	333.0	170.80	2.950	
13,600.0	10,778.5	13,638.3	10,710.8	89.8	90.4	82.27	-772.1	2,993.8	503.8	327.5	176.37	2.857	
13,700.0	10,779.0	13,738.3	10,710.9	92.6	93.2	82.23	-772.1	3,093.8	503.9	321.9	181.96	2.769	
13,800.0	10,779.6	13,838.3	10,711.1	95.4	96.0	82.19	-772.1	3,193.8	503.9	316.4	187.57	2.687	
13,900.0	10,780.1	13,938.3	10,711.3	98.3	98.8	82.15	-772.1	3,293.8	504.0	310.8	193.18	2.609	
14,000.0	10,780.6	14,038.3	10,711.5	101.1	101.6	82.11	-772.1	3,393.8	504.0	305.2	198.80	2.535	
14,100.0	10,781.1	14,138.3	10,711.6	103.9	104.4	82.07	-772.1	3,493.8	504.1	299.6	204.43	2.466	
14,200.0	10,781.7	14,238.3	10,711.8	106.8	107.2	82.04	-772.1	3,593.8	504.1	294.1	210.06	2.400	
14,300.0	10,782.2	14,338.3	10,712.0	109.6	110.0	82.00	-772.1	3,693.8	504.2	288.5	215.71	2.337	
14,400.0	10,782.7	14,438.3	10,712.2	112.5	112.8	81.96	-772.1	3,793.8	504.2	282.9	221.36	2.278	
14,500.0	10,783.2	14,538.3	10,712.3	115.3	115.7	81.92	-772.1	3,893.8	504.3	277.3	227.01	2.221	
14,600.0	10,783.8	14,638.3	10,712.5	118.2	118.5	81.88	-772.1	3,993.8	504.3	271.6	232.68	2.167	
14,700.0	10,784.3	14,738.3	10,712.7	121.1	121.3	81.84	-772.1	4,093.8	504.4	266.0	238.34	2.116	
14,800.0	10,784.8	14,838.3	10,712.9	123.9	124.2	81.80	-772.1	4,193.8	504.4	260.4	244.01	2.067	
14,900.0	10,785.3	14,938.3	10,713.0	126.8	127.0	81.76	-772.1	4,293.8	504.5	254.8	249.69	2.020	

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 8T
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 8T	Survey Calculation Method:	Minimum Curvature
Well Error:	2.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Kline Federal 5300 31-18 8T	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

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
15,000.0	10,785.8	15,038.3	10,713.2	129.7	129.9	81.72	-772.1	4,393.8	504.5	249.2	255.36	1.976	
15,100.0	10,786.4	15,138.3	10,713.4	132.5	132.7	81.68	-772.1	4,493.8	504.6	243.5	261.05	1.933	
15,200.0	10,786.9	15,238.3	10,713.6	135.4	135.6	81.64	-772.1	4,593.8	504.6	237.9	266.73	1.892	
15,300.0	10,787.4	15,338.3	10,713.7	138.3	138.5	81.60	-772.1	4,693.8	504.7	232.3	272.42	1.853	
15,400.0	10,787.9	15,438.3	10,713.9	141.2	141.3	81.56	-772.1	4,793.8	504.7	226.6	278.11	1.815	
15,500.0	10,788.5	15,538.3	10,714.1	144.0	144.2	81.52	-772.1	4,893.8	504.8	221.0	283.80	1.779	
15,600.0	10,789.0	15,638.3	10,714.2	146.9	147.1	81.49	-772.1	4,993.8	504.8	215.3	289.49	1.744	
15,700.0	10,789.5	15,738.3	10,714.4	149.8	149.9	81.45	-772.1	5,093.8	504.9	209.7	295.19	1.710	
15,800.0	10,790.0	15,838.3	10,714.6	152.7	152.8	81.41	-772.1	5,193.8	504.9	204.0	300.89	1.678	
15,900.0	10,790.6	15,938.3	10,714.8	155.6	155.7	81.37	-772.1	5,293.8	505.0	198.4	306.58	1.647	
16,000.0	10,791.1	16,038.3	10,714.9	158.5	158.6	81.33	-772.1	5,393.8	505.0	192.7	312.28	1.617	
16,100.0	10,791.6	16,138.3	10,715.1	161.4	161.4	81.29	-772.1	5,493.8	505.1	187.1	317.99	1.588	
16,200.0	10,792.1	16,238.3	10,715.3	164.3	164.3	81.25	-772.1	5,593.8	505.1	181.4	323.69	1.561	
16,300.0	10,792.7	16,338.3	10,715.5	167.2	167.2	81.21	-772.1	5,693.8	505.2	175.8	329.39	1.534	
16,400.0	10,793.2	16,438.3	10,715.6	170.1	170.1	81.17	-772.1	5,793.8	505.2	170.1	335.10	1.508	
16,500.0	10,793.7	16,538.3	10,715.8	173.0	173.0	81.13	-772.1	5,893.8	505.3	164.5	340.80	1.483	Level 3Level 3
16,600.0	10,794.2	16,638.3	10,716.0	175.9	175.9	81.09	-772.1	5,993.8	505.4	158.8	346.51	1.458	Level 3Level 3
16,700.0	10,794.8	16,738.3	10,716.2	178.8	178.8	81.06	-772.1	6,093.8	505.4	153.2	352.21	1.435	Level 3Level 3
16,800.0	10,795.3	16,838.3	10,716.3	181.7	181.6	81.02	-772.1	6,193.8	505.5	147.5	357.92	1.412	Level 3Level 3
16,900.0	10,795.8	16,938.3	10,716.5	184.6	184.5	80.98	-772.1	6,293.8	505.5	141.9	363.62	1.390	Level 3Level 3
17,000.0	10,796.3	17,038.3	10,716.7	187.5	187.4	80.94	-772.1	6,393.8	505.6	136.2	369.33	1.369	Level 3Level 3
17,100.0	10,796.8	17,138.3	10,716.9	190.4	190.3	80.90	-772.1	6,493.8	505.6	130.6	375.04	1.348	Level 3Level 3
17,200.0	10,797.4	17,238.3	10,717.0	193.3	193.2	80.86	-772.1	6,593.8	505.7	124.9	380.74	1.328	Level 3Level 3
17,300.0	10,797.9	17,338.3	10,717.2	196.2	196.1	80.82	-772.1	6,693.8	505.7	119.3	386.45	1.309	Level 3Level 3
17,400.0	10,798.4	17,438.3	10,717.4	199.1	199.0	80.78	-772.1	6,793.8	505.8	113.6	392.16	1.290	Level 3Level 3
17,500.0	10,798.9	17,538.3	10,717.6	202.0	201.9	80.74	-772.1	6,893.8	505.8	108.0	397.86	1.271	Level 3Level 3
17,600.0	10,799.5	17,638.3	10,717.7	204.9	204.8	80.70	-772.1	6,993.8	505.9	102.3	403.57	1.254	Level 3Level 3
17,700.0	10,800.0	17,738.3	10,717.9	207.8	207.7	80.66	-772.1	7,093.8	506.0	96.7	409.28	1.236	Level 2
17,800.0	10,800.5	17,838.3	10,718.1	210.7	210.6	80.63	-772.1	7,193.8	506.0	91.0	414.98	1.219	Level 2
17,900.0	10,801.0	17,938.3	10,718.3	213.6	213.5	80.59	-772.1	7,293.8	506.1	85.4	420.69	1.203	Level 2
18,000.0	10,801.6	18,038.3	10,718.4	216.5	216.4	80.55	-772.1	7,393.8	506.1	79.7	426.39	1.187	Level 2
18,100.0	10,802.1	18,138.3	10,718.6	219.5	219.3	80.51	-772.1	7,493.8	506.2	74.1	432.10	1.171	Level 2
18,200.0	10,802.6	18,238.3	10,718.8	222.4	222.2	80.47	-772.1	7,593.8	506.2	68.4	437.80	1.156	Level 2
18,300.0	10,803.1	18,338.3	10,719.0	225.3	225.1	80.43	-772.1	7,693.8	506.3	62.8	443.50	1.142	Level 2
18,400.0	10,803.7	18,438.3	10,719.1	228.2	228.0	80.39	-772.1	7,793.8	506.4	57.2	449.21	1.127	Level 2
18,500.0	10,804.2	18,538.3	10,719.3	231.1	231.0	80.35	-772.1	7,893.8	506.4	51.5	454.91	1.113	Level 2
18,600.0	10,804.7	18,638.3	10,719.5	234.0	233.9	80.31	-772.1	7,993.8	506.5	45.9	460.61	1.100	Level 2
18,700.0	10,805.2	18,738.3	10,719.7	236.9	236.8	80.28	-772.1	8,093.8	506.5	40.2	466.31	1.086	Level 2
18,800.0	10,805.7	18,838.3	10,719.8	239.8	239.7	80.24	-772.1	8,193.8	506.6	34.6	472.01	1.073	Level 2
18,900.0	10,806.3	18,938.3	10,720.0	242.8	242.6	80.20	-772.1	8,293.8	506.7	28.9	477.71	1.061	Level 2
19,000.0	10,806.8	19,038.3	10,720.2	245.7	245.5	80.16	-772.1	8,393.7	506.7	23.3	483.41	1.048	Level 2
19,100.0	10,807.3	19,138.3	10,720.4	248.6	248.4	80.12	-772.1	8,493.7	506.8	17.7	489.11	1.036	Level 2
19,200.0	10,807.8	19,238.3	10,720.5	251.5	251.3	80.08	-772.1	8,593.7	506.8	12.0	494.81	1.024	Level 2
19,300.0	10,808.4	19,338.3	10,720.7	254.4	254.2	80.04	-772.1	8,693.7	506.9	6.4	500.50	1.013	Level 2
19,400.0	10,808.9	19,438.3	10,720.9	257.3	257.1	80.00	-772.1	8,793.7	507.0	0.8	506.20	1.002	Level 2
19,500.0	10,809.4	19,538.3	10,721.1	260.2	260.1	79.96	-772.1	8,893.7	507.0	-4.9	511.89	0.990	Level 1
19,600.0	10,809.9	19,638.3	10,721.2	263.2	263.0	79.93	-772.1	8,993.7	507.1	-10.5	517.58	0.980	Level 1
19,700.0	10,810.5	19,738.3	10,721.4	266.1	265.9	79.89	-772.1	9,093.7	507.1	-16.1	523.28	0.969	Level 1
19,800.0	10,811.0	19,838.3	10,721.6	269.0	268.8	79.85	-772.1	9,193.7	507.2	-21.8	528.97	0.959	Level 1
19,900.0	10,811.5	19,938.3	10,721.8	271.9	271.7	79.81	-772.1	9,293.7	507.3	-27.4	534.66	0.949	Level 1
20,000.0	10,812.0	20,038.3	10,721.9	274.8	274.6	79.77	-772.1	9,393.7	507.3	-33.0	540.35	0.939	Level 1
20,100.0	10,812.6	20,138.3	10,722.1	277.8	277.5	79.73	-772.1	9,493.7	507.4	-38.6	546.03	0.929	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 8T
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 8T	Survey Calculation Method:	Minimum Curvature
Well Error:	2.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Kline Federal 5300 31-18 8T	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
20,200.0	10,813.1	20,238.3	10,722.3	280.7	280.4	79.69	-772.1	9,593.7	507.4	-44.3	551.72	0.920	Level 1
20,300.0	10,813.6	20,338.3	10,722.5	283.6	283.4	79.65	-772.1	9,693.7	507.5	-49.9	557.41	0.910	Level 1
20,400.0	10,814.1	20,438.3	10,722.6	286.5	286.3	79.61	-772.1	9,793.7	507.6	-55.5	563.09	0.901	Level 1
20,500.0	10,814.6	20,538.3	10,722.8	289.4	289.2	79.58	-772.1	9,893.7	507.6	-61.1	568.78	0.893	Level 1
20,600.0	10,815.2	20,638.3	10,723.0	292.4	292.1	79.54	-772.1	9,993.7	507.7	-66.8	574.46	0.884	Level 1
20,656.4	10,815.5	20,694.5	10,723.1	294.0	293.8	79.52	-772.1	10,050.0	507.7	-69.9	577.66	0.879	Level 1, ES, SF

Company:	Oasis	Local Co-ordinate Reference:	Well Kline Federal 5300 31-18 8T
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 8T	Survey Calculation Method:	Minimum Curvature
Well Error:	2.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Kline Federal 5300 31-18 8T	Database:	EDM_new
Reference Design:	Design #1	Offset TVD Reference:	Offset Datum

Offset Design 153N-100W-17/18 - Kline Federal 5300 31-18 7T2 - Kline Federal 5300 31-18 7T2 - 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	180.00	-32.4	0.0	32.4				
100.0	100.0	100.0	100.0	2.0	2.0	180.00	-32.4	0.0	32.4	28.4	4.00	8.098	
200.0	200.0	200.0	200.0	2.0	2.0	180.00	-32.4	0.0	32.4	28.4	4.05	8.010	
300.0	300.0	300.0	300.0	2.1	2.1	180.00	-32.4	0.0	32.4	28.3	4.14	7.831	
400.0	400.0	400.0	400.0	2.1	2.1	180.00	-32.4	0.0	32.4	28.1	4.28	7.578	
500.0	500.0	500.0	500.0	2.2	2.2	180.00	-32.4	0.0	32.4	28.0	4.46	7.274	
600.0	600.0	600.0	600.0	2.3	2.3	180.00	-32.4	0.0	32.4	27.7	4.67	6.938	
700.0	700.0	700.0	700.0	2.5	2.5	180.00	-32.4	0.0	32.4	27.5	4.92	6.589	
800.0	800.0	800.0	800.0	2.6	2.6	180.00	-32.4	0.0	32.4	27.2	5.20	6.240	
900.0	900.0	900.0	900.0	2.7	2.7	180.00	-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	180.00	-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	180.00	-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	180.00	-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	180.00	-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	180.00	-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	180.00	-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	180.00	-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	180.00	-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	180.00	-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	180.00	-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	180.00	-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	180.00	-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	180.00	-32.4	0.0	32.4	22.0	10.41	3.115	CC
2,216.7	2,216.7	2,216.7	2,216.7	5.2	5.2	180.00	-32.4	0.0	32.5	22.0	10.48	3.101	
2,300.0	2,300.0	2,300.0	2,300.0	5.4	5.4	180.00	-32.4	0.0	33.2	22.4	10.82	3.069	
2,400.0	2,400.0	2,400.0	2,400.0	5.6	5.6	180.00	-32.4	0.0	34.1	22.9	11.24	3.032	
2,500.0	2,500.0	2,500.0	2,500.0	5.8	5.8	180.00	-32.4	0.0	35.0	23.3	11.66	2.998	
2,600.0	2,600.0	2,600.0	2,600.0	6.0	6.0	180.00	-32.4	0.0	35.8	23.8	12.09	2.965	
2,700.0	2,700.0	2,700.0	2,700.0	6.3	6.3	180.00	-32.4	0.0	36.7	24.2	12.51	2.934	
2,800.0	2,800.0	2,800.0	2,800.0	6.5	6.5	180.00	-32.4	0.0	37.6	24.6	12.94	2.905	
2,900.0	2,900.0	2,900.0	2,900.0	6.7	6.7	180.00	-32.4	0.0	38.5	25.1	13.37	2.877	
3,000.0	3,000.0	3,000.0	3,000.0	6.9	6.9	180.00	-32.4	0.0	39.3	25.5	13.80	2.851	
3,100.0	3,100.0	3,100.0	3,100.0	7.1	7.1	180.00	-32.4	0.0	40.2	26.0	14.23	2.826	
3,200.0	3,200.0	3,200.0	3,200.0	7.3	7.3	180.00	-32.4	0.0	41.1	26.4	14.66	2.802	
3,300.0	3,300.0	3,300.0	3,300.0	7.5	7.5	180.00	-32.4	0.0	41.9	26.9	15.09	2.779	
3,400.0	3,400.0	3,400.0	3,400.0	7.8	7.8	180.00	-32.4	0.0	42.8	27.3	15.53	2.758	
3,500.0	3,500.0	3,500.0	3,500.0	8.0	8.0	180.00	-32.4	0.0	43.7	27.7	15.96	2.737	
3,600.0	3,599.9	3,599.9	3,599.9	8.2	8.2	180.00	-32.4	0.0	44.6	28.2	16.40	2.718	
3,700.0	3,699.9	3,699.9	3,699.9	8.4	8.4	180.00	-32.4	0.0	45.4	28.6	16.83	2.699	
3,800.0	3,799.9	3,799.9	3,799.9	8.6	8.6	180.00	-32.4	0.0	46.3	29.0	17.27	2.681	
3,900.0	3,899.9	3,899.9	3,899.9	8.9	8.9	180.00	-32.4	0.0	47.2	29.5	17.71	2.664	
4,000.0	3,999.9	3,999.9	3,999.9	9.1	9.1	180.00	-32.4	0.0	48.1	29.9	18.15	2.648	
4,100.0	4,099.9	4,099.9	4,099.9	9.3	9.3	180.00	-32.4	0.0	48.9	30.3	18.59	2.633	
4,200.0	4,199.9	4,199.9	4,199.9	9.5	9.5	180.00	-32.4	0.0	49.8	30.8	19.02	2.618	
4,300.0	4,299.9	4,299.9	4,299.9	9.7	9.7	180.00	-32.4	0.0	50.7	31.2	19.46	2.603	
4,400.0	4,399.9	4,399.9	4,399.9	10.0	10.0	180.00	-32.4	0.0	51.5	31.6	19.90	2.590	
4,500.0	4,499.9	4,499.9	4,499.9	10.2	10.2	180.00	-32.4	0.0	52.4	32.1	20.35	2.576	
4,600.0	4,599.9	4,599.9	4,599.9	10.4	10.4	180.00	-32.4	0.0	53.3	32.5	20.79	2.564	
4,700.0	4,699.9	4,699.9	4,699.9	10.6	10.6	180.00	-32.4	0.0	54.2	32.9	21.23	2.552	
4,800.0	4,799.9	4,799.9	4,799.9	10.8	10.8	180.00	-32.4	0.0	55.0	33.4	21.67	2.540	
4,900.0	4,899.9	4,899.9	4,899.9	11.1	11.1	180.00	-32.4	0.0	55.9	33.8	22.11	2.529	
5,000.0	4,999.9	4,999.9	4,999.9	11.3	11.3	180.00	-32.4	0.0	56.8	34.2	22.55	2.518	

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 8T
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 8T	Survey Calculation Method:	Minimum Curvature
Well Error:	2.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Kline Federal 5300 31-18 8T	Database:	EDM_new
Reference Design:	Design #1	Offset TVD Reference:	Offset Datum

Offset Design 153N-100W-17/18 - Kline Federal 5300 31-18 7T2 - Kline Federal 5300 31-18 7T2 - 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
5,100.0	5,099.9	5,099.9	5,099.9	11.5	11.5	180.00	-32.4	0.0	57.7	34.7	23.00	2.507	
5,200.0	5,199.9	5,199.9	5,199.9	11.7	11.7	180.00	-32.4	0.0	58.5	35.1	23.44	2.497	
5,300.0	5,299.9	5,299.9	5,299.9	11.9	11.9	180.00	-32.4	0.0	59.4	35.5	23.88	2.487	
5,400.0	5,399.9	5,399.9	5,399.9	12.2	12.2	180.00	-32.4	0.0	60.3	35.9	24.33	2.478	
5,500.0	5,499.9	5,499.9	5,499.9	12.4	12.4	180.00	-32.4	0.0	61.1	36.4	24.77	2.469	
5,600.0	5,599.9	5,599.9	5,599.9	12.6	12.6	180.00	-32.4	0.0	62.0	36.8	25.21	2.460	
5,700.0	5,699.9	5,699.9	5,699.9	12.8	12.8	180.00	-32.4	0.0	62.9	37.2	25.66	2.451	
5,800.0	5,799.9	5,799.9	5,799.9	13.1	13.0	180.00	-32.4	0.0	63.8	37.7	26.10	2.443	
5,900.0	5,899.9	5,899.9	5,899.9	13.3	13.3	180.00	-32.4	0.0	64.6	38.1	26.55	2.435	
6,000.0	5,999.9	5,999.9	5,999.9	13.5	13.5	180.00	-32.4	0.0	65.5	38.5	26.99	2.427	
6,100.0	6,099.9	6,099.9	6,099.9	13.7	13.7	180.00	-32.4	0.0	66.4	38.9	27.43	2.420	
6,200.0	6,199.8	6,199.8	6,199.8	13.9	13.9	180.00	-32.4	0.0	67.3	39.4	27.88	2.412	
6,300.0	6,299.8	6,299.8	6,299.8	14.2	14.2	180.00	-32.4	0.0	68.1	39.8	28.32	2.405	
6,400.0	6,399.8	6,399.8	6,399.8	14.4	14.4	180.00	-32.4	0.0	69.0	40.2	28.77	2.398	
6,500.0	6,499.8	6,499.8	6,499.8	14.6	14.6	180.00	-32.4	0.0	69.9	40.7	29.22	2.392	
6,600.0	6,599.8	6,599.8	6,599.8	14.8	14.8	180.00	-32.4	0.0	70.7	41.1	29.66	2.385	
6,700.0	6,699.8	6,699.8	6,699.8	15.1	15.1	180.00	-32.4	0.0	71.6	41.5	30.11	2.379	
6,800.0	6,799.8	6,799.8	6,799.8	15.3	15.3	180.00	-32.4	0.0	72.5	41.9	30.55	2.373	
6,900.0	6,899.8	6,899.8	6,899.8	15.5	15.5	180.00	-32.4	0.0	73.4	42.4	31.00	2.367	
7,000.0	6,999.8	6,999.8	6,999.8	15.7	15.7	180.00	-32.4	0.0	74.2	42.8	31.44	2.361	
7,100.0	7,099.8	7,099.8	7,099.8	15.9	15.9	180.00	-32.4	0.0	75.1	43.2	31.89	2.355	
7,200.0	7,199.8	7,199.8	7,199.8	16.2	16.2	180.00	-32.4	0.0	76.0	43.6	32.34	2.350	
7,300.0	7,299.8	7,299.8	7,299.8	16.4	16.4	180.00	-32.4	0.0	76.9	44.1	32.78	2.344	
7,400.0	7,399.8	7,399.8	7,399.8	16.6	16.6	180.00	-32.4	0.0	77.7	44.5	33.23	2.339	
7,500.0	7,499.8	7,499.8	7,499.8	16.8	16.8	180.00	-32.4	0.0	78.6	44.9	33.67	2.334	
7,600.0	7,599.8	7,599.8	7,599.8	17.1	17.1	180.00	-32.4	0.0	79.5	45.4	34.12	2.329	
7,700.0	7,699.8	7,699.8	7,699.8	17.3	17.3	180.00	-32.4	0.0	80.3	45.8	34.57	2.324	
7,800.0	7,799.8	7,799.8	7,799.8	17.5	17.5	180.00	-32.4	0.0	81.2	46.2	35.01	2.320	
7,900.0	7,899.8	7,899.8	7,899.8	17.7	17.7	180.00	-32.4	0.0	82.1	46.6	35.46	2.315	
7,926.7	7,926.4	7,926.4	7,926.4	17.8	17.8	180.00	-32.4	0.0	82.3	46.7	35.58	2.314	
7,943.3	7,943.1	7,943.1	7,943.1	17.8	17.8	180.00	-32.4	0.0	82.4	46.8	35.63	2.312	
8,000.0	7,999.8	7,999.8	7,999.8	17.9	18.0	180.00	-32.4	0.0	82.4	46.5	35.87	2.297	
8,100.0	8,099.8	8,099.8	8,099.8	18.2	18.2	180.00	-32.4	0.0	82.4	46.1	36.32	2.269	
8,200.0	8,199.8	8,199.8	8,199.8	18.4	18.4	180.00	-32.4	0.0	82.4	45.6	36.76	2.241	
8,300.0	8,299.8	8,299.8	8,299.8	18.6	18.6	180.00	-32.4	0.0	82.4	45.2	37.21	2.214	
8,400.0	8,399.8	8,399.8	8,399.8	18.8	18.8	180.00	-32.4	0.0	82.4	44.7	37.66	2.188	
8,500.0	8,499.8	8,499.8	8,499.8	19.1	19.1	180.00	-32.4	0.0	82.4	44.3	38.10	2.162	
8,600.0	8,599.8	8,599.8	8,599.8	19.3	19.3	180.00	-32.4	0.0	82.4	43.8	38.55	2.137	
8,700.0	8,699.8	8,699.8	8,699.8	19.5	19.5	180.00	-32.4	0.0	82.4	43.4	39.00	2.113	
8,800.0	8,799.8	8,799.8	8,799.8	19.7	19.7	180.00	-32.4	0.0	82.4	43.0	39.44	2.089	
8,900.0	8,899.8	8,899.8	8,899.8	19.9	20.0	180.00	-32.4	0.0	82.4	42.5	39.89	2.066	
9,000.0	8,999.8	8,999.8	8,999.8	20.2	20.2	180.00	-32.4	0.0	82.4	42.1	40.34	2.043	
9,100.0	9,099.8	9,099.8	9,099.8	20.4	20.4	180.00	-32.4	0.0	82.4	41.6	40.78	2.020	
9,200.0	9,199.8	9,199.8	9,199.8	20.6	20.6	180.00	-32.4	0.0	82.4	41.2	41.23	1.998	
9,300.0	9,299.8	9,299.8	9,299.8	20.8	20.9	180.00	-32.4	0.0	82.4	40.7	41.68	1.977	
9,400.0	9,399.8	9,399.8	9,399.8	21.1	21.1	180.00	-32.4	0.0	82.4	40.3	42.13	1.956	
9,500.0	9,499.8	9,499.8	9,499.8	21.3	21.3	180.00	-32.4	0.0	82.4	39.8	42.57	1.935	
9,600.0	9,599.8	9,599.8	9,599.8	21.5	21.5	180.00	-32.4	0.0	82.4	39.4	43.02	1.915	
9,700.0	9,699.8	9,699.8	9,699.8	21.7	21.8	180.00	-32.4	0.0	82.4	38.9	43.47	1.896	
9,800.0	9,799.8	9,799.8	9,799.8	22.0	22.0	180.00	-32.4	0.0	82.4	38.5	43.92	1.876	
9,900.0	9,899.8	9,899.8	9,899.8	22.2	22.2	180.00	-32.4	0.0	82.4	38.0	44.36	1.857	
10,000.0	9,999.8	9,999.8	9,999.8	22.4	22.4	180.00	-32.4	0.0	82.4	37.6	44.81	1.839	

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 8T
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 8T	Survey Calculation Method:	Minimum Curvature
Well Error:	2.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Kline Federal 5300 31-18 8T	Database:	EDM_new
Reference Design:	Design #1	Offset TVD Reference:	Offset Datum

Offset Design 153N-100W-17/18 - Kline Federal 5300 31-18 7T2 - Kline Federal 5300 31-18 7T2 - 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
10,100.0	10,099.8	10,099.8	10,099.8	22.6	22.6	180.00	-32.4	0.0	82.4	37.1	45.26	1.821	
10,200.0	10,199.8	10,199.8	10,199.8	22.9	22.9	180.00	-32.4	0.0	82.4	36.7	45.71	1.803	
10,287.8	10,287.6	10,287.6	10,287.6	23.1	23.1	180.00	-32.4	0.0	82.4	36.3	46.10	1.787	
10,300.0	10,299.8	10,299.8	10,299.8	23.1	23.1	70.61	-32.4	0.0	82.3	36.2	46.17	1.783	
10,325.0	10,324.7	10,324.7	10,324.7	23.1	23.2	71.51	-32.4	0.0	81.9	35.7	46.26	1.771	
10,350.0	10,349.6	10,348.5	10,348.5	23.2	23.2	73.12	-32.5	0.1	81.2	34.9	46.35	1.753	
10,375.0	10,374.3	10,371.4	10,371.3	23.2	23.2	74.89	-33.2	1.1	80.8	34.4	46.42	1.740	
10,395.1	10,394.0	10,389.8	10,389.7	23.3	23.3	76.40	-34.1	2.6	80.7	34.2	46.49	1.735	
10,400.0	10,398.8	10,394.4	10,394.2	23.3	23.3	76.78	-34.4	3.0	80.7	34.2	46.51	1.735	
10,425.0	10,422.9	10,417.5	10,417.1	23.3	23.3	78.75	-36.3	5.9	80.9	34.3	46.60	1.737	
10,450.0	10,446.7	10,440.7	10,439.8	23.4	23.4	80.79	-38.8	9.6	81.6	34.9	46.70	1.747	
10,475.0	10,470.0	10,464.0	10,462.4	23.4	23.4	82.87	-41.9	14.3	82.6	35.8	46.81	1.764	
10,500.0	10,492.9	10,487.4	10,484.8	23.5	23.5	84.94	-45.7	20.0	84.0	37.1	46.93	1.790	
10,525.0	10,515.1	10,510.8	10,506.9	23.6	23.5	86.98	-50.0	26.5	85.8	38.7	47.05	1.824	
10,550.0	10,536.8	10,534.4	10,528.7	23.6	23.6	88.96	-55.0	34.0	88.0	40.8	47.17	1.866	
10,575.0	10,557.8	10,558.1	10,550.1	23.7	23.6	90.85	-60.6	42.5	90.6	43.3	47.29	1.916	
10,600.0	10,578.0	10,581.9	10,571.1	23.8	23.7	92.63	-66.8	51.8	93.6	46.2	47.41	1.975	
10,625.0	10,597.4	10,605.8	10,591.6	23.8	23.7	94.29	-73.6	62.1	97.0	49.5	47.53	2.041	
10,650.0	10,616.0	10,629.8	10,611.5	23.9	23.8	95.82	-81.0	73.2	100.8	53.1	47.65	2.115	
10,675.0	10,633.7	10,653.9	10,630.8	24.0	23.9	97.20	-88.9	85.2	104.8	57.1	47.76	2.195	
10,700.0	10,650.5	10,678.1	10,649.5	24.2	24.0	98.44	-97.5	98.1	109.3	61.4	47.88	2.282	
10,725.0	10,666.2	10,702.5	10,667.4	24.3	24.0	99.54	-106.6	111.9	114.0	66.0	48.01	2.374	
10,750.0	10,680.9	10,726.9	10,684.5	24.4	24.1	100.50	-116.2	126.4	119.0	70.8	48.16	2.470	
10,775.0	10,694.5	10,751.5	10,700.8	24.6	24.3	101.32	-126.4	141.7	124.2	75.9	48.32	2.571	
10,800.0	10,707.0	10,776.3	10,716.3	24.7	24.4	102.02	-137.1	157.8	129.7	81.2	48.52	2.674	
10,825.0	10,718.4	10,801.1	10,730.8	24.9	24.5	102.60	-148.3	174.7	135.4	86.7	48.74	2.779	
10,850.0	10,728.6	10,826.1	10,744.2	25.1	24.7	103.06	-159.9	192.2	141.3	92.3	49.00	2.885	
10,875.0	10,737.6	10,851.3	10,756.7	25.4	24.8	103.42	-172.0	210.5	147.4	98.1	49.30	2.990	
10,900.0	10,745.3	10,876.6	10,768.0	25.6	25.0	103.68	-184.5	229.3	153.6	104.0	49.64	3.095	
10,925.0	10,751.8	10,902.1	10,778.2	25.8	25.2	103.86	-197.4	248.8	160.0	110.0	50.03	3.198	
10,950.0	10,757.0	10,927.8	10,787.2	26.1	25.4	103.95	-210.7	268.9	166.5	116.0	50.46	3.299	
10,975.0	10,760.9	10,953.6	10,794.9	26.4	25.6	103.96	-224.3	289.4	173.0	122.1	50.93	3.397	
11,000.0	10,763.6	10,979.7	10,801.3	26.7	25.9	103.91	-238.3	310.5	179.6	128.2	51.45	3.492	
11,025.0	10,764.9	11,005.9	10,806.3	27.0	26.2	103.80	-252.5	331.9	186.3	134.3	52.01	3.582	
11,035.3	10,765.0	11,016.8	10,808.0	27.1	26.3	103.74	-258.5	340.9	189.0	136.8	52.25	3.618	
11,100.0	10,765.4	11,085.8	10,813.0	28.0	27.1	103.91	-296.5	398.2	206.0	152.2	53.79	3.829	
11,200.0	10,765.9	11,190.0	10,813.3	29.6	28.5	102.31	-352.4	486.1	231.6	174.8	56.82	4.076	
11,300.0	10,766.4	11,295.4	10,813.7	31.3	30.2	101.04	-405.7	577.0	257.2	197.1	60.17	4.275	
11,400.0	10,767.0	11,401.8	10,814.1	33.3	32.1	100.00	-456.1	670.8	282.8	219.0	63.81	4.432	
11,500.0	10,767.5	11,509.4	10,814.5	35.3	34.2	99.15	-503.4	767.3	308.2	240.5	67.68	4.553	
11,600.0	10,768.0	11,618.2	10,814.9	37.5	36.4	98.43	-547.6	866.7	333.3	261.6	71.73	4.647	
11,700.0	10,768.6	11,728.1	10,815.3	39.8	38.8	97.81	-588.3	968.8	358.2	282.3	75.93	4.718	
11,800.0	10,769.1	11,839.2	10,815.7	42.1	41.4	97.29	-625.5	1,073.5	382.8	302.5	80.23	4.771	
11,900.0	10,769.6	11,951.6	10,816.1	44.5	44.0	96.83	-659.0	1,180.8	406.9	322.3	84.60	4.810	
12,000.0	10,770.1	12,065.2	10,816.5	46.9	46.7	96.43	-688.5	1,290.5	430.7	341.7	89.02	4.839	
12,010.3	10,770.2	12,077.0	10,816.5	47.1	47.0	96.39	-691.3	1,301.9	433.1	343.7	89.47	4.841	
12,100.0	10,770.7	12,180.4	10,816.9	49.4	49.6	96.05	-713.9	1,402.8	452.7	358.5	94.22	4.805	
12,200.0	10,771.2	12,297.5	10,817.3	51.9	52.5	95.75	-735.2	1,518.0	470.7	371.0	99.67	4.723	
12,300.0	10,771.7	12,416.3	10,817.8	54.4	55.5	95.53	-751.9	1,635.5	484.7	379.4	105.28	4.604	
12,400.0	10,772.2	12,536.2	10,818.2	57.0	58.5	95.37	-763.8	1,754.9	494.6	383.6	111.01	4.455	
12,500.0	10,772.8	12,656.9	10,818.6	59.7	61.6	95.27	-770.7	1,875.4	500.3	383.5	116.83	4.282	
12,600.0	10,773.3	12,775.1	10,819.0	62.3	64.6	95.23	-772.6	1,993.5	501.8	379.2	122.62	4.092	

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 8T
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 8T	Survey Calculation Method:	Minimum Curvature
Well Error:	2.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Kline Federal 5300 31-18 8T	Database:	EDM_new
Reference Design:	Design #1	Offset TVD Reference:	Offset Datum

Offset Design 153N-100W-17/18 - Kline Federal 5300 31-18 7T2 - Kline Federal 5300 31-18 7T2 - 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
12,700.0	10,773.8	12,875.1	10,819.4	65.0	67.1	95.21	-772.6	2,093.5	501.8	373.8	127.99	3.921	
12,800.0	10,774.3	12,975.1	10,819.7	67.7	69.7	95.19	-772.6	2,193.5	501.8	368.4	133.40	3.762	
12,900.0	10,774.9	13,075.1	10,820.1	70.4	72.3	95.17	-772.6	2,293.5	501.8	362.9	138.85	3.614	
13,000.0	10,775.4	13,175.1	10,820.4	73.1	74.9	95.15	-772.6	2,393.5	501.8	357.4	144.32	3.477	
13,100.0	10,775.9	13,275.1	10,820.8	75.9	77.6	95.13	-772.6	2,493.5	501.8	351.9	149.83	3.349	
13,200.0	10,776.4	13,375.1	10,821.1	78.7	80.3	95.11	-772.6	2,593.5	501.7	346.4	155.36	3.230	
13,300.0	10,776.9	13,475.1	10,821.5	81.4	83.0	95.09	-772.6	2,693.5	501.7	340.8	160.91	3.118	
13,400.0	10,777.5	13,575.1	10,821.8	84.2	85.7	95.07	-772.6	2,793.5	501.7	335.2	166.48	3.014	
13,500.0	10,778.0	13,675.1	10,822.2	87.0	88.4	95.05	-772.6	2,893.5	501.7	329.6	172.08	2.916	
13,600.0	10,778.5	13,775.1	10,822.5	89.8	91.1	95.03	-772.6	2,993.5	501.7	324.0	177.68	2.823	
13,700.0	10,779.0	13,875.1	10,822.9	92.6	93.9	95.01	-772.6	3,093.5	501.7	318.4	183.31	2.737	
13,800.0	10,779.6	13,975.1	10,823.2	95.4	96.6	94.99	-772.6	3,193.5	501.7	312.7	188.94	2.655	
13,900.0	10,780.1	14,075.1	10,823.6	98.3	99.4	94.97	-772.6	3,293.5	501.6	307.0	194.59	2.578	
14,000.0	10,780.6	14,175.1	10,823.9	101.1	102.2	94.95	-772.6	3,393.5	501.6	301.4	200.26	2.505	
14,100.0	10,781.1	14,275.1	10,824.3	103.9	105.0	94.93	-772.6	3,493.5	501.6	295.7	205.93	2.436	
14,200.0	10,781.7	14,375.1	10,824.6	106.8	107.8	94.91	-772.6	3,593.5	501.6	290.0	211.61	2.370	
14,300.0	10,782.2	14,475.1	10,825.0	109.6	110.6	94.89	-772.6	3,693.5	501.6	284.3	217.30	2.308	
14,400.0	10,782.7	14,575.1	10,825.3	112.5	113.4	94.87	-772.6	3,793.5	501.6	278.6	223.00	2.249	
14,500.0	10,783.2	14,675.1	10,825.7	115.3	116.2	94.85	-772.6	3,893.5	501.5	272.8	228.71	2.193	
14,600.0	10,783.8	14,775.1	10,826.0	118.2	119.0	94.83	-772.6	3,993.5	501.5	267.1	234.43	2.139	
14,700.0	10,784.3	14,875.1	10,826.4	121.1	121.8	94.81	-772.6	4,093.5	501.5	261.4	240.15	2.088	
14,800.0	10,784.8	14,975.1	10,826.7	123.9	124.6	94.79	-772.6	4,193.5	501.5	255.6	245.88	2.040	
14,900.0	10,785.3	15,075.1	10,827.1	126.8	127.5	94.77	-772.6	4,293.5	501.5	249.9	251.61	1.993	
15,000.0	10,785.8	15,175.1	10,827.4	129.7	130.3	94.75	-772.6	4,393.5	501.5	244.1	257.35	1.949	
15,100.0	10,786.4	15,275.1	10,827.8	132.5	133.2	94.73	-772.6	4,493.5	501.5	238.4	263.10	1.906	
15,200.0	10,786.9	15,375.1	10,828.1	135.4	136.0	94.71	-772.6	4,593.5	501.4	232.6	268.84	1.865	
15,300.0	10,787.4	15,475.1	10,828.5	138.3	138.9	94.70	-772.6	4,693.5	501.4	226.8	274.60	1.826	
15,400.0	10,787.9	15,575.1	10,828.8	141.2	141.7	94.68	-772.6	4,793.5	501.4	221.1	280.36	1.788	
15,500.0	10,788.5	15,675.1	10,829.2	144.0	144.6	94.66	-772.6	4,893.5	501.4	215.3	286.12	1.752	
15,600.0	10,789.0	15,775.1	10,829.5	146.9	147.4	94.64	-772.6	4,993.5	501.4	209.5	291.89	1.718	
15,700.0	10,789.5	15,875.1	10,829.9	149.8	150.3	94.62	-772.6	5,093.5	501.4	203.7	297.66	1.684	
15,800.0	10,790.0	15,975.1	10,830.2	152.7	153.1	94.60	-772.6	5,193.5	501.4	197.9	303.43	1.652	
15,900.0	10,790.6	16,075.1	10,830.6	155.6	156.0	94.58	-772.6	5,293.5	501.3	192.1	309.21	1.621	
16,000.0	10,791.1	16,175.1	10,830.9	158.5	158.9	94.56	-772.6	5,393.5	501.3	186.3	314.99	1.592	
16,100.0	10,791.6	16,275.1	10,831.3	161.4	161.8	94.54	-772.6	5,493.5	501.3	180.5	320.77	1.563	
16,200.0	10,792.1	16,375.1	10,831.6	164.3	164.6	94.52	-772.6	5,593.5	501.3	174.7	326.56	1.535	
16,300.0	10,792.7	16,475.1	10,832.0	167.2	167.5	94.50	-772.6	5,693.5	501.3	168.9	332.35	1.508	
16,400.0	10,793.2	16,575.1	10,832.3	170.1	170.4	94.48	-772.6	5,793.5	501.3	163.1	338.14	1.482	Level 3Level 3
16,500.0	10,793.7	16,675.1	10,832.7	173.0	173.3	94.46	-772.6	5,893.5	501.3	157.3	343.93	1.457	Level 3Level 3
16,600.0	10,794.2	16,775.1	10,833.0	175.9	176.1	94.44	-772.6	5,993.5	501.2	151.5	349.73	1.433	Level 3Level 3
16,700.0	10,794.8	16,875.1	10,833.4	178.8	179.0	94.42	-772.6	6,093.5	501.2	145.7	355.52	1.410	Level 3Level 3
16,800.0	10,795.3	16,975.1	10,833.7	181.7	181.9	94.40	-772.6	6,193.5	501.2	139.9	361.32	1.387	Level 3Level 3
16,900.0	10,795.8	17,075.1	10,834.0	184.6	184.8	94.38	-772.6	6,293.5	501.2	134.1	367.13	1.365	Level 3Level 3
17,000.0	10,796.3	17,175.1	10,834.4	187.5	187.7	94.36	-772.6	6,393.5	501.2	128.3	372.93	1.344	Level 3Level 3
17,100.0	10,796.8	17,275.1	10,834.7	190.4	190.6	94.34	-772.6	6,493.5	501.2	122.4	378.74	1.323	Level 3Level 3
17,200.0	10,797.4	17,375.1	10,835.1	193.3	193.5	94.32	-772.6	6,593.5	501.2	116.6	384.54	1.303	Level 3Level 3
17,300.0	10,797.9	17,475.1	10,835.4	196.2	196.4	94.30	-772.6	6,693.5	501.2	110.8	390.35	1.284	Level 3Level 3
17,400.0	10,798.4	17,575.1	10,835.8	199.1	199.2	94.28	-772.6	6,793.5	501.1	105.0	396.16	1.265	Level 3Level 3
17,500.0	10,798.9	17,675.1	10,836.1	202.0	202.1	94.26	-772.6	6,893.5	501.1	99.2	401.98	1.247	Level 2
17,600.0	10,799.5	17,775.1	10,836.5	204.9	205.0	94.24	-772.6	6,993.5	501.1	93.3	407.79	1.229	Level 2
17,700.0	10,800.0	17,875.1	10,836.8	207.8	207.9	94.22	-772.6	7,093.5	501.1	87.5	413.61	1.212	Level 2
17,800.0	10,800.5	17,975.1	10,837.2	210.7	210.8	94.20	-772.6	7,193.5	501.1	81.7	419.42	1.195	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 8T
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 8T	Survey Calculation Method:	Minimum Curvature
Well Error:	2.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Kline Federal 5300 31-18 8T	Database:	EDM_new
Reference Design:	Design #1	Offset TVD Reference:	Offset Datum

Offset Design 153N-100W-17/18 - Kline Federal 5300 31-18 7T2 - Kline Federal 5300 31-18 7T2 - 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
17,900.0	10,801.0	18,075.1	10,837.5	213.6	213.7	94.18	-772.6	7,293.5	501.1	75.8	425.24	1.178	Level 2
18,000.0	10,801.6	18,175.1	10,837.9	216.5	216.6	94.16	-772.6	7,393.5	501.1	70.0	431.06	1.162	Level 2
18,100.0	10,802.1	18,275.1	10,838.2	219.5	219.5	94.14	-772.6	7,493.5	501.1	64.2	436.88	1.147	Level 2
18,200.0	10,802.6	18,375.1	10,838.6	222.4	222.4	94.12	-772.6	7,593.5	501.0	58.3	442.71	1.132	Level 2
18,300.0	10,803.1	18,475.1	10,838.9	225.3	225.3	94.10	-772.6	7,693.5	501.0	52.5	448.53	1.117	Level 2
18,400.0	10,803.7	18,575.1	10,839.3	228.2	228.2	94.08	-772.6	7,793.5	501.0	46.7	454.35	1.103	Level 2
18,500.0	10,804.2	18,675.1	10,839.6	231.1	231.1	94.06	-772.6	7,893.5	501.0	40.8	460.18	1.089	Level 2
18,600.0	10,804.7	18,775.1	10,840.0	234.0	234.0	94.04	-772.6	7,993.5	501.0	35.0	466.01	1.075	Level 2
18,700.0	10,805.2	18,875.1	10,840.3	236.9	236.9	94.02	-772.6	8,093.5	501.0	29.1	471.83	1.062	Level 2
18,800.0	10,805.7	18,975.1	10,840.7	239.8	239.8	94.00	-772.6	8,193.5	501.0	23.3	477.66	1.049	Level 2
18,900.0	10,806.3	19,075.1	10,841.0	242.8	242.7	93.98	-772.6	8,293.5	501.0	17.5	483.49	1.036	Level 2
19,000.0	10,806.8	19,175.1	10,841.4	245.7	245.6	93.96	-772.6	8,393.5	500.9	11.6	489.32	1.024	Level 2
19,100.0	10,807.3	19,275.1	10,841.7	248.6	248.5	93.94	-772.6	8,493.5	500.9	5.8	495.15	1.012	Level 2
19,200.0	10,807.8	19,375.1	10,842.1	251.5	251.5	93.92	-772.6	8,593.5	500.9	-0.1	500.99	1.000	Level 1
19,300.0	10,808.4	19,475.1	10,842.4	254.4	254.4	93.90	-772.6	8,693.5	500.9	-5.9	506.82	0.988	Level 1
19,400.0	10,808.9	19,575.1	10,842.8	257.3	257.3	93.88	-772.6	8,793.5	500.9	-11.8	512.65	0.977	Level 1
19,500.0	10,809.4	19,675.1	10,843.1	260.2	260.2	93.86	-772.6	8,893.5	500.9	-17.6	518.49	0.966	Level 1
19,600.0	10,809.9	19,775.1	10,843.5	263.2	263.1	93.84	-772.6	8,993.5	500.9	-23.5	524.33	0.955	Level 1
19,700.0	10,810.5	19,875.1	10,843.8	266.1	266.0	93.82	-772.6	9,093.5	500.9	-29.3	530.16	0.945	Level 1
19,800.0	10,811.0	19,975.1	10,844.2	269.0	268.9	93.80	-772.6	9,193.5	500.8	-35.2	536.00	0.934	Level 1
19,900.0	10,811.5	20,075.1	10,844.5	271.9	271.8	93.78	-772.6	9,293.5	500.8	-41.0	541.84	0.924	Level 1
20,000.0	10,812.0	20,175.1	10,844.9	274.8	274.7	93.76	-772.6	9,393.5	500.8	-46.9	547.68	0.914	Level 1
20,100.0	10,812.6	20,275.1	10,845.2	277.8	277.6	93.74	-772.6	9,493.5	500.8	-52.7	553.52	0.905	Level 1
20,200.0	10,813.1	20,375.1	10,845.6	280.7	280.6	93.72	-772.6	9,593.5	500.8	-58.6	559.36	0.895	Level 1
20,300.0	10,813.6	20,475.1	10,845.9	283.6	283.5	93.70	-772.6	9,693.5	500.8	-64.4	565.20	0.886	Level 1
20,400.0	10,814.1	20,575.1	10,846.3	286.5	286.4	93.68	-772.6	9,793.5	500.8	-70.3	571.04	0.877	Level 1
20,500.0	10,814.6	20,675.1	10,846.6	289.4	289.3	93.66	-772.6	9,893.5	500.8	-76.1	576.88	0.868	Level 1
20,600.0	10,815.2	20,775.1	10,847.0	292.4	292.2	93.64	-772.6	9,993.5	500.8	-82.0	582.72	0.859	Level 1
20,656.4	10,815.5	20,831.5	10,847.2	294.0	293.8	93.63	-772.6	10,049.9	500.8	-85.3	586.02	0.854	Level 1, ES, SF

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 8T
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 8T	Survey Calculation Method:	Minimum Curvature
Well Error:	2.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Kline Federal 5300 31-18 8T	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 8T
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

Federal 5300 31-18 6B, Design #1 V0 — Kline Federal 5300 31-18 7T2, Kline Federal 5300 31-18 7T2, Design #1 V0

Company:	Oasis	Local Co-ordinate Reference:	Well Kline Federal 5300 31-18 8T
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 8T	Survey Calculation Method:	Minimum Curvature
Well Error:	2.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Kline Federal 5300 31-18 8T	Database:	EDM_new
Reference Design:	Design #1	Offset TVD Reference:	Offset Datum

Reference Depths are relative to WELL @ 2033.0usft (Original Well Ele Coordinates are relative to: Kline Federal 5300 31-18 8T
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

Federal 5300 31-18 6B, Design #1 V0 — Kline Federal 5300 31-18 7T2, Kline Federal 5300 31-18 7T2, Design #1 V0

Oasis

Indian Hills
153N-100W-17/18
Kline Federal 5300 31-18 8T

Kline Federal 5300 31-18 8T

Plan: Design #1

Standard Planning Report

18 July, 2014

Database:	EDM_new	Local Co-ordinate Reference:	Well Kline Federal 5300 31-18 8T
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 8T	Survey Calculation Method:	Minimum Curvature
Wellbore:	Kline Federal 5300 31-18 8T		
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 8T

Well Position	**+N/-S**	-1,744.9 usft	**Northing:**	407,221.73 usft	**Latitude:**	48° 4' 28.160 N
	+E/-W	-67.9 usft	**Easting:**	1,210,091.03 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 8T

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	
2,200.0	0.00	0.00	2,200.0	0.0	0.0	0.00	0.00	0.00	0.00	
2,216.7	0.50	0.00	2,216.7	0.1	0.0	3.00	3.00	0.00	0.00	
7,926.7	0.50	0.00	7,926.4	49.9	0.0	0.00	0.00	0.00	0.00	
7,943.3	0.00	0.00	7,943.1	50.0	0.0	3.00	-3.00	0.00	180.00	
10,287.8	0.00	0.00	10,287.6	50.0	0.0	0.00	0.00	0.00	0.00	
11,035.3	89.70	109.50	10,765.0	-108.6	447.7	12.00	12.00	0.00	109.50	
12,010.3	89.70	90.00	10,770.2	-272.9	1,404.0	2.00	0.00	-2.00	-90.05	
20,656.4	89.70	90.00	10,815.5	-272.9	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 8T
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 8T	Survey Calculation Method:	Minimum Curvature
Wellbore:	Kline Federal 5300 31-18 8T		
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
2,216.7	0.50	0.00	2,216.7	0.1	0.0	0.0	3.00	3.00	0.00
2,300.0	0.50	0.00	2,300.0	0.8	0.0	0.0	0.00	0.00	0.00
2,400.0	0.50	0.00	2,400.0	1.7	0.0	0.0	0.00	0.00	0.00
2,500.0	0.50	0.00	2,500.0	2.5	0.0	0.0	0.00	0.00	0.00
2,600.0	0.50	0.00	2,600.0	3.4	0.0	0.0	0.00	0.00	0.00
2,700.0	0.50	0.00	2,700.0	4.3	0.0	0.0	0.00	0.00	0.00
2,800.0	0.50	0.00	2,800.0	5.2	0.0	0.0	0.00	0.00	0.00
2,900.0	0.50	0.00	2,900.0	6.0	0.0	0.0	0.00	0.00	0.00
3,000.0	0.50	0.00	3,000.0	6.9	0.0	0.0	0.00	0.00	0.00
3,100.0	0.50	0.00	3,100.0	7.8	0.0	0.0	0.00	0.00	0.00
3,200.0	0.50	0.00	3,200.0	8.7	0.0	0.0	0.00	0.00	0.00
3,300.0	0.50	0.00	3,300.0	9.5	0.0	0.0	0.00	0.00	0.00
3,400.0	0.50	0.00	3,400.0	10.4	0.0	0.0	0.00	0.00	0.00
3,500.0	0.50	0.00	3,500.0	11.3	0.0	0.0	0.00	0.00	0.00
3,600.0	0.50	0.00	3,599.9	12.1	0.0	0.0	0.00	0.00	0.00
3,700.0	0.50	0.00	3,699.9	13.0	0.0	0.0	0.00	0.00	0.00
3,800.0	0.50	0.00	3,799.9	13.9	0.0	0.0	0.00	0.00	0.00
3,900.0	0.50	0.00	3,899.9	14.8	0.0	0.0	0.00	0.00	0.00
4,000.0	0.50	0.00	3,999.9	15.6	0.0	0.0	0.00	0.00	0.00
4,100.0	0.50	0.00	4,099.9	16.5	0.0	0.0	0.00	0.00	0.00
4,200.0	0.50	0.00	4,199.9	17.4	0.0	0.0	0.00	0.00	0.00
4,300.0	0.50	0.00	4,299.9	18.3	0.0	0.0	0.00	0.00	0.00
4,400.0	0.50	0.00	4,399.9	19.1	0.0	0.0	0.00	0.00	0.00
4,500.0	0.50	0.00	4,499.9	20.0	0.0	0.0	0.00	0.00	0.00
4,570.1	0.50	0.00	4,570.0	20.6	0.0	0.0	0.00	0.00	0.00
Greenhorn									

Database:	EDM_new	Local Co-ordinate Reference:	Well Kline Federal 5300 31-18 8T
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 8T	Survey Calculation Method:	Minimum Curvature
Wellbore:	Kline Federal 5300 31-18 8T		
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)
4,600.0	0.50	0.00	4,599.9	20.9	0.0	0.0	0.00	0.00	0.00
4,700.0	0.50	0.00	4,699.9	21.7	0.0	0.0	0.00	0.00	0.00
4,800.0	0.50	0.00	4,799.9	22.6	0.0	0.0	0.00	0.00	0.00
4,900.0	0.50	0.00	4,899.9	23.5	0.0	0.0	0.00	0.00	0.00
4,976.1	0.50	0.00	4,976.0	24.2	0.0	0.0	0.00	0.00	0.00
Mowry									
5,000.0	0.50	0.00	4,999.9	24.4	0.0	0.0	0.00	0.00	0.00
5,100.0	0.50	0.00	5,099.9	25.2	0.0	0.0	0.00	0.00	0.00
5,200.0	0.50	0.00	5,199.9	26.1	0.0	0.0	0.00	0.00	0.00
5,300.0	0.50	0.00	5,299.9	27.0	0.0	0.0	0.00	0.00	0.00
5,400.0	0.50	0.00	5,399.9	27.9	0.0	0.0	0.00	0.00	0.00
5,403.1	0.50	0.00	5,403.0	27.9	0.0	0.0	0.00	0.00	0.00
Dakota									
5,500.0	0.50	0.00	5,499.9	28.7	0.0	0.0	0.00	0.00	0.00
5,600.0	0.50	0.00	5,599.9	29.6	0.0	0.0	0.00	0.00	0.00
5,700.0	0.50	0.00	5,699.9	30.5	0.0	0.0	0.00	0.00	0.00
5,800.0	0.50	0.00	5,799.9	31.3	0.0	0.0	0.00	0.00	0.00
5,900.0	0.50	0.00	5,899.9	32.2	0.0	0.0	0.00	0.00	0.00
6,000.0	0.50	0.00	5,999.9	33.1	0.0	0.0	0.00	0.00	0.00
6,100.0	0.50	0.00	6,099.9	34.0	0.0	0.0	0.00	0.00	0.00
6,101.1	0.50	0.00	6,101.0	34.0	0.0	0.0	0.00	0.00	0.00
9-5/8" Dakota String									
6,200.0	0.50	0.00	6,199.8	34.8	0.0	0.0	0.00	0.00	0.00
6,300.0	0.50	0.00	6,299.8	35.7	0.0	0.0	0.00	0.00	0.00
6,400.0	0.50	0.00	6,399.8	36.6	0.0	0.0	0.00	0.00	0.00
6,402.2	0.50	0.00	6,402.0	36.6	0.0	0.0	0.00	0.00	0.00
Rierdon									
6,500.0	0.50	0.00	6,499.8	37.5	0.0	0.0	0.00	0.00	0.00
6,600.0	0.50	0.00	6,599.8	38.3	0.0	0.0	0.00	0.00	0.00
6,700.0	0.50	0.00	6,699.8	39.2	0.0	0.0	0.00	0.00	0.00
6,740.2	0.50	0.00	6,740.0	39.5	0.0	0.0	0.00	0.00	0.00
Dunham Salt									
6,800.0	0.50	0.00	6,799.8	40.1	0.0	0.0	0.00	0.00	0.00
6,851.2	0.50	0.00	6,851.0	40.5	0.0	0.0	0.00	0.00	0.00
Dunham Salt Base									
6,900.0	0.50	0.00	6,899.8	40.9	0.0	0.0	0.00	0.00	0.00
6,948.2	0.50	0.00	6,948.0	41.4	0.0	0.0	0.00	0.00	0.00
Spearfish									
7,000.0	0.50	0.00	6,999.8	41.8	0.0	0.0	0.00	0.00	0.00
7,100.0	0.50	0.00	7,099.8	42.7	0.0	0.0	0.00	0.00	0.00
7,200.0	0.50	0.00	7,199.8	43.6	0.0	0.0	0.00	0.00	0.00
7,203.2	0.50	0.00	7,203.0	43.6	0.0	0.0	0.00	0.00	0.00
Pine Salt									
7,251.2	0.50	0.00	7,251.0	44.0	0.0	0.0	0.00	0.00	0.00
Pine Salt Base									
7,296.2	0.50	0.00	7,296.0	44.4	0.0	0.0	0.00	0.00	0.00
Opeche Salt									
7,300.0	0.50	0.00	7,299.8	44.4	0.0	0.0	0.00	0.00	0.00
7,326.2	0.50	0.00	7,326.0	44.7	0.0	0.0	0.00	0.00	0.00
Opeche Salt Base									
7,400.0	0.50	0.00	7,399.8	45.3	0.0	0.0	0.00	0.00	0.00
7,500.0	0.50	0.00	7,499.8	46.2	0.0	0.0	0.00	0.00	0.00
7,528.2	0.50	0.00	7,528.0	46.4	0.0	0.0	0.00	0.00	0.00

Database:	EDM_new	Local Co-ordinate Reference:	Well Kline Federal 5300 31-18 8T
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 8T	Survey Calculation Method:	Minimum Curvature
Wellbore:	Kline Federal 5300 31-18 8T		
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	0.50	0.00	7,599.8	47.1	0.0	0.0	0.00	0.00	0.00
7,608.2	0.50	0.00	7,608.0	47.1	0.0	0.0	0.00	0.00	0.00
Amsden									
7,700.0	0.50	0.00	7,699.8	47.9	0.0	0.0	0.00	0.00	0.00
7,776.2	0.50	0.00	7,776.0	48.6	0.0	0.0	0.00	0.00	0.00
Tyler									
7,800.0	0.50	0.00	7,799.8	48.8	0.0	0.0	0.00	0.00	0.00
7,900.0	0.50	0.00	7,899.8	49.7	0.0	0.0	0.00	0.00	0.00
7,926.7	0.50	0.00	7,926.4	49.9	0.0	0.0	0.00	0.00	0.00
7,943.3	0.00	0.00	7,943.1	50.0	0.0	0.0	3.00	-3.00	0.00
7,967.2	0.00	0.00	7,967.0	50.0	0.0	0.0	0.00	0.00	0.00
Otter (Base of Minnelusa Gp.)									
8,000.0	0.00	0.00	7,999.8	50.0	0.0	0.0	0.00	0.00	0.00
8,100.0	0.00	0.00	8,099.8	50.0	0.0	0.0	0.00	0.00	0.00
8,200.0	0.00	0.00	8,199.8	50.0	0.0	0.0	0.00	0.00	0.00
8,300.0	0.00	0.00	8,299.8	50.0	0.0	0.0	0.00	0.00	0.00
8,322.2	0.00	0.00	8,322.0	50.0	0.0	0.0	0.00	0.00	0.00
Kibbey Lime									
8,400.0	0.00	0.00	8,399.8	50.0	0.0	0.0	0.00	0.00	0.00
8,472.2	0.00	0.00	8,472.0	50.0	0.0	0.0	0.00	0.00	0.00
Charles Salt									
8,500.0	0.00	0.00	8,499.8	50.0	0.0	0.0	0.00	0.00	0.00
8,600.0	0.00	0.00	8,599.8	50.0	0.0	0.0	0.00	0.00	0.00
8,700.0	0.00	0.00	8,699.8	50.0	0.0	0.0	0.00	0.00	0.00
8,800.0	0.00	0.00	8,799.8	50.0	0.0	0.0	0.00	0.00	0.00
8,900.0	0.00	0.00	8,899.8	50.0	0.0	0.0	0.00	0.00	0.00
9,000.0	0.00	0.00	8,999.8	50.0	0.0	0.0	0.00	0.00	0.00
9,096.2	0.00	0.00	9,096.0	50.0	0.0	0.0	0.00	0.00	0.00
UB									
9,100.0	0.00	0.00	9,099.8	50.0	0.0	0.0	0.00	0.00	0.00
9,171.2	0.00	0.00	9,171.0	50.0	0.0	0.0	0.00	0.00	0.00
Base Last Salt									
9,200.0	0.00	0.00	9,199.8	50.0	0.0	0.0	0.00	0.00	0.00
9,219.2	0.00	0.00	9,219.0	50.0	0.0	0.0	0.00	0.00	0.00
Ratcliffe									
9,300.0	0.00	0.00	9,299.8	50.0	0.0	0.0	0.00	0.00	0.00
9,395.2	0.00	0.00	9,395.0	50.0	0.0	0.0	0.00	0.00	0.00
Mission Canyon									
9,400.0	0.00	0.00	9,399.8	50.0	0.0	0.0	0.00	0.00	0.00
9,500.0	0.00	0.00	9,499.8	50.0	0.0	0.0	0.00	0.00	0.00
9,600.0	0.00	0.00	9,599.8	50.0	0.0	0.0	0.00	0.00	0.00
9,700.0	0.00	0.00	9,699.8	50.0	0.0	0.0	0.00	0.00	0.00
9,800.0	0.00	0.00	9,799.8	50.0	0.0	0.0	0.00	0.00	0.00
9,900.0	0.00	0.00	9,899.8	50.0	0.0	0.0	0.00	0.00	0.00
9,957.2	0.00	0.00	9,957.0	50.0	0.0	0.0	0.00	0.00	0.00
Lodgepole									
10,000.0	0.00	0.00	9,999.8	50.0	0.0	0.0	0.00	0.00	0.00
10,100.0	0.00	0.00	10,099.8	50.0	0.0	0.0	0.00	0.00	0.00
10,163.2	0.00	0.00	10,163.0	50.0	0.0	0.0	0.00	0.00	0.00
Lodgepole Fracture Zone									
10,200.0	0.00	0.00	10,199.8	50.0	0.0	0.0	0.00	0.00	0.00

Database:	EDM_new	Local Co-ordinate Reference:	Well Kline Federal 5300 31-18 8T
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 8T	Survey Calculation Method:	Minimum Curvature
Wellbore:	Kline Federal 5300 31-18 8T		
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)
10,287.8	0.00	0.00	10,287.6	50.0	0.0	0.0	0.00	0.00	0.00
KOP Build 12°/100'									
10,300.0	1.46	109.50	10,299.8	49.9	0.1	0.1	12.00	12.00	0.00
10,400.0	13.46	109.50	10,398.8	45.6	12.4	12.4	12.00	12.00	0.00
10,500.0	25.46	109.50	10,492.9	34.5	43.7	43.7	12.00	12.00	0.00
10,600.0	37.46	109.50	10,578.0	17.1	92.8	92.8	12.00	12.00	0.00
10,700.0	49.46	109.50	10,650.5	-5.8	157.6	157.6	12.00	12.00	0.00
10,703.9	49.94	109.50	10,653.0	-6.8	160.4	160.4	12.00	12.00	0.00
False Bakken									
10,719.8	51.84	109.50	10,663.0	-10.9	172.0	172.0	12.00	12.00	0.00
Upper Bakken									
10,743.2	54.65	109.50	10,677.0	-17.2	189.7	189.7	12.00	12.00	0.00
Middle Bakken									
10,800.0	61.46	109.50	10,707.0	-33.3	235.1	235.1	12.00	12.00	0.00
10,833.5	65.48	109.50	10,722.0	-43.3	263.3	263.3	12.00	12.00	0.00
Lower Bakken									
10,870.4	69.91	109.50	10,736.0	-54.7	295.5	295.5	12.00	12.00	0.00
Pronghorn									
10,900.0	73.46	109.50	10,745.3	-64.0	322.0	322.0	12.00	12.00	0.00
10,909.8	74.64	109.50	10,748.0	-67.2	330.9	330.9	12.00	12.00	0.00
Three Forks									
10,968.3	81.66	109.50	10,760.0	-86.3	384.8	384.8	12.00	12.00	0.00
TF Target Top									
11,000.0	85.46	109.50	10,763.6	-96.8	414.5	414.5	12.00	12.00	0.00
11,035.3	89.70	109.50	10,765.0	-108.6	447.7	447.7	12.00	12.00	0.00
EOC									
11,036.0	89.70	109.49	10,765.0	-108.8	448.4	448.4	2.00	0.00	-2.00
7" Intermediate									
11,100.0	89.70	108.21	10,765.4	-129.5	508.9	508.9	2.00	0.00	-2.00
11,200.0	89.70	106.21	10,765.9	-159.1	604.5	604.5	2.00	0.00	-2.00
11,300.0	89.70	104.21	10,766.4	-185.3	701.0	701.0	2.00	0.00	-2.00
11,400.0	89.70	102.21	10,767.0	-208.1	798.3	798.3	2.00	0.00	-2.00
11,500.0	89.70	100.21	10,767.5	-227.6	896.4	896.4	2.00	0.00	-2.00
11,600.0	89.70	98.21	10,768.0	-243.6	995.1	995.1	2.00	0.00	-2.00
11,700.0	89.70	96.21	10,768.6	-256.1	1,094.3	1,094.3	2.00	0.00	-2.00
11,800.0	89.70	94.21	10,769.1	-265.2	1,193.9	1,193.9	2.00	0.00	-2.00
11,900.0	89.70	92.21	10,769.6	-270.8	1,293.7	1,293.7	2.00	0.00	-2.00
11,973.0	89.70	90.75	10,770.0	-272.6	1,366.7	1,366.7	2.00	0.00	-2.00
TF Target Base									
12,000.0	89.70	90.21	10,770.1	-272.9	1,393.7	1,393.7	2.00	0.00	-2.00
12,010.3	89.70	90.00	10,770.2	-272.9	1,404.0	1,404.0	2.00	0.00	-2.00
12,100.0	89.70	90.00	10,770.7	-272.9	1,493.7	1,493.7	0.00	0.00	0.00
12,164.0	89.70	90.00	10,771.0	-272.9	1,557.7	1,557.7	0.00	0.00	0.00
Claystone									
12,200.0	89.70	90.00	10,771.2	-272.9	1,593.7	1,593.7	0.00	0.00	0.00
12,300.0	89.70	90.00	10,771.7	-272.9	1,693.7	1,693.7	0.00	0.00	0.00
12,400.0	89.70	90.00	10,772.2	-272.9	1,793.7	1,793.7	0.00	0.00	0.00
12,500.0	89.70	90.00	10,772.8	-272.9	1,893.7	1,893.7	0.00	0.00	0.00
12,600.0	89.70	90.00	10,773.3	-272.9	1,993.7	1,993.7	0.00	0.00	0.00
12,700.0	89.70	90.00	10,773.8	-272.9	2,093.7	2,093.7	0.00	0.00	0.00
12,800.0	89.70	90.00	10,774.3	-272.9	2,193.7	2,193.7	0.00	0.00	0.00
12,900.0	89.70	90.00	10,774.9	-272.9	2,293.7	2,293.7	0.00	0.00	0.00

Database:	EDM_new	Local Co-ordinate Reference:	Well Kline Federal 5300 31-18 8T
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 8T	Survey Calculation Method:	Minimum Curvature
Wellbore:	Kline Federal 5300 31-18 8T		
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)
13,000.0	89.70	90.00	10,775.4	-272.9	2,393.7	2,393.7	0.00	0.00	0.00
13,100.0	89.70	90.00	10,775.9	-272.9	2,493.7	2,493.7	0.00	0.00	0.00
13,200.0	89.70	90.00	10,776.4	-272.9	2,593.7	2,593.7	0.00	0.00	0.00
13,300.0	89.70	90.00	10,776.9	-272.9	2,693.7	2,693.7	0.00	0.00	0.00
13,400.0	89.70	90.00	10,777.5	-272.9	2,793.7	2,793.7	0.00	0.00	0.00
13,500.0	89.70	90.00	10,778.0	-272.9	2,893.7	2,893.7	0.00	0.00	0.00
13,600.0	89.70	90.00	10,778.5	-272.9	2,993.7	2,993.7	0.00	0.00	0.00
13,700.0	89.70	90.00	10,779.0	-272.9	3,093.7	3,093.7	0.00	0.00	0.00
13,800.0	89.70	90.00	10,779.6	-272.9	3,193.7	3,193.7	0.00	0.00	0.00
13,900.0	89.70	90.00	10,780.1	-272.9	3,293.7	3,293.7	0.00	0.00	0.00
14,000.0	89.70	90.00	10,780.6	-272.9	3,393.7	3,393.7	0.00	0.00	0.00
14,100.0	89.70	90.00	10,781.1	-272.9	3,493.7	3,493.7	0.00	0.00	0.00
14,200.0	89.70	90.00	10,781.7	-272.9	3,593.7	3,593.7	0.00	0.00	0.00
14,300.0	89.70	90.00	10,782.2	-272.9	3,693.7	3,693.7	0.00	0.00	0.00
14,400.0	89.70	90.00	10,782.7	-272.9	3,793.7	3,793.7	0.00	0.00	0.00
14,500.0	89.70	90.00	10,783.2	-272.9	3,893.7	3,893.7	0.00	0.00	0.00
14,600.0	89.70	90.00	10,783.8	-272.9	3,993.7	3,993.7	0.00	0.00	0.00
14,700.0	89.70	90.00	10,784.3	-272.9	4,093.7	4,093.7	0.00	0.00	0.00
14,800.0	89.70	90.00	10,784.8	-272.9	4,193.7	4,193.7	0.00	0.00	0.00
14,900.0	89.70	90.00	10,785.3	-272.9	4,293.7	4,293.7	0.00	0.00	0.00
15,000.0	89.70	90.00	10,785.8	-272.9	4,393.7	4,393.7	0.00	0.00	0.00
15,100.0	89.70	90.00	10,786.4	-272.9	4,493.7	4,493.7	0.00	0.00	0.00
15,200.0	89.70	90.00	10,786.9	-272.9	4,593.7	4,593.7	0.00	0.00	0.00
15,300.0	89.70	90.00	10,787.4	-272.9	4,693.6	4,693.6	0.00	0.00	0.00
15,400.0	89.70	90.00	10,787.9	-272.9	4,793.6	4,793.6	0.00	0.00	0.00
15,500.0	89.70	90.00	10,788.5	-272.9	4,893.6	4,893.6	0.00	0.00	0.00
15,600.0	89.70	90.00	10,789.0	-272.9	4,993.6	4,993.6	0.00	0.00	0.00
15,700.0	89.70	90.00	10,789.5	-272.9	5,093.6	5,093.6	0.00	0.00	0.00
15,800.0	89.70	90.00	10,790.0	-272.9	5,193.6	5,193.6	0.00	0.00	0.00
15,900.0	89.70	90.00	10,790.6	-272.9	5,293.6	5,293.6	0.00	0.00	0.00
16,000.0	89.70	90.00	10,791.1	-272.9	5,393.6	5,393.6	0.00	0.00	0.00
16,100.0	89.70	90.00	10,791.6	-272.9	5,493.6	5,493.6	0.00	0.00	0.00
16,200.0	89.70	90.00	10,792.1	-272.9	5,593.6	5,593.6	0.00	0.00	0.00
16,300.0	89.70	90.00	10,792.7	-272.9	5,693.6	5,693.6	0.00	0.00	0.00
16,400.0	89.70	90.00	10,793.2	-272.9	5,793.6	5,793.6	0.00	0.00	0.00
16,500.0	89.70	90.00	10,793.7	-272.9	5,893.6	5,893.6	0.00	0.00	0.00
16,600.0	89.70	90.00	10,794.2	-272.9	5,993.6	5,993.6	0.00	0.00	0.00
16,700.0	89.70	90.00	10,794.8	-272.9	6,093.6	6,093.6	0.00	0.00	0.00
16,800.0	89.70	90.00	10,795.3	-272.9	6,193.6	6,193.6	0.00	0.00	0.00
16,900.0	89.70	90.00	10,795.8	-272.9	6,293.6	6,293.6	0.00	0.00	0.00
17,000.0	89.70	90.00	10,796.3	-272.9	6,393.6	6,393.6	0.00	0.00	0.00
17,100.0	89.70	90.00	10,796.8	-272.9	6,493.6	6,493.6	0.00	0.00	0.00
17,200.0	89.70	90.00	10,797.4	-272.9	6,593.6	6,593.6	0.00	0.00	0.00
17,300.0	89.70	90.00	10,797.9	-272.9	6,693.6	6,693.6	0.00	0.00	0.00
17,400.0	89.70	90.00	10,798.4	-272.9	6,793.6	6,793.6	0.00	0.00	0.00
17,500.0	89.70	90.00	10,798.9	-272.9	6,893.6	6,893.6	0.00	0.00	0.00
17,600.0	89.70	90.00	10,799.5	-272.9	6,993.6	6,993.6	0.00	0.00	0.00
17,700.0	89.70	90.00	10,800.0	-272.9	7,093.6	7,093.6	0.00	0.00	0.00
17,800.0	89.70	90.00	10,800.5	-272.9	7,193.6	7,193.6	0.00	0.00	0.00
17,900.0	89.70	90.00	10,801.0	-272.9	7,293.6	7,293.6	0.00	0.00	0.00
18,000.0	89.70	90.00	10,801.6	-272.9	7,393.6	7,393.6	0.00	0.00	0.00
18,100.0	89.70	90.00	10,802.1	-272.9	7,493.6	7,493.6	0.00	0.00	0.00
18,200.0	89.70	90.00	10,802.6	-272.9	7,593.6	7,593.6	0.00	0.00	0.00
18,300.0	89.70	90.00	10,803.1	-272.9	7,693.6	7,693.6	0.00	0.00	0.00

Database:	EDM_new	Local Co-ordinate Reference:	Well Kline Federal 5300 31-18 8T
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 8T	Survey Calculation Method:	Minimum Curvature
Wellbore:	Kline Federal 5300 31-18 8T		
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	89.70	90.00	10,803.7	-272.9	7,793.6	7,793.6	0.00	0.00	0.00
18,500.0	89.70	90.00	10,804.2	-272.9	7,893.6	7,893.6	0.00	0.00	0.00
18,600.0	89.70	90.00	10,804.7	-272.9	7,993.6	7,993.6	0.00	0.00	0.00
18,700.0	89.70	90.00	10,805.2	-272.9	8,093.6	8,093.6	0.00	0.00	0.00
18,800.0	89.70	90.00	10,805.7	-272.9	8,193.6	8,193.6	0.00	0.00	0.00
18,900.0	89.70	90.00	10,806.3	-272.9	8,293.6	8,293.6	0.00	0.00	0.00
19,000.0	89.70	90.00	10,806.8	-272.9	8,393.6	8,393.6	0.00	0.00	0.00
19,100.0	89.70	90.00	10,807.3	-272.9	8,493.6	8,493.6	0.00	0.00	0.00
19,200.0	89.70	90.00	10,807.8	-272.9	8,593.6	8,593.6	0.00	0.00	0.00
19,300.0	89.70	90.00	10,808.4	-272.9	8,693.6	8,693.6	0.00	0.00	0.00
19,400.0	89.70	90.00	10,808.9	-272.9	8,793.6	8,793.6	0.00	0.00	0.00
19,500.0	89.70	90.00	10,809.4	-272.9	8,893.6	8,893.6	0.00	0.00	0.00
19,600.0	89.70	90.00	10,809.9	-272.9	8,993.6	8,993.6	0.00	0.00	0.00
19,700.0	89.70	90.00	10,810.5	-272.9	9,093.6	9,093.6	0.00	0.00	0.00
19,800.0	89.70	90.00	10,811.0	-272.9	9,193.6	9,193.6	0.00	0.00	0.00
19,900.0	89.70	90.00	10,811.5	-272.9	9,293.6	9,293.6	0.00	0.00	0.00
20,000.0	89.70	90.00	10,812.0	-272.9	9,393.6	9,393.6	0.00	0.00	0.00
20,100.0	89.70	90.00	10,812.6	-272.9	9,493.6	9,493.6	0.00	0.00	0.00
20,200.0	89.70	90.00	10,813.1	-272.9	9,593.6	9,593.6	0.00	0.00	0.00
20,300.0	89.70	90.00	10,813.6	-272.9	9,693.6	9,693.6	0.00	0.00	0.00
20,400.0	89.70	90.00	10,814.1	-272.9	9,793.6	9,793.6	0.00	0.00	0.00
20,500.0	89.70	90.00	10,814.6	-272.9	9,893.6	9,893.6	0.00	0.00	0.00
20,600.0	89.70	90.00	10,815.2	-272.9	9,993.6	9,993.6	0.00	0.00	0.00
20,656.4	89.70	90.00	10,815.5	-272.9	10,050.0	10,050.0	0.00	0.00	0.00
Kline Federal 5300 31-18 8T 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	0.00	0.00	10,815.5	-273.0	10,050.0	406,544.02	1,220,121.87	48° 4' 25.439 N	103° 33' 43.386 W
- plan misses target center by 0.1usft at 20656.4usft MD (10815.5 TVD, -272.9 N, 10050.0 E)									
- Point									

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
6,101.1	6,101.0	9-5/8" Dakota String	9-5/8	12-1/4
11,036.0	10,765.0	7" Intermediate	7	8-3/4

Database:	EDM_new	Local Co-ordinate Reference:	Well Kline Federal 5300 31-18 8T
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 8T	Survey Calculation Method:	Minimum Curvature
Wellbore:	Kline Federal 5300 31-18 8T		
Design:	Design #1		

Formations

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
1,923.0	1,923.0	Pierre			
4,570.1	4,570.0	Greenhorn			
4,976.1	4,976.0	Mowry			
5,403.1	5,403.0	Dakota			
6,402.2	6,402.0	Rierdon			
6,740.2	6,740.0	Dunham Salt			
6,851.2	6,851.0	Dunham Salt Base			
6,948.2	6,948.0	Spearfish			
7,203.2	7,203.0	Pine Salt			
7,251.2	7,251.0	Pine Salt Base			
7,296.2	7,296.0	Opeche Salt			
7,326.2	7,326.0	Opeche Salt Base			
7,528.2	7,528.0	Broom Creek (Top of Minnelusa Gp.			
7,608.2	7,608.0	Amsden			
7,776.2	7,776.0	Tyler			
7,967.2	7,967.0	Otter (Base of Minnelusa Gp.)			
8,322.2	8,322.0	Kibbey Lime			
8,472.2	8,472.0	Charles Salt			
9,096.2	9,096.0	UB			
9,171.2	9,171.0	Base Last Salt			
9,219.2	9,219.0	Ratcliffe			
9,395.2	9,395.0	Mission Canyon			
9,957.2	9,957.0	Lodgepole			
10,163.2	10,163.0	Lodgepole Fracture Zone			
10,703.9	10,653.0	False Bakken			
10,719.8	10,663.0	Upper Bakken			
10,743.2	10,677.0	Middle Bakken			
10,833.5	10,722.0	Lower Bakken			
10,870.4	10,736.0	Pronghorn			
10,909.8	10,748.0	Three Forks			
10,968.3	10,760.0	TF Target Top			
11,973.0	10,770.0	TF Target Base			
12,164.0	10,771.0	Claystone			

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	Local Coordinates +E/-W (usft)	Comment
10,287.8	10,287.6	50.0	0.0	KOP Build 12°/100'
11,035.3	10,765.0	-108.6	447.7	EOC

Project: Indian Hills
Site: 153N-100W-17/18
Well: Kline Federal 5300 31-18 8T
Wellbore: Kline Federal 5300 31-18 8T
Design: Design #1

OASIS PETROLEUM

WELL DETAILS: Kline Federal 5300 31-18 8T

Ground Level: 2008.0

Northing	Easting	Latitude	Longitude
407221.73	1210091.04	48° 4' 28.160 N	103° 36' 11.380 W

CASING DETAILS

TVD	MD	Name	Size
2023.0	2023.0	Surface	13-3/8
6101.0	6101.1	Dakota String	9-5/8
10765.0	11036.0	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	
2200.0	0.00	0.00	2200.0	0.0	0.0	0.00	
2216.7	0.50	0.00	2216.7	0.1	0.0	3.00	
7926.7	0.50	0.00	7926.4	49.9	0.0	0.00	
7943.3	0.00	0.00	7943.1	50.0	0.0	3.00	
10287.8	0.00	0.00	10287.6	50.0	0.0	0.00	
11035.3	89.70	109.50	10765.0	-108.6	447.7	12.00	
12010.3	89.70	90.00	10770.2	-272.9	1404.0	2.00	
20656.4	89.70	90.00	10815.5	-272.9	10050.0	0.00	PBHL

DRILLING PLAN

OPERATOR	Oasis Petroleum	**COUNTY/STATE**	McKenzie Co., ND
WELL NAME	Kline Federal 5300 31-18 8T	**RIG**	0
WELL TYPE	Horizontal Upper Three Forks		
LOCATION	NWSW 18-153N-100W Surface Location (survey plat): 2523' fsl 238' fwl		
EST. T.D.	20,656'	**GROUND ELEV:**	2008 Finished Pad Elev **Sub Height:** 25
	TOTAL LATERAL 9,620'	**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 Lime		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		9,395	(7,362)
Lodgepole		9,957	(7,924)
Lodgepole Fracture Zone		10,163	(8,130)
False Bakken		10,653	(8,620)
Upper Bakken		10,663	(8,630)
Middle Bakken		10,677	(8,644)
Lower Bakken		10,722	(8,689)
Pronghorn		10,736	(8,703)
Three Forks		10,748	(8,715)
TF Target Top		10,760	(8,727)
TF Target Base		10,770	(8,737)
Claystone		10,771	(8,738)

Dip Rate: 0.3

Max. Anticipated BHP: 4662

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' -	11,036'	Invert	9.5-10.4	40-50	30+HtHp	Circ Mud Tanks
Lateral:	11,036' -	20,656'	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#	8-3/4"	11,036'		3903	24	1500' above Dakota
Production Liner:	4-1/2"	13.5#	6"	20,656'	TOL @ 10,238'			50' above KOP

PROBABLE PLUGS, IF REQ'D:

OTHER:

	MD	TVD	FNL/FSL	FEL/FWL	S-T-R	AZI
Surface:	2,023	2,023	2523' FSL	238' FWL	SEC 18-T153N-R100W	Survey Company:
KOP:	10,288'	10,288'	2573' FSL	238' FWL	SEC 18-T153N-R100W	Build Rate: 12 deg /100'
EOC:	11,035'	10,765'	2414' FSL	686' FWL	SEC 18-T153N-R100W	109.50
Casing Point:	11,036'	10,765'	2414' FSL	686' FWL	SEC 18-T153N-R100W	109.50
Upper Threeforks Lateral TD:	20,656'	10,816'	2250' FSL	200' FEL	SEC 17-T153N-R100W	90.00

Comments:

Request a Sundry for an Open Hole Log Waiver

Exception well: Oasis Petroleum's Kline 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 (5/5/2014) **Engineering:** hlbader rpm 7/18/14

Oasis Petroleum
Well Summary
Kline Federal 5300 31-18 8T
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 8T
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' 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 8T
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' – 10,288'	32	HCP-110	LTC	6.094"	6.000***	6,730	8,970	11,210
7"	10,288' – 11,036'	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 / 2.09
6,590' – 10,288'	3,698'	7", 32#, HCP-110, LTC, 8rd	11820 / 2.20*	12460 / 1.29	
6,590' – 10,288'	3,698'	7", 32#, HCP-110, LTC, 8rd	11820 / 1.08**	12460 / 1.29	
10,288' – 11,036'	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.

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

c) Based on string weight in 10 ppg fluid, (281k 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: **617 sks** (170 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 8T
Section 18 T153N R100W
McKenzie County, ND

PRODUCTION LINER

Size	**Interval**	**Weight**	**Grade**	**Coupling**	**I.D.**	**Drift**	**Estimated Torque**
4-1/2"	10,238' – 20,656'	13.5	P-110	BTC	3.92"	3.795"	4,500

Interval	**Description**	**Collapse**	**Burst**	**Tension**
		(psi) **a**	(psi) **b**	(1000 lbs) **c**
10,238' – 20,656'	4-1/2", 13.5 lb, P-110, BTC, 8rd	10680 / 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 @ 10,816' TVD.

b) Burst pressure based on 9000 psi treating pressure with 10.2 ppg internal fluid gradient and 9 ppg external fluid gradient @ 10,816' TVD.

c) Based on string weight in 9.5 ppg fluid (Buoyed weight: 120k 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)

SUNDRY NOTICES AND REPORTS ON WELLS - FORM 4

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

JUL 2014 RECEIVED ND OIL & GAS DIVISION

Well File No. **28653**

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

- [x] Notice of Intent — Approximate Start Date: **July 28, 2014**
- [ ] Report of Work Done — Date Work Completed:
- [ ] Notice of Intent to Begin a Workover Project that may Qualify for a Tax Exemption Pursuant to NDCC Section 57-51.1-03. — Approximate Start Date:

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

Well Name and Number					
Kline Federal 5300 41-18 11T2					
Footages	Qtr-Qtr	Section	Township	Range	
467 F S L 237 F W L	**SWSW**	**18**	**153 N**	**100 W**	
Field	Pool	County			
Baker	**Bakken**	**McKenzie**			

24-HOUR PRODUCTION RATE

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

Name of Contractor(s)			
Address	City	State	Zip Code

DETAILS OF WORK

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

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

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

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

FOR STATE USE ONLY

- [ ] Received
- [x] Approved

Date: 8-5-14

By: Nathan Erbele

Title: Petroleum Resource Specialist

Oasis Petroleum

Indian Hills
153N-100W-17/18
Kline Federal 5300 41-18 11T2

Kline Federal 5300 41-18 11T2

Plan: Design #1

Standard Planning Report

23 May, 2014

RYAN DIRECTIONAL SERVICES
A NABORS COMPANY

Project: Indian Hills
Site: 153N-100W-17/18
Well: Kline Federal 5300 41-18 11T2
Wellbore: Kline Federal 5300 41-18 11T2
Design: Design #1

OASIS PETROLEUM

WELL DETAILS: Kline Federal 5300 41-18 11T2

Ground Level: 2057.0

Northing	Easting	Latitude	Longitude
405170.05	1209969.56	48° 4' 7.880 N	103° 36' 11.950 W

CASING DETAILS

TVD	MD	Name	Size
10870.0	11142.0	7"	7

Azimuths to True North
Magnetic North: 8.27°

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

SECTION DETAILS

MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	Target
0.0	0.00	0.00	0.0	0.0	0.0	0.00	
10392.5	0.00	0.00	10392.5	0.0	0.0	0.00	
11141.7	89.90	74.20	10870.0	129.8	458.6	12.00	
11931.7	89.90	90.00	10871.4	238.0	1238.6	2.00	
20743.0	89.90	90.00	10886.7	238.0	10050.0	0.00	5300 41-18 11T2 PBHL

Database:	EDM 5000.1 Single User Db	**Local Co-ordinate Reference:**	Well Kline Federal 5300 41-18 11T2
Company:	Oasis Petroleum	**TVD Reference:**	WELL @ 2082.0usft (Original Well Elev)
Project:	Indian Hills	**MD Reference:**	WELL @ 2082.0usft (Original Well Elev)
Site:	153N-100W-17/18	**North Reference:**	True
Well:	Kline Federal 5300 41-18 11T2	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Kline Federal 5300 41-18 11T2		
Design:	Design #1		

Project Indian Hills

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

Site 153N-100W-17/18

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

Well Kline Federal 5300 41-18 11T2

Well Position	**+N/-S**	-3,799.8 usft	**Northing:**	405,170.05 usft	**Latitude:**	48° 4' 7.880 N
	+E/-W	-106.6 usft	**Easting:**	1,209,969.56 usft	**Longitude:**	103° 36' 11.950 W
Position Uncertainty		2.0 usft	**Wellhead Elevation:**		**Ground Level:**	2,057.0 usft

Wellbore Kline Federal 5300 41-18 11T2

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

Design Design #1

Audit Notes:

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

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

Plan Sections

Measured Depth (usft)	**Inclination (°)**	**Azimuth (°)**	**Vertical Depth (usft)**	**+N/-S (usft)**	**+E/-W (usft)**	**Dogleg Rate (°/100usft)**	**Build Rate (°/100usft)**	**Turn Rate (°/100usft)**	**TFO (°)**	**Target**
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	
10,392.5	0.00	0.00	10,392.5	0.0	0.0	0.00	0.00	0.00	0.00	
11,141.7	89.90	74.20	10,870.0	129.8	458.6	12.00	12.00	0.00	74.20	
11,931.7	89.90	90.00	10,871.4	238.0	1,238.6	2.00	0.00	2.00	90.01	
20,743.0	89.90	90.00	10,886.7	238.0	10,050.0	0.00	0.00	0.00	0.00	5300 41-18 11T2 PBH

Database:	EDM 5000.1 Single User Db	**Local Co-ordinate Reference:**	Well Kline Federal 5300 41-18 11T2
Company:	Oasis Petroleum	**TVD Reference:**	WELL @ 2082.0usft (Original Well Elev)
Project:	Indian Hills	**MD Reference:**	WELL @ 2082.0usft (Original Well Elev)
Site:	153N-100W-17/18	**North Reference:**	True
Well:	Kline Federal 5300 41-18 11T2	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Kline Federal 5300 41-18 11T2		
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)
10,392.5	0.00	0.00	10,392.5	0.0	0.0	0.0	0.00	0.00	0.00
KOP Build 12°/100'									
10,400.0	0.90	74.20	10,400.0	0.0	0.1	0.1	12.00	12.00	0.00
10,425.0	3.90	74.20	10,425.0	0.3	1.1	1.1	12.00	12.00	0.00
10,450.0	6.90	74.20	10,449.9	0.9	3.3	3.3	12.00	12.00	0.00
10,475.0	9.90	74.20	10,474.6	1.9	6.8	6.8	12.00	12.00	0.00
10,500.0	12.90	74.20	10,499.1	3.3	11.6	11.6	12.00	12.00	0.00
10,525.0	15.90	74.20	10,523.3	5.0	17.6	17.6	12.00	12.00	0.00
10,550.0	18.90	74.20	10,547.2	7.0	24.8	24.8	12.00	12.00	0.00
10,575.0	21.90	74.20	10,570.6	9.4	33.2	33.2	12.00	12.00	0.00
10,600.0	24.90	74.20	10,593.5	12.1	42.7	42.7	12.00	12.00	0.00
10,625.0	27.90	74.20	10,615.9	15.1	53.4	53.4	12.00	12.00	0.00
10,650.0	30.90	74.20	10,637.7	18.5	65.2	65.2	12.00	12.00	0.00
10,675.0	33.90	74.20	10,658.8	22.1	78.1	78.1	12.00	12.00	0.00
10,700.0	36.90	74.20	10,679.2	26.0	92.0	92.0	12.00	12.00	0.00
10,725.0	39.90	74.20	10,698.8	30.3	107.0	107.0	12.00	12.00	0.00
10,750.0	42.90	74.20	10,717.5	34.8	122.9	122.9	12.00	12.00	0.00
10,761.7	44.31	74.20	10,726.0	37.0	130.6	130.6	12.00	12.00	0.00
False Bakken									
10,774.5	45.83	74.20	10,735.0	39.4	139.3	139.3	12.00	12.00	0.00
Upper Bakken									
10,775.0	45.90	74.20	10,735.4	39.5	139.7	139.7	12.00	12.00	0.00
10,798.0	48.66	74.20	10,751.0	44.1	156.0	156.0	12.00	12.00	0.00
Middle Bakken									
10,800.0	48.90	74.20	10,752.3	44.5	157.4	157.4	12.00	12.00	0.00
10,825.0	51.90	74.20	10,768.2	49.8	175.9	175.9	12.00	12.00	0.00
10,850.0	54.90	74.20	10,783.1	55.3	195.3	195.3	12.00	12.00	0.00
10,853.3	55.29	74.20	10,785.0	56.0	197.8	197.8	12.00	12.00	0.00
Lower Bakken									
10,864.0	56.58	74.20	10,791.0	58.4	206.4	206.4	12.00	12.00	0.00
Pronghorn									
10,875.0	57.90	74.20	10,797.0	60.9	215.3	215.3	12.00	12.00	0.00
10,900.0	60.90	74.20	10,809.7	66.8	236.0	236.0	12.00	12.00	0.00
10,906.9	61.73	74.20	10,813.0	68.4	241.8	241.8	12.00	12.00	0.00
Three Forks 1st Bench									
10,925.0	63.90	74.20	10,821.3	72.8	257.3	257.3	12.00	12.00	0.00
10,950.0	66.90	74.20	10,831.7	79.0	279.2	279.2	12.00	12.00	0.00
10,966.8	68.92	74.20	10,838.0	83.2	294.2	294.2	12.00	12.00	0.00
Three Forks 1st Bench Claystone									
10,975.0	69.90	74.20	10,840.9	85.3	301.5	301.5	12.00	12.00	0.00
11,000.0	72.90	74.20	10,848.9	91.8	324.3	324.3	12.00	12.00	0.00
11,007.5	73.80	74.20	10,851.0	93.7	331.2	331.2	12.00	12.00	0.00
Three Forks 2nd Bench									
11,025.0	75.90	74.20	10,855.6	98.3	347.5	347.5	12.00	12.00	0.00
11,050.0	78.90	74.20	10,861.0	105.0	371.0	371.0	12.00	12.00	0.00
11,075.0	81.90	74.20	10,865.2	111.7	394.7	394.7	12.00	12.00	0.00
11,100.0	84.90	74.20	10,868.1	118.4	418.6	418.6	12.00	12.00	0.00
11,125.0	87.90	74.20	10,869.6	125.2	442.6	442.6	12.00	12.00	0.00
11,141.7	89.90	74.20	10,870.0	129.8	458.7	458.7	11.98	11.98	0.00
EOC									
11,142.0	89.90	74.21	10,870.0	129.9	458.9	458.9	2.22	0.00	2.22
7"									
11,200.0	89.90	75.37	10,870.1	145.1	514.9	514.9	2.00	0.00	2.00

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Well:	Kline Federal 5300 41-18 11T2	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Kline Federal 5300 41-18 11T2		
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)
11,300.0	89.90	77.37	10,870.2	168.7	612.1	612.1	2.00	0.00	2.00
11,400.0	89.90	79.37	10,870.4	188.8	710.0	710.0	2.00	0.00	2.00
11,500.0	89.90	81.37	10,870.6	205.6	808.6	808.6	2.00	0.00	2.00
11,600.0	89.90	83.37	10,870.8	218.8	907.7	907.7	2.00	0.00	2.00
11,700.0	89.90	85.37	10,870.9	228.7	1,007.2	1,007.2	2.00	0.00	2.00
11,800.0	89.90	87.37	10,871.1	235.0	1,107.0	1,107.0	2.00	0.00	2.00
11,900.0	89.90	89.37	10,871.3	237.8	1,207.0	1,207.0	2.00	0.00	2.00
11,931.7	89.90	90.00	10,871.4	238.0	1,238.6	1,238.6	2.00	0.00	2.00
12,000.0	89.90	90.00	10,871.5	238.0	1,307.0	1,307.0	0.00	0.00	0.00
12,100.0	89.90	90.00	10,871.6	238.0	1,407.0	1,407.0	0.00	0.00	0.00
12,200.0	89.90	90.00	10,871.8	238.0	1,507.0	1,507.0	0.00	0.00	0.00
12,300.0	89.90	90.00	10,872.0	238.0	1,607.0	1,607.0	0.00	0.00	0.00
12,400.0	89.90	90.00	10,872.2	238.0	1,707.0	1,707.0	0.00	0.00	0.00
12,500.0	89.90	90.00	10,872.3	238.0	1,807.0	1,807.0	0.00	0.00	0.00
12,600.0	89.90	90.00	10,872.5	238.0	1,907.0	1,907.0	0.00	0.00	0.00
12,700.0	89.90	90.00	10,872.7	238.0	2,007.0	2,007.0	0.00	0.00	0.00
12,800.0	89.90	90.00	10,872.9	238.0	2,107.0	2,107.0	0.00	0.00	0.00
12,900.0	89.90	90.00	10,873.0	238.0	2,207.0	2,207.0	0.00	0.00	0.00
13,000.0	89.90	90.00	10,873.2	238.0	2,307.0	2,307.0	0.00	0.00	0.00
13,100.0	89.90	90.00	10,873.4	238.0	2,407.0	2,407.0	0.00	0.00	0.00
13,200.0	89.90	90.00	10,873.6	238.0	2,507.0	2,507.0	0.00	0.00	0.00
13,300.0	89.90	90.00	10,873.7	238.0	2,607.0	2,607.0	0.00	0.00	0.00
13,400.0	89.90	90.00	10,873.9	238.0	2,707.0	2,707.0	0.00	0.00	0.00
13,500.0	89.90	90.00	10,874.1	238.0	2,807.0	2,807.0	0.00	0.00	0.00
13,600.0	89.90	90.00	10,874.3	238.0	2,907.0	2,907.0	0.00	0.00	0.00
13,700.0	89.90	90.00	10,874.4	238.0	3,007.0	3,007.0	0.00	0.00	0.00
13,800.0	89.90	90.00	10,874.6	238.0	3,107.0	3,107.0	0.00	0.00	0.00
13,900.0	89.90	90.00	10,874.8	238.0	3,207.0	3,207.0	0.00	0.00	0.00
14,000.0	89.90	90.00	10,875.0	238.0	3,307.0	3,307.0	0.00	0.00	0.00
14,100.0	89.90	90.00	10,875.1	238.0	3,407.0	3,407.0	0.00	0.00	0.00
14,200.0	89.90	90.00	10,875.3	238.0	3,507.0	3,507.0	0.00	0.00	0.00
14,300.0	89.90	90.00	10,875.5	238.0	3,607.0	3,607.0	0.00	0.00	0.00
14,400.0	89.90	90.00	10,875.7	238.0	3,707.0	3,707.0	0.00	0.00	0.00
14,500.0	89.90	90.00	10,875.8	238.0	3,807.0	3,807.0	0.00	0.00	0.00
14,600.0	89.90	90.00	10,876.0	238.0	3,907.0	3,907.0	0.00	0.00	0.00
14,700.0	89.90	90.00	10,876.2	238.0	4,007.0	4,007.0	0.00	0.00	0.00
14,800.0	89.90	90.00	10,876.4	238.0	4,107.0	4,107.0	0.00	0.00	0.00
14,900.0	89.90	90.00	10,876.5	238.0	4,207.0	4,207.0	0.00	0.00	0.00
15,000.0	89.90	90.00	10,876.7	238.0	4,307.0	4,307.0	0.00	0.00	0.00
15,100.0	89.90	90.00	10,876.9	238.0	4,407.0	4,407.0	0.00	0.00	0.00
15,200.0	89.90	90.00	10,877.1	238.0	4,507.0	4,507.0	0.00	0.00	0.00
15,300.0	89.90	90.00	10,877.2	238.0	4,607.0	4,607.0	0.00	0.00	0.00
15,400.0	89.90	90.00	10,877.4	238.0	4,707.0	4,707.0	0.00	0.00	0.00
15,500.0	89.90	90.00	10,877.6	238.0	4,807.0	4,807.0	0.00	0.00	0.00
15,600.0	89.90	90.00	10,877.8	238.0	4,907.0	4,907.0	0.00	0.00	0.00
15,700.0	89.90	90.00	10,877.9	238.0	5,007.0	5,007.0	0.00	0.00	0.00
15,740.9	89.90	90.00	10,878.0	238.0	5,047.8	5,047.8	0.00	0.00	0.00
Three Forks 2nd Bench Claystone									
15,800.0	89.90	90.00	10,878.1	238.0	5,107.0	5,107.0	0.00	0.00	0.00
15,900.0	89.90	90.00	10,878.3	238.0	5,207.0	5,207.0	0.00	0.00	0.00
16,000.0	89.90	90.00	10,878.5	238.0	5,307.0	5,307.0	0.00	0.00	0.00
16,100.0	89.90	90.00	10,878.6	238.0	5,407.0	5,407.0	0.00	0.00	0.00
16,200.0	89.90	90.00	10,878.8	238.0	5,507.0	5,507.0	0.00	0.00	0.00

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Site:	153N-100W-17/18	**North Reference:**	True
Well:	Kline Federal 5300 41-18 11T2	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Kline Federal 5300 41-18 11T2		
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)
16,300.0	89.90	90.00	10,879.0	238.0	5,607.0	5,607.0	0.00	0.00	0.00
16,400.0	89.90	90.00	10,879.2	238.0	5,707.0	5,707.0	0.00	0.00	0.00
16,500.0	89.90	90.00	10,879.3	238.0	5,807.0	5,807.0	0.00	0.00	0.00
16,600.0	89.90	90.00	10,879.5	238.0	5,907.0	5,907.0	0.00	0.00	0.00
16,700.0	89.90	90.00	10,879.7	238.0	6,007.0	6,007.0	0.00	0.00	0.00
16,800.0	89.90	90.00	10,879.8	238.0	6,107.0	6,107.0	0.00	0.00	0.00
16,900.0	89.90	90.00	10,880.0	238.0	6,207.0	6,207.0	0.00	0.00	0.00
17,000.0	89.90	90.00	10,880.2	238.0	6,307.0	6,307.0	0.00	0.00	0.00
17,100.0	89.90	90.00	10,880.4	238.0	6,407.0	6,407.0	0.00	0.00	0.00
17,200.0	89.90	90.00	10,880.5	238.0	6,507.0	6,507.0	0.00	0.00	0.00
17,300.0	89.90	90.00	10,880.7	238.0	6,607.0	6,607.0	0.00	0.00	0.00
17,400.0	89.90	90.00	10,880.9	238.0	6,707.0	6,707.0	0.00	0.00	0.00
17,500.0	89.90	90.00	10,881.1	238.0	6,807.0	6,807.0	0.00	0.00	0.00
17,600.0	89.90	90.00	10,881.2	238.0	6,907.0	6,907.0	0.00	0.00	0.00
17,700.0	89.90	90.00	10,881.4	238.0	7,007.0	7,007.0	0.00	0.00	0.00
17,800.0	89.90	90.00	10,881.6	238.0	7,107.0	7,107.0	0.00	0.00	0.00
17,900.0	89.90	90.00	10,881.8	238.0	7,207.0	7,207.0	0.00	0.00	0.00
18,000.0	89.90	90.00	10,881.9	238.0	7,307.0	7,307.0	0.00	0.00	0.00
18,100.0	89.90	90.00	10,882.1	238.0	7,407.0	7,407.0	0.00	0.00	0.00
18,200.0	89.90	90.00	10,882.3	238.0	7,507.0	7,507.0	0.00	0.00	0.00
18,300.0	89.90	90.00	10,882.5	238.0	7,607.0	7,607.0	0.00	0.00	0.00
18,400.0	89.90	90.00	10,882.6	238.0	7,707.0	7,707.0	0.00	0.00	0.00
18,500.0	89.90	90.00	10,882.8	238.0	7,807.0	7,807.0	0.00	0.00	0.00
18,600.0	89.90	90.00	10,883.0	238.0	7,907.0	7,907.0	0.00	0.00	0.00
18,700.0	89.90	90.00	10,883.2	238.0	8,007.0	8,007.0	0.00	0.00	0.00
18,800.0	89.90	90.00	10,883.3	238.0	8,107.0	8,107.0	0.00	0.00	0.00
18,900.0	89.90	90.00	10,883.5	238.0	8,207.0	8,207.0	0.00	0.00	0.00
19,000.0	89.90	90.00	10,883.7	238.0	8,307.0	8,307.0	0.00	0.00	0.00
19,100.0	89.90	90.00	10,883.9	238.0	8,407.0	8,407.0	0.00	0.00	0.00
19,200.0	89.90	90.00	10,884.0	238.0	8,507.0	8,507.0	0.00	0.00	0.00
19,300.0	89.90	90.00	10,884.2	238.0	8,607.0	8,607.0	0.00	0.00	0.00
19,400.0	89.90	90.00	10,884.4	238.0	8,707.0	8,707.0	0.00	0.00	0.00
19,500.0	89.90	90.00	10,884.6	238.0	8,807.0	8,807.0	0.00	0.00	0.00
19,600.0	89.90	90.00	10,884.7	238.0	8,907.0	8,907.0	0.00	0.00	0.00
19,700.0	89.90	90.00	10,884.9	238.0	9,007.0	9,007.0	0.00	0.00	0.00
19,800.0	89.90	90.00	10,885.1	238.0	9,107.0	9,107.0	0.00	0.00	0.00
19,900.0	89.90	90.00	10,885.3	238.0	9,207.0	9,207.0	0.00	0.00	0.00
20,000.0	89.90	90.00	10,885.4	238.0	9,307.0	9,307.0	0.00	0.00	0.00
20,100.0	89.90	90.00	10,885.6	238.0	9,407.0	9,407.0	0.00	0.00	0.00
20,200.0	89.90	90.00	10,885.8	238.0	9,507.0	9,507.0	0.00	0.00	0.00
20,300.0	89.90	90.00	10,886.0	238.0	9,607.0	9,607.0	0.00	0.00	0.00
20,400.0	89.90	90.00	10,886.1	238.0	9,707.0	9,707.0	0.00	0.00	0.00
20,500.0	89.90	90.00	10,886.3	238.0	9,807.0	9,807.0	0.00	0.00	0.00
20,600.0	89.90	90.00	10,886.5	238.0	9,907.0	9,907.0	0.00	0.00	0.00
20,700.0	89.90	90.00	10,886.7	238.0	10,007.0	10,007.0	0.00	0.00	0.00
20,743.0	89.90	90.00	10,886.7	238.0	10,050.0	10,050.0	0.00	0.00	0.00

5300 41-18 11T2 PBHL

Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well Kline Federal 5300 41-18 11T2
Company:	Oasis Petroleum	TVD Reference:	WELL @ 2082.0usft (Original Well Elev)
Project:	Indian Hills	MD Reference:	WELL @ 2082.0usft (Original Well Elev)
Site:	153N-100W-17/18	North Reference:	True
Well:	Kline Federal 5300 41-18 11T2	Survey Calculation Method:	Minimum Curvature
Wellbore:	Kline Federal 5300 41-18 11T2		
Design:	Design #1		

Design Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
5300 41-18 11T2 PBHL - plan hits target center - Point	0.00	0.00	10,886.7	238.0	10,050.0	405,002.90	1,220,020.99	48° 4' 10.202 N	103° 33' 43.968 W

Casing Points

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
11,142.0	10,870.0	7"	7	8-3/4

Database:	EDM 5000.1 Single User Db	**Local Co-ordinate Reference:**	Well Kline Federal 5300 41-18 11T2
Company:	Oasis Petroleum	**TVD Reference:**	WELL @ 2082.0usft (Original Well Elev)
Project:	Indian Hills	**MD Reference:**	WELL @ 2082.0usft (Original Well Elev)
Site:	153N-100W-17/18	**North Reference:**	True
Well:	Kline Federal 5300 41-18 11T2	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Kline Federal 5300 41-18 11T2		
Design:	Design #1		

Formations

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
1,972.0	1,972.0	Pierre			
4,646.0	4,646.0	Greenhorn			
5,057.0	5,057.0	Mowry			
5,471.0	5,471.0	Dakota			
6,486.0	6,486.0	Rierdon			
6,814.0	6,814.0	Dunham Salt			
6,929.0	6,929.0	Dunham Salt Base			
7,024.0	7,024.0	Spearfish			
7,283.0	7,283.0	Pine Salt			
7,318.0	7,318.0	Pine Salt Base			
7,374.0	7,374.0	Opeche Salt			
7,403.0	7,403.0	Opeche Salt Base			
7,605.0	7,605.0	Broom Creek (Top of Minnelusa Gp.)			
7,684.0	7,684.0	Amsden			
7,853.0	7,853.0	Tyler			
8,047.0	8,047.0	Otter (Base of Minnelusa Gp.)			
8,390.0	8,390.0	Kibbey			
8,542.0	8,542.0	Charles Salt			
9,159.0	9,159.0	UB			
9,238.0	9,238.0	Base Last Salt			
9,301.0	9,301.0	Ratcliffe			
9,454.0	9,454.0	Mission Canyon			
10,022.0	10,022.0	Lodgepole			
10,209.0	10,209.0	Lodgepole Fracture Zone			
10,761.7	10,726.0	False Bakken			
10,774.5	10,735.0	Upper Bakken			
10,798.0	10,751.0	Middle Bakken			
10,853.3	10,785.0	Lower Bakken			
10,864.0	10,791.0	Pronghorn			
10,906.9	10,813.0	Three Forks 1st Bench			
10,966.8	10,838.0	Three Forks 1st Bench Claystone			
11,007.5	10,851.0	Three Forks 2nd Bench			
15,740.9	10,878.0	Three Forks 2nd Bench Claystone			

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	Local Coordinates +E/-W (usft)	Comment
10,392.5	10,392.5	0.0	0.0	KOP Build 12°/100'
11,141.7	10,870.0	129.8	458.7	EOC

Oasis Petroleum
Well Summary
Kline Federal 5300 41-18 11T2
Section 18 T153N R100W
McKenzie County, ND

SURFACE CASING AND CEMENT DESIGN

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

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

API Rating & Safety Factor

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

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

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

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

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

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

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

Oasis Petroleum
Well Summary
Kline Federal 5300 31-18 11T2
Section 18 T153N R100W
McKenzie County, ND

CONTINGENCY SURFACE CASING AND CEMENT DESIGN

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

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

API Rating & Safety Factor

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

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

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

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

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

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

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

Oasis Petroleum
Well Summary
Kline Federal 5300 41-18 11T2
Section 18 T153N R100W
McKenzie County, ND

INTERMEDIATE CASING AND CEMENT DESIGN

							Make-up Torque (ft-lbs)		
Size	**Interval**	**Weight**	**Grade**	**Coupling**	**I.D.**	**Drift**	**Minimum**	**Optimum**	**Max**
7"	0' – 6,664'	29	P-110	LTC	6.184"	6.059"	5,980	7,970	8,770
7"	6,664' – 10,393'	32	HCP-110	LTC	6.094"	6.000***	6,730	8,970	9,870
7"	10,393' – 11,142'	29	P-110	LTC	6.184"	6.059"	5,980	7,970	8,770

***Special drift

Interval	Length	Description	Collapse	Burst	Tension
			(psi) a	(psi) b	(1000 lbs) c
0' – 6,664'	6,664'	7", 29#, P-110, LTC, 8rd	8530 / 2.46*	11220 / 1.19	797 / 2.07
6,664' – 10,393'	3,729'	7", 32#, HCP-110, LTC, 8rd	11820 / 2.18*	12460 / 1.29	
6,664' – 10,393'	3,729'	7", 32#, HCP-110, LTC, 8rd	11820 / 1.07**	12460 / 1.29	
10,393' – 11,142'	749'	7", 29 lb, P-110, LTC, 8rd	8530 / 1.50*	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 10,870' TVD.

c) Based on string weight in 10 ppg fluid, (283k lbs buoyed weight) plus 100k

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

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

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

Tail Slurry: **621 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 41-18 11T2
Section 18 T153N R100W
McKenzie County, ND

PRODUCTION LINER

Size	**Interval**	**Weight**	**Grade**	**Coupling**	**I.D.**	**Drift**	**Estimated Torque**
4-1/2"	10,343' – 20,743'	13.5	P-110	BTC	3.92"	3.795"	4,500

Interval	**Description**	**Collapse**	**Burst**	**Tension**
		(psi) **a**	(psi) **b**	(1000 lbs) **c**
10,343' – 20,743'	4-1/2", 13.5 lb, P-110, BTC, 8rd	10680 / 1.98	12410 / 1.28	443 / 2.01

API Rating & Safety Factor

a) Based on full casing evacuation with 9.5 ppg fluid on backside @ 10,887' TVD.

b) Burst pressure based on 9000 psi treating pressure with 10.2 ppg internal fluid gradient and 9 ppg external fluid gradient @ 10,887' TVD.

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

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

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

DRILLING PLAN

OPERATOR	Oasis Petroleum	**COUNTY/STATE**	McKenzie Co., ND
WELL NAME	Kline Federal 5300 41-18 11T2	**RIG**	0
WELL TYPE	Horizontal Three Forks		
LOCATION	SWSW 18-153N-100W	Surface Location (survey plat): 467' fsl	237' fwl
EST. T.D.	20,743'	**GROUND ELEV:**	2057 Finished Pad Elev. **Sub Height:** 25
	TOTAL LATERAL: 9,601' (est)	**KB ELEV:**	2082

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

MARKER		DEPTH (Surf Loc)	DATUM (Surf Loc)
Pierre	NDIC MAP	1,972	110'
Greenhorn		4,646	-2,564'
Mowry		5,057	-2,975'
Dakota		5,471	-3,389'
Rierdon		6,486	-4,404'
Dunham Salt		6,814	-4,732'
Dunham Salt Base		6,929	-4,847'
Spearfish		7,024	-4,942'
Pine Salt		7,283	-5,201'
Pine Salt Base		7,318	-5,236'
Opeche Salt		7,374	-5,292'
Opeche Salt Base		7,403	-5,321'
Broom Creek (Top of Minnelusa Gp.)		7,605	-5,523'
Amsden		7,684	-5,602'
Tyler		7,853	-5,771'
Otter (Base of Minnelusa Gp.)		8,047	-5,965'
Kibbey		8,390	6,308'
Charles Salt		8,542	-6,460'
UB		9,159	-7,077'
Base Last Salt		9,238	-7,156'
Ratcliffe		9,301	-7,219'
Mission Canyon		9,454	-7,372'
Lodgepole		10,022	-7,940'
Lodgepole Fracture Zone		10,209	-8,127'
False Bakken		10,726	-8,644'
Upper Bakken		10,735	-8,653'
Middle Bakken		10,751	-8,669'
Lower Bakken		10,785	-8,703'
Pronghorn		10,791	-8,709'
Three Forks 1st Bench		10,813	-8,731'
Three Forks 1st Bench Claystone		10,838	-8,756'
Three Forks 2nd Bench		10,851	-8,769'
Three Forks 2nd Bench Claystone		10,878	-8,796'
Three Forks 3rd Bench		10,897	-8,815'

Dip Rate: -0.1

Max. Anticipated BHP: 4714

Surface Formation: *Glacial till*

LOGS:

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

DEVIATION:

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

DST'S: None planned

CORES: None planned

MUDLOGGING:

Two-Man: 8,342'

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

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

BOP:

11" 5000 psi blind, pipe & annular

MUD:	Interval		Type	WT	Vis	WL	Remarks
Surface:	0' -	2,072'	FW/Gel - Lime Sweeps	8.4-9.0	28-32	NC	Circ Mud Tanks
Intermediate:	2,072' -	11,142'	Invert	9.5-10.4	40-50	30+HtHp	Circ Mud Tanks
Lateral:	11,142' -	20,743'	Salt Water	9.8-10.2	28-32	NC	Circ Mud Tanks

CASING:	Size	Wt ppf	Hole	Depth		Cement	WOC	Remarks
Surface:	13-3/8"	54.5#	17-1/2"	2,072'		To Surface	12	100' into Pierre
Dakota Contingency:	9-5/8"	40#	12-1/4"	6,101'		To Surface	12	Below Dakota
Intermediate:	7"	29#	8.75"	11,142'		3,971'	24	1500' above Dakota
Production Liner:	4.5"	13.5#	6"	20,743'	TOL @ 10,343'			50' above KOP

PROBABLE PLUGS, IF REQ'D:

OTHER:

	MD	TVD	FNL/FSL	FEL/FWL	S-T-R	AZI
Surface:	2,072	2,072	467' FSL	237' FWL	SEC 18-T153N-R100W	Survey Company:
KOP:	10,393'	10,393'	467' FSL	237' FWL	SEC 18-T153N-R100W	Build Rate: 12 deg /100'
EOC:	11,142'	10,870'	597' FSL	696' FWL	SEC 18-T153N-R100W	74.20
Casing Point:	11,142'	10,870'	597' FSL	696' FWL	SEC 18-T153N-R100W	74.20
Three Forks Lateral TD:	20,743'	10,887'	750' FSL	200' FEL	SEC 17-T153N-R100W	90.00

Comments:

Request a Sundry for an Open Hole Log Waiver

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

35 packers, 35 sleeves, no frac string

Oasis Petroleum does not use Diesel Fuel, as defined by the US EPA in the list below, in our hydraulic fracture operations.
68334-30-5 (Primary Name: Fuels, diesel) 68476-34-6 (Primary Name: Fuels, diesel, No. 2)68476-30-2 (Primary Name: Fuel oil No. 2)
68476-31-3 (Primary Name: Fuel oil, No. 4)8008-20-6 (Primary Name: Kerosene)

OASIS PETROLEUM

Geology: M.Steed 4/23/14 **Engineering:** hbader rpm 7/18/14

Oasis Petroleum

Indian Hills
153N-100W-17/18
Kline Federal 5300 41-18 10B

Kline Federal 5300 41-18 10B

Plan: Design #1

Standard Planning Report

23 May, 2014

RYAN DIRECTIONAL SERVICES
A NABORS COMPANY

SUNDRY NOTICES AND REPORTS ON WELLS - FORM 4

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

JUL 2014 RECEIVED ND OIL & GAS DIVISION

Well File No. **28754**

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 8T					
Footages		Qtr-Qtr	Section	Township	Range
2523 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 Richard Suggs	
Title Petroleum Resource Specialist	

Oasis

Indian Hills
153N-100W-17/18
Kline Federal 5300 31-18 8T

Kline Federal 5300 31-18 8T
Design #1

Anticollision Report

18 July, 2014

Anticollision Report

Company:	Oasis	**Local Co-ordinate Reference:**	Well Kline Federal 5300 31-18 8T
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 8T	**Survey Calculation Method:**	Minimum Curvature
Well Error:	2.0 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	Kline Federal 5300 31-18 8T	**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	20,656.4	Design #1 (Kline Federal 5300 31-18 8T)	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	65.9	55.5	6.328	CC
Kline Federal 5300 31-18 6B - Kline Federal 5300 31-18	20,656.4	20,694.5	507.7	-69.9	0.879	Level 1, ES, SF
Kline Federal 5300 31-18 7T2 - Kline Federal 5300 31-1ε	2,200.0	2,200.0	32.4	22.0	3.115	CC
Kline Federal 5300 31-18 7T2 - Kline Federal 5300 31-1ε	20,656.4	20,831.5	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

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
0.0	0.0	0.0	0.0	2.0	2.0	180.00	-65.9	0.0	65.9				
100.0	100.0	100.0	100.0	2.0	2.0	180.00	-65.9	0.0	65.9	61.9	4.00	16.451	
200.0	200.0	200.0	200.0	2.0	2.0	180.00	-65.9	0.0	65.9	61.8	4.05	16.272	
300.0	300.0	300.0	300.0	2.1	2.1	180.00	-65.9	0.0	65.9	61.7	4.14	15.908	
400.0	400.0	400.0	400.0	2.1	2.1	180.00	-65.9	0.0	65.9	61.6	4.28	15.395	
500.0	500.0	500.0	500.0	2.2	2.2	180.00	-65.9	0.0	65.9	61.4	4.46	14.776	
600.0	600.0	600.0	600.0	2.3	2.3	180.00	-65.9	0.0	65.9	61.2	4.67	14.094	
700.0	700.0	700.0	700.0	2.5	2.5	180.00	-65.9	0.0	65.9	60.9	4.92	13.385	
800.0	800.0	800.0	800.0	2.6	2.6	180.00	-65.9	0.0	65.9	60.7	5.20	12.677	
900.0	900.0	900.0	900.0	2.7	2.7	180.00	-65.9	0.0	65.9	60.4	5.49	11.990	
1,000.0	1,000.0	1,000.0	1,000.0	2.9	2.9	180.00	-65.9	0.0	65.9	60.1	5.81	11.335	
1,100.0	1,100.0	1,100.0	1,100.0	3.1	3.1	180.00	-65.9	0.0	65.9	59.7	6.14	10.719	
1,200.0	1,200.0	1,200.0	1,200.0	3.2	3.2	180.00	-65.9	0.0	65.9	59.4	6.49	10.145	
1,300.0	1,300.0	1,300.0	1,300.0	3.4	3.4	180.00	-65.9	0.0	65.9	59.0	6.85	9.612	
1,400.0	1,400.0	1,400.0	1,400.0	3.6	3.6	180.00	-65.9	0.0	65.9	58.6	7.22	9.120	
1,500.0	1,500.0	1,500.0	1,500.0	3.8	3.8	180.00	-65.9	0.0	65.9	58.3	7.60	8.666	
1,600.0	1,600.0	1,600.0	1,600.0	4.0	4.0	180.00	-65.9	0.0	65.9	57.9	7.99	8.247	
1,700.0	1,700.0	1,700.0	1,700.0	4.2	4.2	180.00	-65.9	0.0	65.9	57.5	8.38	7.861	
1,800.0	1,800.0	1,800.0	1,800.0	4.4	4.4	180.00	-65.9	0.0	65.9	57.1	8.78	7.505	
1,900.0	1,900.0	1,900.0	1,900.0	4.6	4.6	180.00	-65.9	0.0	65.9	56.7	9.18	7.176	
2,000.0	2,000.0	2,000.0	2,000.0	4.8	4.8	180.00	-65.9	0.0	65.9	56.3	9.58	6.872	
2,100.0	2,100.0	2,100.0	2,100.0	5.0	5.0	180.00	-65.9	0.0	65.9	55.9	9.99	6.590	
2,200.0	2,200.0	2,200.0	2,200.0	5.2	5.2	180.00	-65.9	0.0	65.9	55.5	10.41	6.328	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 8T
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 8T	Survey Calculation Method:	Minimum Curvature
Well Error:	2.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Kline Federal 5300 31-18 8T	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
2,216.7	2,216.7	2,216.1	2,216.1	5.2	5.2	180.00	-65.9	0.0	66.0	55.5	10.47	6.303	
2,300.0	2,300.0	2,299.4	2,299.4	5.4	5.4	180.00	-66.7	0.0	67.5	56.7	10.77	6.261	
2,400.0	2,400.0	2,399.4	2,399.4	5.6	5.5	180.00	-67.5	0.0	69.2	58.1	11.14	6.210	
2,500.0	2,500.0	2,499.4	2,499.4	5.8	5.7	180.00	-68.4	0.0	70.9	59.4	11.52	6.159	
2,600.0	2,600.0	2,599.4	2,599.4	6.0	5.9	180.00	-69.3	0.0	72.7	60.8	11.90	6.109	
2,700.0	2,700.0	2,699.4	2,699.3	6.3	6.0	180.00	-70.1	0.0	74.4	62.2	12.28	6.060	
2,800.0	2,800.0	2,799.3	2,799.3	6.5	6.2	180.00	-71.0	0.0	76.2	63.5	12.67	6.012	
2,900.0	2,900.0	2,899.3	2,899.3	6.7	6.4	180.00	-71.9	0.0	77.9	64.9	13.06	5.965	
3,000.0	3,000.0	2,999.3	2,999.3	6.9	6.6	180.00	-72.8	0.0	79.7	66.2	13.46	5.919	
3,100.0	3,100.0	3,099.3	3,099.3	7.1	6.7	180.00	-73.6	0.0	81.4	67.6	13.86	5.875	
3,200.0	3,200.0	3,199.3	3,199.2	7.3	6.9	180.00	-74.5	0.0	83.2	68.9	14.26	5.831	
3,300.0	3,300.0	3,299.3	3,299.2	7.5	7.1	180.00	-75.4	0.0	84.9	70.2	14.67	5.789	
3,400.0	3,400.0	3,399.2	3,399.2	7.8	7.3	180.00	-76.3	0.0	86.7	71.6	15.07	5.749	
3,500.0	3,500.0	3,499.2	3,499.2	8.0	7.5	180.00	-77.1	0.0	88.4	72.9	15.48	5.709	
3,600.0	3,599.9	3,599.2	3,599.2	8.2	7.7	180.00	-78.0	0.0	90.1	74.3	15.90	5.671	
3,700.0	3,699.9	3,699.2	3,699.1	8.4	7.9	180.00	-78.9	0.0	91.9	75.6	16.31	5.634	
3,800.0	3,799.9	3,799.2	3,799.1	8.6	8.1	180.00	-79.7	0.0	93.6	76.9	16.73	5.598	
3,900.0	3,899.9	3,899.2	3,899.1	8.9	8.3	180.00	-80.6	0.0	95.4	78.2	17.14	5.564	
4,000.0	3,999.9	3,999.2	3,999.1	9.1	8.5	180.00	-81.5	0.0	97.1	79.6	17.56	5.530	
4,100.0	4,099.9	4,099.1	4,099.1	9.3	8.7	180.00	-82.4	0.0	98.9	80.9	17.98	5.498	
4,200.0	4,199.9	4,199.1	4,199.0	9.5	8.9	180.00	-83.2	0.0	100.6	82.2	18.41	5.467	
4,300.0	4,299.9	4,299.1	4,299.0	9.7	9.1	180.00	-84.1	0.0	102.4	83.5	18.83	5.437	
4,400.0	4,399.9	4,399.1	4,399.0	10.0	9.3	180.00	-85.0	0.0	104.1	84.9	19.25	5.407	
4,500.0	4,499.9	4,499.1	4,499.0	10.2	9.5	180.00	-85.9	0.0	105.9	86.2	19.68	5.379	
4,600.0	4,599.9	4,599.1	4,599.0	10.4	9.7	180.00	-86.7	0.0	107.6	87.5	20.11	5.352	
4,700.0	4,699.9	4,699.0	4,699.0	10.6	9.9	180.00	-87.6	0.0	109.3	88.8	20.53	5.325	
4,800.0	4,799.9	4,799.0	4,798.9	10.8	10.1	180.00	-88.5	0.0	111.1	90.1	20.96	5.300	
4,900.0	4,899.9	4,899.0	4,898.9	11.1	10.3	180.00	-89.3	0.0	112.8	91.4	21.39	5.275	
5,000.0	4,999.9	4,999.0	4,998.9	11.3	10.6	180.00	-90.2	0.0	114.6	92.8	21.82	5.251	
5,100.0	5,099.9	5,099.0	5,098.9	11.5	10.8	180.00	-91.1	0.0	116.3	94.1	22.25	5.227	
5,200.0	5,199.9	5,199.0	5,198.9	11.7	11.0	180.00	-92.0	0.0	118.1	95.4	22.68	5.205	
5,300.0	5,299.9	5,299.0	5,298.8	11.9	11.2	180.00	-92.8	0.0	119.8	96.7	23.12	5.183	
5,400.0	5,399.9	5,398.9	5,398.8	12.2	11.4	180.00	-93.7	0.0	121.6	98.0	23.55	5.162	
5,500.0	5,499.9	5,498.9	5,498.8	12.4	11.6	180.00	-94.6	0.0	123.3	99.3	23.98	5.141	
5,600.0	5,599.9	5,598.9	5,598.8	12.6	11.8	180.00	-95.4	0.0	125.1	100.6	24.42	5.121	
5,700.0	5,699.9	5,698.9	5,698.8	12.8	12.0	180.00	-96.3	0.0	126.8	101.9	24.85	5.102	
5,800.0	5,799.9	5,798.9	5,798.7	13.1	12.3	180.00	-97.2	0.0	128.5	103.3	25.29	5.083	
5,900.0	5,899.9	5,898.9	5,898.7	13.3	12.5	180.00	-98.1	0.0	130.3	104.6	25.72	5.065	
6,000.0	5,999.9	5,998.8	5,998.7	13.5	12.7	180.00	-98.9	0.0	132.0	105.9	26.16	5.047	
6,100.0	6,099.9	6,098.8	6,098.7	13.7	12.9	180.00	-99.8	0.0	133.8	107.2	26.60	5.030	
6,200.0	6,199.8	6,198.8	6,198.7	13.9	13.1	180.00	-100.7	0.0	135.5	108.5	27.04	5.013	
6,300.0	6,299.8	6,298.8	6,298.6	14.2	13.3	180.00	-101.6	0.0	137.3	109.8	27.47	4.996	
6,400.0	6,399.8	6,398.8	6,398.6	14.4	13.6	180.00	-102.4	0.0	139.0	111.1	27.91	4.981	
6,500.0	6,499.8	6,498.8	6,498.6	14.6	13.8	180.00	-103.3	0.0	140.8	112.4	28.35	4.965	
6,600.0	6,599.8	6,598.8	6,598.6	14.8	14.0	180.00	-104.2	0.0	142.5	113.7	28.79	4.950	
6,700.0	6,699.8	6,698.7	6,698.6	15.1	14.2	180.00	-105.0	0.0	144.2	115.0	29.23	4.935	
6,800.0	6,799.8	6,798.7	6,798.6	15.3	14.4	180.00	-105.9	0.0	146.0	116.3	29.67	4.921	
6,900.0	6,899.8	6,898.7	6,898.5	15.5	14.6	180.00	-106.8	0.0	147.7	117.6	30.11	4.907	
7,000.0	6,999.8	6,998.7	6,998.5	15.7	14.9	180.00	-107.7	0.0	149.5	118.9	30.55	4.894	
7,100.0	7,099.8	7,098.7	7,098.5	15.9	15.1	180.00	-108.5	0.0	151.2	120.2	30.99	4.880	
7,200.0	7,199.8	7,198.7	7,198.5	16.2	15.3	180.00	-109.4	0.0	153.0	121.5	31.43	4.868	
7,300.0	7,299.8	7,298.6	7,298.5	16.4	15.5	180.00	-110.3	0.0	154.7	122.9	31.87	4.855	

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 8T
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 8T	Survey Calculation Method:	Minimum Curvature
Well Error:	2.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Kline Federal 5300 31-18 8T	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
7,400.0	7,399.8	7,398.6	7,398.4	16.6	15.7	180.00	-111.2	0.0	156.5	124.2	32.31	4.843	
7,500.0	7,499.8	7,498.6	7,498.4	16.8	16.0	180.00	-112.0	0.0	158.2	125.5	32.75	4.831	
7,600.0	7,599.8	7,598.6	7,598.4	17.1	16.2	180.00	-112.9	0.0	160.0	126.8	33.19	4.819	
7,700.0	7,699.8	7,698.6	7,698.4	17.3	16.4	180.00	-113.8	0.0	161.7	128.1	33.63	4.808	
7,800.0	7,799.8	7,798.6	7,798.4	17.5	16.6	180.00	-114.6	0.0	163.4	129.4	34.08	4.796	
7,900.0	7,899.8	7,898.6	7,898.3	17.7	16.8	180.00	-115.5	0.0	165.2	130.7	34.52	4.786	
7,926.7	7,926.4	7,925.2	7,925.0	17.8	16.9	180.00	-115.7	0.0	165.7	131.0	34.64	4.783	
7,943.3	7,943.1	7,943.3	7,943.1	17.8	16.9	180.00	-115.8	0.0	165.8	131.1	34.74	4.773	
8,000.0	7,999.8	8,000.0	7,999.8	17.9	17.1	180.00	-115.8	0.0	165.8	130.8	34.96	4.742	
8,100.0	8,099.8	8,100.0	8,099.8	18.2	17.2	180.00	-115.8	0.0	165.8	130.4	35.38	4.687	
8,200.0	8,199.8	8,200.0	8,199.8	18.4	17.4	180.00	-115.8	0.0	165.8	130.0	35.79	4.633	
8,300.0	8,299.8	8,300.0	8,299.8	18.6	17.6	180.00	-115.8	0.0	165.8	129.6	36.21	4.580	
8,400.0	8,399.8	8,400.0	8,399.8	18.8	17.8	180.00	-115.8	0.0	165.8	129.2	36.62	4.528	
8,500.0	8,499.8	8,500.0	8,499.8	19.1	18.0	180.00	-115.8	0.0	165.8	128.8	37.04	4.477	
8,600.0	8,599.8	8,600.0	8,599.8	19.3	18.2	180.00	-115.8	0.0	165.8	128.4	37.45	4.427	
8,700.0	8,699.8	8,700.0	8,699.8	19.5	18.4	180.00	-115.8	0.0	165.8	127.9	37.87	4.378	
8,800.0	8,799.8	8,800.0	8,799.8	19.7	18.6	180.00	-115.8	0.0	165.8	127.5	38.29	4.330	
8,900.0	8,899.8	8,900.0	8,899.8	19.9	18.8	180.00	-115.8	0.0	165.8	127.1	38.71	4.283	
9,000.0	8,999.8	9,000.0	8,999.8	20.2	19.0	180.00	-115.8	0.0	165.8	126.7	39.13	4.237	
9,100.0	9,099.8	9,100.0	9,099.8	20.4	19.2	180.00	-115.8	0.0	165.8	126.3	39.55	4.192	
9,200.0	9,199.8	9,200.0	9,199.8	20.6	19.4	180.00	-115.8	0.0	165.8	125.8	39.97	4.148	
9,300.0	9,299.8	9,300.0	9,299.8	20.8	19.6	180.00	-115.8	0.0	165.8	125.4	40.39	4.105	
9,400.0	9,399.8	9,400.0	9,399.8	21.1	19.8	180.00	-115.8	0.0	165.8	125.0	40.82	4.062	
9,500.0	9,499.8	9,500.0	9,499.8	21.3	20.0	180.00	-115.8	0.0	165.8	124.6	41.24	4.021	
9,600.0	9,599.8	9,600.0	9,599.8	21.5	20.2	180.00	-115.8	0.0	165.8	124.1	41.66	3.980	
9,700.0	9,699.8	9,700.0	9,699.8	21.7	20.4	180.00	-115.8	0.0	165.8	123.7	42.09	3.940	
9,800.0	9,799.8	9,800.0	9,799.8	22.0	20.6	180.00	-115.8	0.0	165.8	123.3	42.51	3.900	
9,900.0	9,899.8	9,900.0	9,899.8	22.2	20.8	180.00	-115.8	0.0	165.8	122.9	42.94	3.862	
10,000.0	9,999.8	10,000.0	9,999.8	22.4	21.0	180.00	-115.8	0.0	165.8	122.4	43.36	3.824	
10,100.0	10,099.8	10,100.0	10,099.8	22.6	21.2	180.00	-115.8	0.0	165.8	122.0	43.79	3.786	
10,200.0	10,199.8	10,200.0	10,199.8	22.9	21.4	180.00	-115.8	0.0	165.8	121.6	44.22	3.750	
10,200.4	10,200.2	10,200.4	10,200.2	22.9	21.4	180.00	-115.8	0.0	165.8	121.6	44.22	3.750	
10,287.8	10,287.6	10,278.7	10,278.3	23.1	21.6	179.24	-117.2	2.2	167.4	122.8	44.58	3.756	
10,300.0	10,299.8	10,288.9	10,288.5	23.1	21.6	69.36	-117.8	3.2	168.1	123.5	44.62	3.768	
10,325.0	10,324.7	10,309.8	10,309.2	23.1	21.6	68.65	-119.4	5.9	169.6	124.9	44.70	3.795	
10,350.0	10,349.6	10,330.6	10,329.6	23.2	21.7	68.02	-121.4	9.3	171.3	126.5	44.76	3.827	
10,375.0	10,374.3	10,350.0	10,348.5	23.2	21.7	67.49	-123.7	13.1	173.1	128.3	44.81	3.862	
10,400.0	10,398.8	10,372.0	10,369.7	23.3	21.8	67.00	-126.8	18.3	175.0	130.1	44.85	3.901	
10,425.0	10,422.9	10,392.7	10,389.2	23.3	21.8	66.61	-130.2	23.9	176.9	132.1	44.88	3.943	
10,450.0	10,446.7	10,413.2	10,408.5	23.4	21.9	66.30	-134.0	30.1	179.0	134.1	44.89	3.988	
10,475.0	10,470.0	10,433.8	10,427.3	23.4	21.9	66.07	-138.2	37.1	181.2	136.3	44.90	4.036	
10,500.0	10,492.9	10,454.2	10,445.7	23.5	22.0	65.91	-142.8	44.7	183.4	138.5	44.89	4.086	
10,525.0	10,515.1	10,475.0	10,464.0	23.6	22.0	65.82	-147.9	53.2	185.7	140.9	44.88	4.139	
10,550.0	10,536.8	10,495.1	10,481.2	23.6	22.1	65.79	-153.1	62.0	188.1	143.3	44.87	4.193	
10,575.0	10,557.8	10,515.4	10,498.3	23.7	22.1	65.83	-158.9	71.5	190.6	145.7	44.86	4.248	
10,600.0	10,578.0	10,535.8	10,514.8	23.8	22.2	65.94	-165.0	81.7	193.1	148.2	44.86	4.303	
10,625.0	10,597.4	10,556.1	10,530.8	23.8	22.3	66.10	-171.5	92.4	195.6	150.8	44.88	4.359	
10,650.0	10,616.0	10,575.0	10,545.2	23.9	22.3	66.27	-177.8	102.9	198.3	153.4	44.91	4.415	
10,675.0	10,633.7	10,596.7	10,561.1	24.0	22.4	66.58	-185.4	115.5	200.9	156.0	44.97	4.468	
10,700.0	10,650.5	10,617.0	10,575.4	24.2	22.5	66.89	-192.8	127.9	203.7	158.6	45.06	4.521	
10,725.0	10,666.2	10,637.3	10,589.0	24.3	22.6	67.25	-200.6	140.8	206.5	161.3	45.18	4.571	
10,750.0	10,680.9	10,657.6	10,602.0	24.4	22.7	67.65	-208.6	154.2	209.4	164.0	45.33	4.618	

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 8T
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 8T	Survey Calculation Method:	Minimum Curvature
Well Error:	2.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Kline Federal 5300 31-18 8T	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
10,775.0	10,694.5	10,677.9	10,614.3	24.6	22.8	68.08	-217.0	168.0	212.3	166.8	45.53	4.663	
10,800.0	10,707.0	10,700.0	10,626.9	24.7	23.0	68.63	-226.3	183.5	215.3	169.5	45.79	4.702	
10,825.0	10,718.4	10,718.7	10,636.9	24.9	23.1	69.06	-234.5	197.0	218.3	172.3	46.05	4.741	
10,850.0	10,728.6	10,739.1	10,647.1	25.1	23.2	69.59	-243.6	212.2	221.5	175.1	46.39	4.774	
10,875.0	10,737.6	10,759.6	10,656.6	25.4	23.4	70.15	-253.0	227.8	224.6	177.9	46.77	4.803	
10,900.0	10,745.3	10,780.1	10,665.3	25.6	23.6	70.73	-262.6	243.7	227.9	180.7	47.19	4.829	
10,925.0	10,751.8	10,800.0	10,673.0	25.8	23.8	71.30	-272.0	259.4	231.2	183.6	47.65	4.852	
10,950.0	10,757.0	10,821.5	10,680.4	26.1	24.0	71.95	-282.4	276.7	234.6	186.4	48.18	4.869	
10,975.0	10,760.9	10,842.2	10,686.7	26.4	24.2	72.59	-292.6	293.7	238.1	189.3	48.74	4.884	
11,000.0	10,763.6	10,863.1	10,692.1	26.7	24.4	73.24	-303.0	310.9	241.6	192.2	49.33	4.897	
11,025.0	10,764.9	10,884.1	10,696.7	27.0	24.6	73.90	-313.6	328.5	245.2	195.2	49.97	4.907	
11,035.3	10,765.0	10,892.8	10,698.3	27.1	24.7	74.18	-318.0	335.8	246.7	196.4	50.24	4.910	
11,100.0	10,765.4	10,948.2	10,705.1	28.0	25.4	76.25	-346.4	382.9	258.0	205.9	52.05	4.957	
11,200.0	10,765.9	11,048.3	10,706.2	29.6	26.8	77.43	-397.2	469.1	280.4	225.4	55.00	5.099	
11,300.0	10,766.4	11,156.4	10,706.4	31.3	28.6	78.33	-448.9	564.0	303.1	244.7	58.35	5.194	
11,400.0	10,767.0	11,265.5	10,706.6	33.3	30.5	79.10	-497.4	661.7	325.5	263.5	62.04	5.247	
11,500.0	10,767.5	11,375.7	10,706.8	35.3	32.7	79.75	-542.5	762.2	347.7	281.7	65.98	5.270	
11,600.0	10,768.0	11,486.9	10,707.0	37.5	35.1	80.32	-584.2	865.3	369.6	299.4	70.14	5.269	
11,700.0	10,768.6	11,599.3	10,707.2	39.8	37.6	80.82	-622.1	971.1	391.1	316.6	74.45	5.253	
11,800.0	10,769.1	11,712.7	10,707.4	42.1	40.2	81.26	-656.2	1,079.2	412.2	333.3	78.89	5.224	
11,900.0	10,769.6	11,827.2	10,707.6	44.5	43.0	81.64	-686.3	1,189.7	432.8	349.4	83.42	5.188	
12,000.0	10,770.1	11,942.8	10,707.8	46.9	45.8	81.98	-712.1	1,302.4	452.9	364.9	87.98	5.148	
12,010.3	10,770.2	11,954.8	10,707.8	47.1	46.1	82.02	-714.5	1,314.1	455.0	366.5	88.45	5.144	
12,100.0	10,770.7	12,059.8	10,708.0	49.4	48.7	82.30	-733.6	1,417.4	471.1	377.8	93.31	5.049	
12,200.0	10,771.2	12,178.4	10,708.2	51.9	51.7	82.52	-750.5	1,534.8	485.4	386.5	98.88	4.909	
12,300.0	10,771.7	12,298.3	10,708.4	54.4	54.8	82.66	-762.7	1,654.0	495.5	390.9	104.57	4.739	
12,400.0	10,772.2	12,418.9	10,708.6	57.0	57.9	82.72	-770.0	1,774.4	501.5	391.2	110.36	4.544	
12,500.0	10,772.8	12,538.3	10,708.8	59.7	60.9	82.70	-772.1	1,893.8	503.3	387.2	116.15	4.333	
12,600.0	10,773.3	12,638.3	10,709.0	62.3	63.5	82.66	-772.1	1,993.8	503.4	381.9	121.48	4.144	
12,700.0	10,773.8	12,738.3	10,709.2	65.0	66.1	82.63	-772.1	2,093.8	503.4	376.6	126.85	3.969	
12,800.0	10,774.3	12,838.3	10,709.4	67.7	68.7	82.59	-772.1	2,193.8	503.5	371.2	132.26	3.807	
12,900.0	10,774.9	12,938.3	10,709.5	70.4	71.4	82.55	-772.1	2,293.8	503.5	365.8	137.69	3.657	
13,000.0	10,775.4	13,038.3	10,709.7	73.1	74.0	82.51	-772.1	2,393.8	503.6	360.4	143.16	3.518	
13,100.0	10,775.9	13,138.3	10,709.9	75.9	76.7	82.47	-772.1	2,493.8	503.6	355.0	148.65	3.388	
13,200.0	10,776.4	13,238.3	10,710.1	78.7	79.4	82.43	-772.1	2,593.8	503.7	349.5	154.16	3.267	
13,300.0	10,776.9	13,338.3	10,710.2	81.4	82.2	82.39	-772.1	2,693.8	503.7	344.0	159.69	3.154	
13,400.0	10,777.5	13,438.3	10,710.4	84.2	84.9	82.35	-772.1	2,793.8	503.7	338.5	165.23	3.049	
13,500.0	10,778.0	13,538.3	10,710.6	87.0	87.7	82.31	-772.1	2,893.8	503.8	333.0	170.80	2.950	
13,600.0	10,778.5	13,638.3	10,710.8	89.8	90.4	82.27	-772.1	2,993.8	503.8	327.5	176.37	2.857	
13,700.0	10,779.0	13,738.3	10,710.9	92.6	93.2	82.23	-772.1	3,093.8	503.9	321.9	181.96	2.769	
13,800.0	10,779.6	13,838.3	10,711.1	95.4	96.0	82.19	-772.1	3,193.8	503.9	316.4	187.57	2.687	
13,900.0	10,780.1	13,938.3	10,711.3	98.3	98.8	82.15	-772.1	3,293.8	504.0	310.8	193.18	2.609	
14,000.0	10,780.6	14,038.3	10,711.5	101.1	101.6	82.11	-772.1	3,393.8	504.0	305.2	198.80	2.535	
14,100.0	10,781.1	14,138.3	10,711.6	103.9	104.4	82.07	-772.1	3,493.8	504.1	299.6	204.43	2.466	
14,200.0	10,781.7	14,238.3	10,711.8	106.8	107.2	82.04	-772.1	3,593.8	504.1	294.1	210.06	2.400	
14,300.0	10,782.2	14,338.3	10,712.0	109.6	110.0	82.00	-772.1	3,693.8	504.2	288.5	215.71	2.337	
14,400.0	10,782.7	14,438.3	10,712.2	112.5	112.8	81.96	-772.1	3,793.8	504.2	282.9	221.36	2.278	
14,500.0	10,783.2	14,538.3	10,712.3	115.3	115.7	81.92	-772.1	3,893.8	504.3	277.3	227.01	2.221	
14,600.0	10,783.8	14,638.3	10,712.5	118.2	118.5	81.88	-772.1	3,993.8	504.3	271.6	232.68	2.167	
14,700.0	10,784.3	14,738.3	10,712.7	121.1	121.3	81.84	-772.1	4,093.8	504.4	266.0	238.34	2.116	
14,800.0	10,784.8	14,838.3	10,712.9	123.9	124.2	81.80	-772.1	4,193.8	504.4	260.4	244.01	2.067	
14,900.0	10,785.3	14,938.3	10,713.0	126.8	127.0	81.76	-772.1	4,293.8	504.5	254.8	249.69	2.020	

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 8T
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 8T	Survey Calculation Method:	Minimum Curvature
Well Error:	2.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Kline Federal 5300 31-18 8T	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

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
15,000.0	10,785.8	15,038.3	10,713.2	129.7	129.9	81.72	-772.1	4,393.8	504.5	249.2	255.36	1.976	
15,100.0	10,786.4	15,138.3	10,713.4	132.5	132.7	81.68	-772.1	4,493.8	504.6	243.5	261.05	1.933	
15,200.0	10,786.9	15,238.3	10,713.6	135.4	135.6	81.64	-772.1	4,593.8	504.6	237.9	266.73	1.892	
15,300.0	10,787.4	15,338.3	10,713.7	138.3	138.5	81.60	-772.1	4,693.8	504.7	232.3	272.42	1.853	
15,400.0	10,787.9	15,438.3	10,713.9	141.2	141.3	81.56	-772.1	4,793.8	504.7	226.6	278.11	1.815	
15,500.0	10,788.5	15,538.3	10,714.1	144.0	144.2	81.52	-772.1	4,893.8	504.8	221.0	283.80	1.779	
15,600.0	10,789.0	15,638.3	10,714.2	146.9	147.1	81.49	-772.1	4,993.8	504.8	215.3	289.49	1.744	
15,700.0	10,789.5	15,738.3	10,714.4	149.8	149.9	81.45	-772.1	5,093.8	504.9	209.7	295.19	1.710	
15,800.0	10,790.0	15,838.3	10,714.6	152.7	152.8	81.41	-772.1	5,193.8	504.9	204.0	300.89	1.678	
15,900.0	10,790.6	15,938.3	10,714.8	155.6	155.7	81.37	-772.1	5,293.8	505.0	198.4	306.58	1.647	
16,000.0	10,791.1	16,038.3	10,714.9	158.5	158.6	81.33	-772.1	5,393.8	505.0	192.7	312.28	1.617	
16,100.0	10,791.6	16,138.3	10,715.1	161.4	161.4	81.29	-772.1	5,493.8	505.1	187.1	317.99	1.588	
16,200.0	10,792.1	16,238.3	10,715.3	164.3	164.3	81.25	-772.1	5,593.8	505.1	181.4	323.69	1.561	
16,300.0	10,792.7	16,338.3	10,715.5	167.2	167.2	81.21	-772.1	5,693.8	505.2	175.8	329.39	1.534	
16,400.0	10,793.2	16,438.3	10,715.6	170.1	170.1	81.17	-772.1	5,793.8	505.2	170.1	335.10	1.508	
16,500.0	10,793.7	16,538.3	10,715.8	173.0	173.0	81.13	-772.1	5,893.8	505.3	164.5	340.80	1.483	Level 3Level 3
16,600.0	10,794.2	16,638.3	10,716.0	175.9	175.9	81.09	-772.1	5,993.8	505.4	158.8	346.51	1.458	Level 3Level 3
16,700.0	10,794.8	16,738.3	10,716.2	178.8	178.8	81.06	-772.1	6,093.8	505.4	153.2	352.21	1.435	Level 3Level 3
16,800.0	10,795.3	16,838.3	10,716.3	181.7	181.6	81.02	-772.1	6,193.8	505.5	147.5	357.92	1.412	Level 3Level 3
16,900.0	10,795.8	16,938.3	10,716.5	184.6	184.5	80.98	-772.1	6,293.8	505.5	141.9	363.62	1.390	Level 3Level 3
17,000.0	10,796.3	17,038.3	10,716.7	187.5	187.4	80.94	-772.1	6,393.8	505.6	136.2	369.33	1.369	Level 3Level 3
17,100.0	10,796.8	17,138.3	10,716.9	190.4	190.3	80.90	-772.1	6,493.8	505.6	130.6	375.04	1.348	Level 3Level 3
17,200.0	10,797.4	17,238.3	10,717.0	193.3	193.2	80.86	-772.1	6,593.8	505.7	124.9	380.74	1.328	Level 3Level 3
17,300.0	10,797.9	17,338.3	10,717.2	196.2	196.1	80.82	-772.1	6,693.8	505.7	119.3	386.45	1.309	Level 3Level 3
17,400.0	10,798.4	17,438.3	10,717.4	199.1	199.0	80.78	-772.1	6,793.8	505.8	113.6	392.16	1.290	Level 3Level 3
17,500.0	10,798.9	17,538.3	10,717.6	202.0	201.9	80.74	-772.1	6,893.8	505.8	108.0	397.86	1.271	Level 3Level 3
17,600.0	10,799.5	17,638.3	10,717.7	204.9	204.8	80.70	-772.1	6,993.8	505.9	102.3	403.57	1.254	Level 3Level 3
17,700.0	10,800.0	17,738.3	10,717.9	207.8	207.7	80.66	-772.1	7,093.8	506.0	96.7	409.28	1.236	Level 2
17,800.0	10,800.5	17,838.3	10,718.1	210.7	210.6	80.63	-772.1	7,193.8	506.0	91.0	414.98	1.219	Level 2
17,900.0	10,801.0	17,938.3	10,718.3	213.6	213.5	80.59	-772.1	7,293.8	506.1	85.4	420.69	1.203	Level 2
18,000.0	10,801.6	18,038.3	10,718.4	216.5	216.4	80.55	-772.1	7,393.8	506.1	79.7	426.39	1.187	Level 2
18,100.0	10,802.1	18,138.3	10,718.6	219.5	219.3	80.51	-772.1	7,493.8	506.2	74.1	432.10	1.171	Level 2
18,200.0	10,802.6	18,238.3	10,718.8	222.4	222.2	80.47	-772.1	7,593.8	506.2	68.4	437.80	1.156	Level 2
18,300.0	10,803.1	18,338.3	10,719.0	225.3	225.1	80.43	-772.1	7,693.8	506.3	62.8	443.50	1.142	Level 2
18,400.0	10,803.7	18,438.3	10,719.1	228.2	228.0	80.39	-772.1	7,793.8	506.4	57.2	449.21	1.127	Level 2
18,500.0	10,804.2	18,538.3	10,719.3	231.1	231.0	80.35	-772.1	7,893.8	506.4	51.5	454.91	1.113	Level 2
18,600.0	10,804.7	18,638.3	10,719.5	234.0	233.9	80.31	-772.1	7,993.8	506.5	45.9	460.61	1.100	Level 2
18,700.0	10,805.2	18,738.3	10,719.7	236.9	236.8	80.28	-772.1	8,093.8	506.5	40.2	466.31	1.086	Level 2
18,800.0	10,805.7	18,838.3	10,719.8	239.8	239.7	80.24	-772.1	8,193.8	506.6	34.6	472.01	1.073	Level 2
18,900.0	10,806.3	18,938.3	10,720.0	242.8	242.6	80.20	-772.1	8,293.8	506.7	28.9	477.71	1.061	Level 2
19,000.0	10,806.8	19,038.3	10,720.2	245.7	245.5	80.16	-772.1	8,393.7	506.7	23.3	483.41	1.048	Level 2
19,100.0	10,807.3	19,138.3	10,720.4	248.6	248.4	80.12	-772.1	8,493.7	506.8	17.7	489.11	1.036	Level 2
19,200.0	10,807.8	19,238.3	10,720.5	251.5	251.3	80.08	-772.1	8,593.7	506.8	12.0	494.81	1.024	Level 2
19,300.0	10,808.4	19,338.3	10,720.7	254.4	254.2	80.04	-772.1	8,693.7	506.9	6.4	500.50	1.013	Level 2
19,400.0	10,808.9	19,438.3	10,720.9	257.3	257.1	80.00	-772.1	8,793.7	507.0	0.8	506.20	1.002	Level 2
19,500.0	10,809.4	19,538.3	10,721.1	260.2	260.1	79.96	-772.1	8,893.7	507.0	-4.9	511.89	0.990	Level 1
19,600.0	10,809.9	19,638.3	10,721.2	263.2	263.0	79.93	-772.1	8,993.7	507.1	-10.5	517.58	0.980	Level 1
19,700.0	10,810.5	19,738.3	10,721.4	266.1	265.9	79.89	-772.1	9,093.7	507.1	-16.1	523.28	0.969	Level 1
19,800.0	10,811.0	19,838.3	10,721.6	269.0	268.8	79.85	-772.1	9,193.7	507.2	-21.8	528.97	0.959	Level 1
19,900.0	10,811.5	19,938.3	10,721.8	271.9	271.7	79.81	-772.1	9,293.7	507.3	-27.4	534.66	0.949	Level 1
20,000.0	10,812.0	20,038.3	10,721.9	274.8	274.6	79.77	-772.1	9,393.7	507.3	-33.0	540.35	0.939	Level 1
20,100.0	10,812.6	20,138.3	10,722.1	277.8	277.5	79.73	-772.1	9,493.7	507.4	-38.6	546.03	0.929	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 8T
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 8T	Survey Calculation Method:	Minimum Curvature
Well Error:	2.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Kline Federal 5300 31-18 8T	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
20,200.0	10,813.1	20,238.3	10,722.3	280.7	280.4	79.69	-772.1	9,593.7	507.4	-44.3	551.72	0.920	Level 1
20,300.0	10,813.6	20,338.3	10,722.5	283.6	283.4	79.65	-772.1	9,693.7	507.5	-49.9	557.41	0.910	Level 1
20,400.0	10,814.1	20,438.3	10,722.6	286.5	286.3	79.61	-772.1	9,793.7	507.6	-55.5	563.09	0.901	Level 1
20,500.0	10,814.6	20,538.3	10,722.8	289.4	289.2	79.58	-772.1	9,893.7	507.6	-61.1	568.78	0.893	Level 1
20,600.0	10,815.2	20,638.3	10,723.0	292.4	292.1	79.54	-772.1	9,993.7	507.7	-66.8	574.46	0.884	Level 1
20,656.4	10,815.5	20,694.5	10,723.1	294.0	293.8	79.52	-772.1	10,050.0	507.7	-69.9	577.66	0.879	Level 1, ES, SF

Company:	Oasis	Local Co-ordinate Reference:	Well Kline Federal 5300 31-18 8T
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 8T	Survey Calculation Method:	Minimum Curvature
Well Error:	2.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Kline Federal 5300 31-18 8T	Database:	EDM_new
Reference Design:	Design #1	Offset TVD Reference:	Offset Datum

Offset Design 153N-100W-17/18 - Kline Federal 5300 31-18 7T2 - Kline Federal 5300 31-18 7T2 - 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	180.00	-32.4	0.0	32.4				
100.0	100.0	100.0	100.0	2.0	2.0	180.00	-32.4	0.0	32.4	28.4	4.00	8.098	
200.0	200.0	200.0	200.0	2.0	2.0	180.00	-32.4	0.0	32.4	28.4	4.05	8.010	
300.0	300.0	300.0	300.0	2.1	2.1	180.00	-32.4	0.0	32.4	28.3	4.14	7.831	
400.0	400.0	400.0	400.0	2.1	2.1	180.00	-32.4	0.0	32.4	28.1	4.28	7.578	
500.0	500.0	500.0	500.0	2.2	2.2	180.00	-32.4	0.0	32.4	28.0	4.46	7.274	
600.0	600.0	600.0	600.0	2.3	2.3	180.00	-32.4	0.0	32.4	27.7	4.67	6.938	
700.0	700.0	700.0	700.0	2.5	2.5	180.00	-32.4	0.0	32.4	27.5	4.92	6.589	
800.0	800.0	800.0	800.0	2.6	2.6	180.00	-32.4	0.0	32.4	27.2	5.20	6.240	
900.0	900.0	900.0	900.0	2.7	2.7	180.00	-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	180.00	-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	180.00	-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	180.00	-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	180.00	-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	180.00	-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	180.00	-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	180.00	-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	180.00	-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	180.00	-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	180.00	-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	180.00	-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	180.00	-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	180.00	-32.4	0.0	32.4	22.0	10.41	3.115	CC
2,216.7	2,216.7	2,216.7	2,216.7	5.2	5.2	180.00	-32.4	0.0	32.5	22.0	10.48	3.101	
2,300.0	2,300.0	2,300.0	2,300.0	5.4	5.4	180.00	-32.4	0.0	33.2	22.4	10.82	3.069	
2,400.0	2,400.0	2,400.0	2,400.0	5.6	5.6	180.00	-32.4	0.0	34.1	22.9	11.24	3.032	
2,500.0	2,500.0	2,500.0	2,500.0	5.8	5.8	180.00	-32.4	0.0	35.0	23.3	11.66	2.998	
2,600.0	2,600.0	2,600.0	2,600.0	6.0	6.0	180.00	-32.4	0.0	35.8	23.8	12.09	2.965	
2,700.0	2,700.0	2,700.0	2,700.0	6.3	6.3	180.00	-32.4	0.0	36.7	24.2	12.51	2.934	
2,800.0	2,800.0	2,800.0	2,800.0	6.5	6.5	180.00	-32.4	0.0	37.6	24.6	12.94	2.905	
2,900.0	2,900.0	2,900.0	2,900.0	6.7	6.7	180.00	-32.4	0.0	38.5	25.1	13.37	2.877	
3,000.0	3,000.0	3,000.0	3,000.0	6.9	6.9	180.00	-32.4	0.0	39.3	25.5	13.80	2.851	
3,100.0	3,100.0	3,100.0	3,100.0	7.1	7.1	180.00	-32.4	0.0	40.2	26.0	14.23	2.826	
3,200.0	3,200.0	3,200.0	3,200.0	7.3	7.3	180.00	-32.4	0.0	41.1	26.4	14.66	2.802	
3,300.0	3,300.0	3,300.0	3,300.0	7.5	7.5	180.00	-32.4	0.0	41.9	26.9	15.09	2.779	
3,400.0	3,400.0	3,400.0	3,400.0	7.8	7.8	180.00	-32.4	0.0	42.8	27.3	15.53	2.758	
3,500.0	3,500.0	3,500.0	3,500.0	8.0	8.0	180.00	-32.4	0.0	43.7	27.7	15.96	2.737	
3,600.0	3,599.9	3,599.9	3,599.9	8.2	8.2	180.00	-32.4	0.0	44.6	28.2	16.40	2.718	
3,700.0	3,699.9	3,699.9	3,699.9	8.4	8.4	180.00	-32.4	0.0	45.4	28.6	16.83	2.699	
3,800.0	3,799.9	3,799.9	3,799.9	8.6	8.6	180.00	-32.4	0.0	46.3	29.0	17.27	2.681	
3,900.0	3,899.9	3,899.9	3,899.9	8.9	8.9	180.00	-32.4	0.0	47.2	29.5	17.71	2.664	
4,000.0	3,999.9	3,999.9	3,999.9	9.1	9.1	180.00	-32.4	0.0	48.1	29.9	18.15	2.648	
4,100.0	4,099.9	4,099.9	4,099.9	9.3	9.3	180.00	-32.4	0.0	48.9	30.3	18.59	2.633	
4,200.0	4,199.9	4,199.9	4,199.9	9.5	9.5	180.00	-32.4	0.0	49.8	30.8	19.02	2.618	
4,300.0	4,299.9	4,299.9	4,299.9	9.7	9.7	180.00	-32.4	0.0	50.7	31.2	19.46	2.603	
4,400.0	4,399.9	4,399.9	4,399.9	10.0	10.0	180.00	-32.4	0.0	51.5	31.6	19.90	2.590	
4,500.0	4,499.9	4,499.9	4,499.9	10.2	10.2	180.00	-32.4	0.0	52.4	32.1	20.35	2.576	
4,600.0	4,599.9	4,599.9	4,599.9	10.4	10.4	180.00	-32.4	0.0	53.3	32.5	20.79	2.564	
4,700.0	4,699.9	4,699.9	4,699.9	10.6	10.6	180.00	-32.4	0.0	54.2	32.9	21.23	2.552	
4,800.0	4,799.9	4,799.9	4,799.9	10.8	10.8	180.00	-32.4	0.0	55.0	33.4	21.67	2.540	
4,900.0	4,899.9	4,899.9	4,899.9	11.1	11.1	180.00	-32.4	0.0	55.9	33.8	22.11	2.529	
5,000.0	4,999.9	4,999.9	4,999.9	11.3	11.3	180.00	-32.4	0.0	56.8	34.2	22.55	2.518	

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 8T
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 8T	Survey Calculation Method:	Minimum Curvature
Well Error:	2.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Kline Federal 5300 31-18 8T	Database:	EDM_new
Reference Design:	Design #1	Offset TVD Reference:	Offset Datum

Offset Design 153N-100W-17/18 - Kline Federal 5300 31-18 7T2 - Kline Federal 5300 31-18 7T2 - 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
5,100.0	5,099.9	5,099.9	5,099.9	11.5	11.5	180.00	-32.4	0.0	57.7	34.7	23.00	2.507	
5,200.0	5,199.9	5,199.9	5,199.9	11.7	11.7	180.00	-32.4	0.0	58.5	35.1	23.44	2.497	
5,300.0	5,299.9	5,299.9	5,299.9	11.9	11.9	180.00	-32.4	0.0	59.4	35.5	23.88	2.487	
5,400.0	5,399.9	5,399.9	5,399.9	12.2	12.2	180.00	-32.4	0.0	60.3	35.9	24.33	2.478	
5,500.0	5,499.9	5,499.9	5,499.9	12.4	12.4	180.00	-32.4	0.0	61.1	36.4	24.77	2.469	
5,600.0	5,599.9	5,599.9	5,599.9	12.6	12.6	180.00	-32.4	0.0	62.0	36.8	25.21	2.460	
5,700.0	5,699.9	5,699.9	5,699.9	12.8	12.8	180.00	-32.4	0.0	62.9	37.2	25.66	2.451	
5,800.0	5,799.9	5,799.9	5,799.9	13.1	13.0	180.00	-32.4	0.0	63.8	37.7	26.10	2.443	
5,900.0	5,899.9	5,899.9	5,899.9	13.3	13.3	180.00	-32.4	0.0	64.6	38.1	26.55	2.435	
6,000.0	5,999.9	5,999.9	5,999.9	13.5	13.5	180.00	-32.4	0.0	65.5	38.5	26.99	2.427	
6,100.0	6,099.9	6,099.9	6,099.9	13.7	13.7	180.00	-32.4	0.0	66.4	38.9	27.43	2.420	
6,200.0	6,199.8	6,199.8	6,199.8	13.9	13.9	180.00	-32.4	0.0	67.3	39.4	27.88	2.412	
6,300.0	6,299.8	6,299.8	6,299.8	14.2	14.2	180.00	-32.4	0.0	68.1	39.8	28.32	2.405	
6,400.0	6,399.8	6,399.8	6,399.8	14.4	14.4	180.00	-32.4	0.0	69.0	40.2	28.77	2.398	
6,500.0	6,499.8	6,499.8	6,499.8	14.6	14.6	180.00	-32.4	0.0	69.9	40.7	29.22	2.392	
6,600.0	6,599.8	6,599.8	6,599.8	14.8	14.8	180.00	-32.4	0.0	70.7	41.1	29.66	2.385	
6,700.0	6,699.8	6,699.8	6,699.8	15.1	15.1	180.00	-32.4	0.0	71.6	41.5	30.11	2.379	
6,800.0	6,799.8	6,799.8	6,799.8	15.3	15.3	180.00	-32.4	0.0	72.5	41.9	30.55	2.373	
6,900.0	6,899.8	6,899.8	6,899.8	15.5	15.5	180.00	-32.4	0.0	73.4	42.4	31.00	2.367	
7,000.0	6,999.8	6,999.8	6,999.8	15.7	15.7	180.00	-32.4	0.0	74.2	42.8	31.44	2.361	
7,100.0	7,099.8	7,099.8	7,099.8	15.9	15.9	180.00	-32.4	0.0	75.1	43.2	31.89	2.355	
7,200.0	7,199.8	7,199.8	7,199.8	16.2	16.2	180.00	-32.4	0.0	76.0	43.6	32.34	2.350	
7,300.0	7,299.8	7,299.8	7,299.8	16.4	16.4	180.00	-32.4	0.0	76.9	44.1	32.78	2.344	
7,400.0	7,399.8	7,399.8	7,399.8	16.6	16.6	180.00	-32.4	0.0	77.7	44.5	33.23	2.339	
7,500.0	7,499.8	7,499.8	7,499.8	16.8	16.8	180.00	-32.4	0.0	78.6	44.9	33.67	2.334	
7,600.0	7,599.8	7,599.8	7,599.8	17.1	17.1	180.00	-32.4	0.0	79.5	45.4	34.12	2.329	
7,700.0	7,699.8	7,699.8	7,699.8	17.3	17.3	180.00	-32.4	0.0	80.3	45.8	34.57	2.324	
7,800.0	7,799.8	7,799.8	7,799.8	17.5	17.5	180.00	-32.4	0.0	81.2	46.2	35.01	2.320	
7,900.0	7,899.8	7,899.8	7,899.8	17.7	17.7	180.00	-32.4	0.0	82.1	46.6	35.46	2.315	
7,926.7	7,926.4	7,926.4	7,926.4	17.8	17.8	180.00	-32.4	0.0	82.3	46.7	35.58	2.314	
7,943.3	7,943.1	7,943.1	7,943.1	17.8	17.8	180.00	-32.4	0.0	82.4	46.8	35.63	2.312	
8,000.0	7,999.8	7,999.8	7,999.8	17.9	18.0	180.00	-32.4	0.0	82.4	46.5	35.87	2.297	
8,100.0	8,099.8	8,099.8	8,099.8	18.2	18.2	180.00	-32.4	0.0	82.4	46.1	36.32	2.269	
8,200.0	8,199.8	8,199.8	8,199.8	18.4	18.4	180.00	-32.4	0.0	82.4	45.6	36.76	2.241	
8,300.0	8,299.8	8,299.8	8,299.8	18.6	18.6	180.00	-32.4	0.0	82.4	45.2	37.21	2.214	
8,400.0	8,399.8	8,399.8	8,399.8	18.8	18.8	180.00	-32.4	0.0	82.4	44.7	37.66	2.188	
8,500.0	8,499.8	8,499.8	8,499.8	19.1	19.1	180.00	-32.4	0.0	82.4	44.3	38.10	2.162	
8,600.0	8,599.8	8,599.8	8,599.8	19.3	19.3	180.00	-32.4	0.0	82.4	43.8	38.55	2.137	
8,700.0	8,699.8	8,699.8	8,699.8	19.5	19.5	180.00	-32.4	0.0	82.4	43.4	39.00	2.113	
8,800.0	8,799.8	8,799.8	8,799.8	19.7	19.7	180.00	-32.4	0.0	82.4	43.0	39.44	2.089	
8,900.0	8,899.8	8,899.8	8,899.8	19.9	20.0	180.00	-32.4	0.0	82.4	42.5	39.89	2.066	
9,000.0	8,999.8	8,999.8	8,999.8	20.2	20.2	180.00	-32.4	0.0	82.4	42.1	40.34	2.043	
9,100.0	9,099.8	9,099.8	9,099.8	20.4	20.4	180.00	-32.4	0.0	82.4	41.6	40.78	2.020	
9,200.0	9,199.8	9,199.8	9,199.8	20.6	20.6	180.00	-32.4	0.0	82.4	41.2	41.23	1.998	
9,300.0	9,299.8	9,299.8	9,299.8	20.8	20.9	180.00	-32.4	0.0	82.4	40.7	41.68	1.977	
9,400.0	9,399.8	9,399.8	9,399.8	21.1	21.1	180.00	-32.4	0.0	82.4	40.3	42.13	1.956	
9,500.0	9,499.8	9,499.8	9,499.8	21.3	21.3	180.00	-32.4	0.0	82.4	39.8	42.57	1.935	
9,600.0	9,599.8	9,599.8	9,599.8	21.5	21.5	180.00	-32.4	0.0	82.4	39.4	43.02	1.915	
9,700.0	9,699.8	9,699.8	9,699.8	21.7	21.8	180.00	-32.4	0.0	82.4	38.9	43.47	1.896	
9,800.0	9,799.8	9,799.8	9,799.8	22.0	22.0	180.00	-32.4	0.0	82.4	38.5	43.92	1.876	
9,900.0	9,899.8	9,899.8	9,899.8	22.2	22.2	180.00	-32.4	0.0	82.4	38.0	44.36	1.857	
10,000.0	9,999.8	9,999.8	9,999.8	22.4	22.4	180.00	-32.4	0.0	82.4	37.6	44.81	1.839	

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 8T
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 8T	Survey Calculation Method:	Minimum Curvature
Well Error:	2.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Kline Federal 5300 31-18 8T	Database:	EDM_new
Reference Design:	Design #1	Offset TVD Reference:	Offset Datum

Offset Design 153N-100W-17/18 - Kline Federal 5300 31-18 7T2 - Kline Federal 5300 31-18 7T2 - 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
10,100.0	10,099.8	10,099.8	10,099.8	22.6	22.6	180.00	-32.4	0.0	82.4	37.1	45.26	1.821	
10,200.0	10,199.8	10,199.8	10,199.8	22.9	22.9	180.00	-32.4	0.0	82.4	36.7	45.71	1.803	
10,287.8	10,287.6	10,287.6	10,287.6	23.1	23.1	180.00	-32.4	0.0	82.4	36.3	46.10	1.787	
10,300.0	10,299.8	10,299.8	10,299.8	23.1	23.1	70.61	-32.4	0.0	82.3	36.2	46.17	1.783	
10,325.0	10,324.7	10,324.7	10,324.7	23.1	23.2	71.51	-32.4	0.0	81.9	35.7	46.26	1.771	
10,350.0	10,349.6	10,348.5	10,348.5	23.2	23.2	73.12	-32.5	0.1	81.2	34.9	46.35	1.753	
10,375.0	10,374.3	10,371.4	10,371.3	23.2	23.2	74.89	-33.2	1.1	80.8	34.4	46.42	1.740	
10,395.1	10,394.0	10,389.8	10,389.7	23.3	23.3	76.40	-34.1	2.6	80.7	34.2	46.49	1.735	
10,400.0	10,398.8	10,394.4	10,394.2	23.3	23.3	76.78	-34.4	3.0	80.7	34.2	46.51	1.735	
10,425.0	10,422.9	10,417.5	10,417.1	23.3	23.3	78.75	-36.3	5.9	80.9	34.3	46.60	1.737	
10,450.0	10,446.7	10,440.7	10,439.8	23.4	23.4	80.79	-38.8	9.6	81.6	34.9	46.70	1.747	
10,475.0	10,470.0	10,464.0	10,462.4	23.4	23.4	82.87	-41.9	14.3	82.6	35.8	46.81	1.764	
10,500.0	10,492.9	10,487.4	10,484.8	23.5	23.5	84.94	-45.7	20.0	84.0	37.1	46.93	1.790	
10,525.0	10,515.1	10,510.8	10,506.9	23.6	23.5	86.98	-50.0	26.5	85.8	38.7	47.05	1.824	
10,550.0	10,536.8	10,534.4	10,528.7	23.6	23.6	88.96	-55.0	34.0	88.0	40.8	47.17	1.866	
10,575.0	10,557.8	10,558.1	10,550.1	23.7	23.6	90.85	-60.6	42.5	90.6	43.3	47.29	1.916	
10,600.0	10,578.0	10,581.9	10,571.1	23.8	23.7	92.63	-66.8	51.8	93.6	46.2	47.41	1.975	
10,625.0	10,597.4	10,605.8	10,591.6	23.8	23.7	94.29	-73.6	62.1	97.0	49.5	47.53	2.041	
10,650.0	10,616.0	10,629.8	10,611.5	23.9	23.8	95.82	-81.0	73.2	100.8	53.1	47.65	2.115	
10,675.0	10,633.7	10,653.9	10,630.8	24.0	23.9	97.20	-88.9	85.2	104.8	57.1	47.76	2.195	
10,700.0	10,650.5	10,678.1	10,649.5	24.2	24.0	98.44	-97.5	98.1	109.3	61.4	47.88	2.282	
10,725.0	10,666.2	10,702.5	10,667.4	24.3	24.0	99.54	-106.6	111.9	114.0	66.0	48.01	2.374	
10,750.0	10,680.9	10,726.9	10,684.5	24.4	24.1	100.50	-116.2	126.4	119.0	70.8	48.16	2.470	
10,775.0	10,694.5	10,751.5	10,700.8	24.6	24.3	101.32	-126.4	141.7	124.2	75.9	48.32	2.571	
10,800.0	10,707.0	10,776.3	10,716.3	24.7	24.4	102.02	-137.1	157.8	129.7	81.2	48.52	2.674	
10,825.0	10,718.4	10,801.1	10,730.8	24.9	24.5	102.60	-148.3	174.7	135.4	86.7	48.74	2.779	
10,850.0	10,728.6	10,826.1	10,744.2	25.1	24.7	103.06	-159.9	192.2	141.3	92.3	49.00	2.885	
10,875.0	10,737.6	10,851.3	10,756.7	25.4	24.8	103.42	-172.0	210.5	147.4	98.1	49.30	2.990	
10,900.0	10,745.3	10,876.6	10,768.0	25.6	25.0	103.68	-184.5	229.3	153.6	104.0	49.64	3.095	
10,925.0	10,751.8	10,902.1	10,778.2	25.8	25.2	103.86	-197.4	248.8	160.0	110.0	50.03	3.198	
10,950.0	10,757.0	10,927.8	10,787.2	26.1	25.4	103.95	-210.7	268.9	166.5	116.0	50.46	3.299	
10,975.0	10,760.9	10,953.6	10,794.9	26.4	25.6	103.96	-224.3	289.4	173.0	122.1	50.93	3.397	
11,000.0	10,763.6	10,979.7	10,801.3	26.7	25.9	103.91	-238.3	310.5	179.6	128.2	51.45	3.492	
11,025.0	10,764.9	11,005.9	10,806.3	27.0	26.2	103.80	-252.5	331.9	186.3	134.3	52.01	3.582	
11,035.3	10,765.0	11,016.8	10,808.0	27.1	26.3	103.74	-258.5	340.9	189.0	136.8	52.25	3.618	
11,100.0	10,765.4	11,085.8	10,813.0	28.0	27.1	103.91	-296.5	398.2	206.0	152.2	53.79	3.829	
11,200.0	10,765.9	11,190.0	10,813.3	29.6	28.5	102.31	-352.4	486.1	231.6	174.8	56.82	4.076	
11,300.0	10,766.4	11,295.4	10,813.7	31.3	30.2	101.04	-405.7	577.0	257.2	197.1	60.17	4.275	
11,400.0	10,767.0	11,401.8	10,814.1	33.3	32.1	100.00	-456.1	670.8	282.8	219.0	63.81	4.432	
11,500.0	10,767.5	11,509.4	10,814.5	35.3	34.2	99.15	-503.4	767.3	308.2	240.5	67.68	4.553	
11,600.0	10,768.0	11,618.2	10,814.9	37.5	36.4	98.43	-547.6	866.7	333.3	261.6	71.73	4.647	
11,700.0	10,768.6	11,728.1	10,815.3	39.8	38.8	97.81	-588.3	968.8	358.2	282.3	75.93	4.718	
11,800.0	10,769.1	11,839.2	10,815.7	42.1	41.4	97.29	-625.5	1,073.5	382.8	302.5	80.23	4.771	
11,900.0	10,769.6	11,951.6	10,816.1	44.5	44.0	96.83	-659.0	1,180.8	406.9	322.3	84.60	4.810	
12,000.0	10,770.1	12,065.2	10,816.5	46.9	46.7	96.43	-688.5	1,290.5	430.7	341.7	89.02	4.839	
12,010.3	10,770.2	12,077.0	10,816.5	47.1	47.0	96.39	-691.3	1,301.9	433.1	343.7	89.47	4.841	
12,100.0	10,770.7	12,180.4	10,816.9	49.4	49.6	96.05	-713.9	1,402.8	452.7	358.5	94.22	4.805	
12,200.0	10,771.2	12,297.5	10,817.3	51.9	52.5	95.75	-735.2	1,518.0	470.7	371.0	99.67	4.723	
12,300.0	10,771.7	12,416.3	10,817.8	54.4	55.5	95.53	-751.9	1,635.5	484.7	379.4	105.28	4.604	
12,400.0	10,772.2	12,536.2	10,818.2	57.0	58.5	95.37	-763.8	1,754.9	494.6	383.6	111.01	4.455	
12,500.0	10,772.8	12,656.9	10,818.6	59.7	61.6	95.27	-770.7	1,875.4	500.3	383.5	116.83	4.282	
12,600.0	10,773.3	12,775.1	10,819.0	62.3	64.6	95.23	-772.6	1,993.5	501.8	379.2	122.62	4.092	

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 8T
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 8T	Survey Calculation Method:	Minimum Curvature
Well Error:	2.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Kline Federal 5300 31-18 8T	Database:	EDM_new
Reference Design:	Design #1	Offset TVD Reference:	Offset Datum

Offset Design 153N-100W-17/18 - Kline Federal 5300 31-18 7T2 - Kline Federal 5300 31-18 7T2 - 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
12,700.0	10,773.8	12,875.1	10,819.4	65.0	67.1	95.21	-772.6	2,093.5	501.8	373.8	127.99	3.921	
12,800.0	10,774.3	12,975.1	10,819.7	67.7	69.7	95.19	-772.6	2,193.5	501.8	368.4	133.40	3.762	
12,900.0	10,774.9	13,075.1	10,820.1	70.4	72.3	95.17	-772.6	2,293.5	501.8	362.9	138.85	3.614	
13,000.0	10,775.4	13,175.1	10,820.4	73.1	74.9	95.15	-772.6	2,393.5	501.8	357.4	144.32	3.477	
13,100.0	10,775.9	13,275.1	10,820.8	75.9	77.6	95.13	-772.6	2,493.5	501.8	351.9	149.83	3.349	
13,200.0	10,776.4	13,375.1	10,821.1	78.7	80.3	95.11	-772.6	2,593.5	501.7	346.4	155.36	3.230	
13,300.0	10,776.9	13,475.1	10,821.5	81.4	83.0	95.09	-772.6	2,693.5	501.7	340.8	160.91	3.118	
13,400.0	10,777.5	13,575.1	10,821.8	84.2	85.7	95.07	-772.6	2,793.5	501.7	335.2	166.48	3.014	
13,500.0	10,778.0	13,675.1	10,822.2	87.0	88.4	95.05	-772.6	2,893.5	501.7	329.6	172.08	2.916	
13,600.0	10,778.5	13,775.1	10,822.5	89.8	91.1	95.03	-772.6	2,993.5	501.7	324.0	177.68	2.823	
13,700.0	10,779.0	13,875.1	10,822.9	92.6	93.9	95.01	-772.6	3,093.5	501.7	318.4	183.31	2.737	
13,800.0	10,779.6	13,975.1	10,823.2	95.4	96.6	94.99	-772.6	3,193.5	501.7	312.7	188.94	2.655	
13,900.0	10,780.1	14,075.1	10,823.6	98.3	99.4	94.97	-772.6	3,293.5	501.6	307.0	194.59	2.578	
14,000.0	10,780.6	14,175.1	10,823.9	101.1	102.2	94.95	-772.6	3,393.5	501.6	301.4	200.26	2.505	
14,100.0	10,781.1	14,275.1	10,824.3	103.9	105.0	94.93	-772.6	3,493.5	501.6	295.7	205.93	2.436	
14,200.0	10,781.7	14,375.1	10,824.6	106.8	107.8	94.91	-772.6	3,593.5	501.6	290.0	211.61	2.370	
14,300.0	10,782.2	14,475.1	10,825.0	109.6	110.6	94.89	-772.6	3,693.5	501.6	284.3	217.30	2.308	
14,400.0	10,782.7	14,575.1	10,825.3	112.5	113.4	94.87	-772.6	3,793.5	501.6	278.6	223.00	2.249	
14,500.0	10,783.2	14,675.1	10,825.7	115.3	116.2	94.85	-772.6	3,893.5	501.5	272.8	228.71	2.193	
14,600.0	10,783.8	14,775.1	10,826.0	118.2	119.0	94.83	-772.6	3,993.5	501.5	267.1	234.43	2.139	
14,700.0	10,784.3	14,875.1	10,826.4	121.1	121.8	94.81	-772.6	4,093.5	501.5	261.4	240.15	2.088	
14,800.0	10,784.8	14,975.1	10,826.7	123.9	124.6	94.79	-772.6	4,193.5	501.5	255.6	245.88	2.040	
14,900.0	10,785.3	15,075.1	10,827.1	126.8	127.5	94.77	-772.6	4,293.5	501.5	249.9	251.61	1.993	
15,000.0	10,785.8	15,175.1	10,827.4	129.7	130.3	94.75	-772.6	4,393.5	501.5	244.1	257.35	1.949	
15,100.0	10,786.4	15,275.1	10,827.8	132.5	133.2	94.73	-772.6	4,493.5	501.5	238.4	263.10	1.906	
15,200.0	10,786.9	15,375.1	10,828.1	135.4	136.0	94.71	-772.6	4,593.5	501.4	232.6	268.84	1.865	
15,300.0	10,787.4	15,475.1	10,828.5	138.3	138.9	94.70	-772.6	4,693.5	501.4	226.8	274.60	1.826	
15,400.0	10,787.9	15,575.1	10,828.8	141.2	141.7	94.68	-772.6	4,793.5	501.4	221.1	280.36	1.788	
15,500.0	10,788.5	15,675.1	10,829.2	144.0	144.6	94.66	-772.6	4,893.5	501.4	215.3	286.12	1.752	
15,600.0	10,789.0	15,775.1	10,829.5	146.9	147.4	94.64	-772.6	4,993.5	501.4	209.5	291.89	1.718	
15,700.0	10,789.5	15,875.1	10,829.9	149.8	150.3	94.62	-772.6	5,093.5	501.4	203.7	297.66	1.684	
15,800.0	10,790.0	15,975.1	10,830.2	152.7	153.1	94.60	-772.6	5,193.5	501.4	197.9	303.43	1.652	
15,900.0	10,790.6	16,075.1	10,830.6	155.6	156.0	94.58	-772.6	5,293.5	501.3	192.1	309.21	1.621	
16,000.0	10,791.1	16,175.1	10,830.9	158.5	158.9	94.56	-772.6	5,393.5	501.3	186.3	314.99	1.592	
16,100.0	10,791.6	16,275.1	10,831.3	161.4	161.8	94.54	-772.6	5,493.5	501.3	180.5	320.77	1.563	
16,200.0	10,792.1	16,375.1	10,831.6	164.3	164.6	94.52	-772.6	5,593.5	501.3	174.7	326.56	1.535	
16,300.0	10,792.7	16,475.1	10,832.0	167.2	167.5	94.50	-772.6	5,693.5	501.3	168.9	332.35	1.508	
16,400.0	10,793.2	16,575.1	10,832.3	170.1	170.4	94.48	-772.6	5,793.5	501.3	163.1	338.14	1.482	Level 3Level 3
16,500.0	10,793.7	16,675.1	10,832.7	173.0	173.3	94.46	-772.6	5,893.5	501.3	157.3	343.93	1.457	Level 3Level 3
16,600.0	10,794.2	16,775.1	10,833.0	175.9	176.1	94.44	-772.6	5,993.5	501.2	151.5	349.73	1.433	Level 3Level 3
16,700.0	10,794.8	16,875.1	10,833.4	178.8	179.0	94.42	-772.6	6,093.5	501.2	145.7	355.52	1.410	Level 3Level 3
16,800.0	10,795.3	16,975.1	10,833.7	181.7	181.9	94.40	-772.6	6,193.5	501.2	139.9	361.32	1.387	Level 3Level 3
16,900.0	10,795.8	17,075.1	10,834.0	184.6	184.8	94.38	-772.6	6,293.5	501.2	134.1	367.13	1.365	Level 3Level 3
17,000.0	10,796.3	17,175.1	10,834.4	187.5	187.7	94.36	-772.6	6,393.5	501.2	128.3	372.93	1.344	Level 3Level 3
17,100.0	10,796.8	17,275.1	10,834.7	190.4	190.6	94.34	-772.6	6,493.5	501.2	122.4	378.74	1.323	Level 3Level 3
17,200.0	10,797.4	17,375.1	10,835.1	193.3	193.5	94.32	-772.6	6,593.5	501.2	116.6	384.54	1.303	Level 3Level 3
17,300.0	10,797.9	17,475.1	10,835.4	196.2	196.4	94.30	-772.6	6,693.5	501.2	110.8	390.35	1.284	Level 3Level 3
17,400.0	10,798.4	17,575.1	10,835.8	199.1	199.2	94.28	-772.6	6,793.5	501.1	105.0	396.16	1.265	Level 3Level 3
17,500.0	10,798.9	17,675.1	10,836.1	202.0	202.1	94.26	-772.6	6,893.5	501.1	99.2	401.98	1.247	Level 2
17,600.0	10,799.5	17,775.1	10,836.5	204.9	205.0	94.24	-772.6	6,993.5	501.1	93.3	407.79	1.229	Level 2
17,700.0	10,800.0	17,875.1	10,836.8	207.8	207.9	94.22	-772.6	7,093.5	501.1	87.5	413.61	1.212	Level 2
17,800.0	10,800.5	17,975.1	10,837.2	210.7	210.8	94.20	-772.6	7,193.5	501.1	81.7	419.42	1.195	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 8T
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 8T	Survey Calculation Method:	Minimum Curvature
Well Error:	2.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Kline Federal 5300 31-18 8T	Database:	EDM_new
Reference Design:	Design #1	Offset TVD Reference:	Offset Datum

Offset Design 153N-100W-17/18 - Kline Federal 5300 31-18 7T2 - Kline Federal 5300 31-18 7T2 - 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
17,900.0	10,801.0	18,075.1	10,837.5	213.6	213.7	94.18	-772.6	7,293.5	501.1	75.8	425.24	1.178	Level 2
18,000.0	10,801.6	18,175.1	10,837.9	216.5	216.6	94.16	-772.6	7,393.5	501.1	70.0	431.06	1.162	Level 2
18,100.0	10,802.1	18,275.1	10,838.2	219.5	219.5	94.14	-772.6	7,493.5	501.1	64.2	436.88	1.147	Level 2
18,200.0	10,802.6	18,375.1	10,838.6	222.4	222.4	94.12	-772.6	7,593.5	501.0	58.3	442.71	1.132	Level 2
18,300.0	10,803.1	18,475.1	10,838.9	225.3	225.3	94.10	-772.6	7,693.5	501.0	52.5	448.53	1.117	Level 2
18,400.0	10,803.7	18,575.1	10,839.3	228.2	228.2	94.08	-772.6	7,793.5	501.0	46.7	454.35	1.103	Level 2
18,500.0	10,804.2	18,675.1	10,839.6	231.1	231.1	94.06	-772.6	7,893.5	501.0	40.8	460.18	1.089	Level 2
18,600.0	10,804.7	18,775.1	10,840.0	234.0	234.0	94.04	-772.6	7,993.5	501.0	35.0	466.01	1.075	Level 2
18,700.0	10,805.2	18,875.1	10,840.3	236.9	236.9	94.02	-772.6	8,093.5	501.0	29.1	471.83	1.062	Level 2
18,800.0	10,805.7	18,975.1	10,840.7	239.8	239.8	94.00	-772.6	8,193.5	501.0	23.3	477.66	1.049	Level 2
18,900.0	10,806.3	19,075.1	10,841.0	242.8	242.7	93.98	-772.6	8,293.5	501.0	17.5	483.49	1.036	Level 2
19,000.0	10,806.8	19,175.1	10,841.4	245.7	245.6	93.96	-772.6	8,393.5	500.9	11.6	489.32	1.024	Level 2
19,100.0	10,807.3	19,275.1	10,841.7	248.6	248.5	93.94	-772.6	8,493.5	500.9	5.8	495.15	1.012	Level 2
19,200.0	10,807.8	19,375.1	10,842.1	251.5	251.5	93.92	-772.6	8,593.5	500.9	-0.1	500.99	1.000	Level 1
19,300.0	10,808.4	19,475.1	10,842.4	254.4	254.4	93.90	-772.6	8,693.5	500.9	-5.9	506.82	0.988	Level 1
19,400.0	10,808.9	19,575.1	10,842.8	257.3	257.3	93.88	-772.6	8,793.5	500.9	-11.8	512.65	0.977	Level 1
19,500.0	10,809.4	19,675.1	10,843.1	260.2	260.2	93.86	-772.6	8,893.5	500.9	-17.6	518.49	0.966	Level 1
19,600.0	10,809.9	19,775.1	10,843.5	263.2	263.1	93.84	-772.6	8,993.5	500.9	-23.5	524.33	0.955	Level 1
19,700.0	10,810.5	19,875.1	10,843.8	266.1	266.0	93.82	-772.6	9,093.5	500.9	-29.3	530.16	0.945	Level 1
19,800.0	10,811.0	19,975.1	10,844.2	269.0	268.9	93.80	-772.6	9,193.5	500.8	-35.2	536.00	0.934	Level 1
19,900.0	10,811.5	20,075.1	10,844.5	271.9	271.8	93.78	-772.6	9,293.5	500.8	-41.0	541.84	0.924	Level 1
20,000.0	10,812.0	20,175.1	10,844.9	274.8	274.7	93.76	-772.6	9,393.5	500.8	-46.9	547.68	0.914	Level 1
20,100.0	10,812.6	20,275.1	10,845.2	277.8	277.6	93.74	-772.6	9,493.5	500.8	-52.7	553.52	0.905	Level 1
20,200.0	10,813.1	20,375.1	10,845.6	280.7	280.6	93.72	-772.6	9,593.5	500.8	-58.6	559.36	0.895	Level 1
20,300.0	10,813.6	20,475.1	10,845.9	283.6	283.5	93.70	-772.6	9,693.5	500.8	-64.4	565.20	0.886	Level 1
20,400.0	10,814.1	20,575.1	10,846.3	286.5	286.4	93.68	-772.6	9,793.5	500.8	-70.3	571.04	0.877	Level 1
20,500.0	10,814.6	20,675.1	10,846.6	289.4	289.3	93.66	-772.6	9,893.5	500.8	-76.1	576.88	0.868	Level 1
20,600.0	10,815.2	20,775.1	10,847.0	292.4	292.2	93.64	-772.6	9,993.5	500.8	-82.0	582.72	0.859	Level 1
20,656.4	10,815.5	20,831.5	10,847.2	294.0	293.8	93.63	-772.6	10,049.9	500.8	-85.3	586.02	0.854	Level 1, ES, SF

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 8T
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 8T	Survey Calculation Method:	Minimum Curvature
Well Error:	2.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Kline Federal 5300 31-18 8T	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 8T
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

Federal 5300 31-18 6B, Design #1 V0 — Kline Federal 5300 31-18 7T2, Kline Federal 5300 31-18 7T2, Design #1 V0

Company:	Oasis	Local Co-ordinate Reference:	Well Kline Federal 5300 31-18 8T
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 8T	Survey Calculation Method:	Minimum Curvature
Well Error:	2.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Kline Federal 5300 31-18 8T	Database:	EDM_new
Reference Design:	Design #1	Offset TVD Reference:	Offset Datum

Reference Depths are relative to WELL @ 2033.0usft (Original Well Ele Coordinates are relative to: Kline Federal 5300 31-18 8T
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

Federal 5300 31-18 6B, Design #1 V0 — Kline Federal 5300 31-18 7T2, Kline Federal 5300 31-18 7T2, Design #1 V0

Oasis

Indian Hills
153N-100W-17/18
Kline Federal 5300 31-18 8T

Kline Federal 5300 31-18 8T

Plan: Design #1

Standard Planning Report

18 July, 2014

Database:	EDM_new	Local Co-ordinate Reference:	Well Kline Federal 5300 31-18 8T
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 8T	Survey Calculation Method:	Minimum Curvature
Wellbore:	Kline Federal 5300 31-18 8T		
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 8T

Well Position	**+N/-S**	-1,744.9 usft	**Northing:**	407,221.73 usft	**Latitude:**	48° 4' 28.160 N
	+E/-W	-67.9 usft	**Easting:**	1,210,091.03 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 8T

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	
2,200.0	0.00	0.00	2,200.0	0.0	0.0	0.00	0.00	0.00	0.00	
2,216.7	0.50	0.00	2,216.7	0.1	0.0	3.00	3.00	0.00	0.00	
7,926.7	0.50	0.00	7,926.4	49.9	0.0	0.00	0.00	0.00	0.00	
7,943.3	0.00	0.00	7,943.1	50.0	0.0	3.00	-3.00	0.00	180.00	
10,287.8	0.00	0.00	10,287.6	50.0	0.0	0.00	0.00	0.00	0.00	
11,035.3	89.70	109.50	10,765.0	-108.6	447.7	12.00	12.00	0.00	109.50	
12,010.3	89.70	90.00	10,770.2	-272.9	1,404.0	2.00	0.00	-2.00	-90.05	
20,656.4	89.70	90.00	10,815.5	-272.9	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 8T
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 8T	Survey Calculation Method:	Minimum Curvature
Wellbore:	Kline Federal 5300 31-18 8T		
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
2,216.7	0.50	0.00	2,216.7	0.1	0.0	0.0	3.00	3.00	0.00
2,300.0	0.50	0.00	2,300.0	0.8	0.0	0.0	0.00	0.00	0.00
2,400.0	0.50	0.00	2,400.0	1.7	0.0	0.0	0.00	0.00	0.00
2,500.0	0.50	0.00	2,500.0	2.5	0.0	0.0	0.00	0.00	0.00
2,600.0	0.50	0.00	2,600.0	3.4	0.0	0.0	0.00	0.00	0.00
2,700.0	0.50	0.00	2,700.0	4.3	0.0	0.0	0.00	0.00	0.00
2,800.0	0.50	0.00	2,800.0	5.2	0.0	0.0	0.00	0.00	0.00
2,900.0	0.50	0.00	2,900.0	6.0	0.0	0.0	0.00	0.00	0.00
3,000.0	0.50	0.00	3,000.0	6.9	0.0	0.0	0.00	0.00	0.00
3,100.0	0.50	0.00	3,100.0	7.8	0.0	0.0	0.00	0.00	0.00
3,200.0	0.50	0.00	3,200.0	8.7	0.0	0.0	0.00	0.00	0.00
3,300.0	0.50	0.00	3,300.0	9.5	0.0	0.0	0.00	0.00	0.00
3,400.0	0.50	0.00	3,400.0	10.4	0.0	0.0	0.00	0.00	0.00
3,500.0	0.50	0.00	3,500.0	11.3	0.0	0.0	0.00	0.00	0.00
3,600.0	0.50	0.00	3,599.9	12.1	0.0	0.0	0.00	0.00	0.00
3,700.0	0.50	0.00	3,699.9	13.0	0.0	0.0	0.00	0.00	0.00
3,800.0	0.50	0.00	3,799.9	13.9	0.0	0.0	0.00	0.00	0.00
3,900.0	0.50	0.00	3,899.9	14.8	0.0	0.0	0.00	0.00	0.00
4,000.0	0.50	0.00	3,999.9	15.6	0.0	0.0	0.00	0.00	0.00
4,100.0	0.50	0.00	4,099.9	16.5	0.0	0.0	0.00	0.00	0.00
4,200.0	0.50	0.00	4,199.9	17.4	0.0	0.0	0.00	0.00	0.00
4,300.0	0.50	0.00	4,299.9	18.3	0.0	0.0	0.00	0.00	0.00
4,400.0	0.50	0.00	4,399.9	19.1	0.0	0.0	0.00	0.00	0.00
4,500.0	0.50	0.00	4,499.9	20.0	0.0	0.0	0.00	0.00	0.00
4,570.1	0.50	0.00	4,570.0	20.6	0.0	0.0	0.00	0.00	0.00
Greenhorn									

Database:	EDM_new	Local Co-ordinate Reference:	Well Kline Federal 5300 31-18 8T
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 8T	Survey Calculation Method:	Minimum Curvature
Wellbore:	Kline Federal 5300 31-18 8T		
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)
4,600.0	0.50	0.00	4,599.9	20.9	0.0	0.0	0.00	0.00	0.00
4,700.0	0.50	0.00	4,699.9	21.7	0.0	0.0	0.00	0.00	0.00
4,800.0	0.50	0.00	4,799.9	22.6	0.0	0.0	0.00	0.00	0.00
4,900.0	0.50	0.00	4,899.9	23.5	0.0	0.0	0.00	0.00	0.00
4,976.1	0.50	0.00	4,976.0	24.2	0.0	0.0	0.00	0.00	0.00
Mowry									
5,000.0	0.50	0.00	4,999.9	24.4	0.0	0.0	0.00	0.00	0.00
5,100.0	0.50	0.00	5,099.9	25.2	0.0	0.0	0.00	0.00	0.00
5,200.0	0.50	0.00	5,199.9	26.1	0.0	0.0	0.00	0.00	0.00
5,300.0	0.50	0.00	5,299.9	27.0	0.0	0.0	0.00	0.00	0.00
5,400.0	0.50	0.00	5,399.9	27.9	0.0	0.0	0.00	0.00	0.00
5,403.1	0.50	0.00	5,403.0	27.9	0.0	0.0	0.00	0.00	0.00
Dakota									
5,500.0	0.50	0.00	5,499.9	28.7	0.0	0.0	0.00	0.00	0.00
5,600.0	0.50	0.00	5,599.9	29.6	0.0	0.0	0.00	0.00	0.00
5,700.0	0.50	0.00	5,699.9	30.5	0.0	0.0	0.00	0.00	0.00
5,800.0	0.50	0.00	5,799.9	31.3	0.0	0.0	0.00	0.00	0.00
5,900.0	0.50	0.00	5,899.9	32.2	0.0	0.0	0.00	0.00	0.00
6,000.0	0.50	0.00	5,999.9	33.1	0.0	0.0	0.00	0.00	0.00
6,100.0	0.50	0.00	6,099.9	34.0	0.0	0.0	0.00	0.00	0.00
6,101.1	0.50	0.00	6,101.0	34.0	0.0	0.0	0.00	0.00	0.00
9-5/8" Dakota String									
6,200.0	0.50	0.00	6,199.8	34.8	0.0	0.0	0.00	0.00	0.00
6,300.0	0.50	0.00	6,299.8	35.7	0.0	0.0	0.00	0.00	0.00
6,400.0	0.50	0.00	6,399.8	36.6	0.0	0.0	0.00	0.00	0.00
6,402.2	0.50	0.00	6,402.0	36.6	0.0	0.0	0.00	0.00	0.00
Rierdon									
6,500.0	0.50	0.00	6,499.8	37.5	0.0	0.0	0.00	0.00	0.00
6,600.0	0.50	0.00	6,599.8	38.3	0.0	0.0	0.00	0.00	0.00
6,700.0	0.50	0.00	6,699.8	39.2	0.0	0.0	0.00	0.00	0.00
6,740.2	0.50	0.00	6,740.0	39.5	0.0	0.0	0.00	0.00	0.00
Dunham Salt									
6,800.0	0.50	0.00	6,799.8	40.1	0.0	0.0	0.00	0.00	0.00
6,851.2	0.50	0.00	6,851.0	40.5	0.0	0.0	0.00	0.00	0.00
Dunham Salt Base									
6,900.0	0.50	0.00	6,899.8	40.9	0.0	0.0	0.00	0.00	0.00
6,948.2	0.50	0.00	6,948.0	41.4	0.0	0.0	0.00	0.00	0.00
Spearfish									
7,000.0	0.50	0.00	6,999.8	41.8	0.0	0.0	0.00	0.00	0.00
7,100.0	0.50	0.00	7,099.8	42.7	0.0	0.0	0.00	0.00	0.00
7,200.0	0.50	0.00	7,199.8	43.6	0.0	0.0	0.00	0.00	0.00
7,203.2	0.50	0.00	7,203.0	43.6	0.0	0.0	0.00	0.00	0.00
Pine Salt									
7,251.2	0.50	0.00	7,251.0	44.0	0.0	0.0	0.00	0.00	0.00
Pine Salt Base									
7,296.2	0.50	0.00	7,296.0	44.4	0.0	0.0	0.00	0.00	0.00
Opeche Salt									
7,300.0	0.50	0.00	7,299.8	44.4	0.0	0.0	0.00	0.00	0.00
7,326.2	0.50	0.00	7,326.0	44.7	0.0	0.0	0.00	0.00	0.00
Opeche Salt Base									
7,400.0	0.50	0.00	7,399.8	45.3	0.0	0.0	0.00	0.00	0.00
7,500.0	0.50	0.00	7,499.8	46.2	0.0	0.0	0.00	0.00	0.00
7,528.2	0.50	0.00	7,528.0	46.4	0.0	0.0	0.00	0.00	0.00

Database:	EDM_new	Local Co-ordinate Reference:	Well Kline Federal 5300 31-18 8T
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 8T	Survey Calculation Method:	Minimum Curvature
Wellbore:	Kline Federal 5300 31-18 8T		
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	0.50	0.00	7,599.8	47.1	0.0	0.0	0.00	0.00	0.00
7,608.2	0.50	0.00	7,608.0	47.1	0.0	0.0	0.00	0.00	0.00
Amsden									
7,700.0	0.50	0.00	7,699.8	47.9	0.0	0.0	0.00	0.00	0.00
7,776.2	0.50	0.00	7,776.0	48.6	0.0	0.0	0.00	0.00	0.00
Tyler									
7,800.0	0.50	0.00	7,799.8	48.8	0.0	0.0	0.00	0.00	0.00
7,900.0	0.50	0.00	7,899.8	49.7	0.0	0.0	0.00	0.00	0.00
7,926.7	0.50	0.00	7,926.4	49.9	0.0	0.0	0.00	0.00	0.00
7,943.3	0.00	0.00	7,943.1	50.0	0.0	0.0	3.00	-3.00	0.00
7,967.2	0.00	0.00	7,967.0	50.0	0.0	0.0	0.00	0.00	0.00
Otter (Base of Minnelusa Gp.)									
8,000.0	0.00	0.00	7,999.8	50.0	0.0	0.0	0.00	0.00	0.00
8,100.0	0.00	0.00	8,099.8	50.0	0.0	0.0	0.00	0.00	0.00
8,200.0	0.00	0.00	8,199.8	50.0	0.0	0.0	0.00	0.00	0.00
8,300.0	0.00	0.00	8,299.8	50.0	0.0	0.0	0.00	0.00	0.00
8,322.2	0.00	0.00	8,322.0	50.0	0.0	0.0	0.00	0.00	0.00
Kibbey Lime									
8,400.0	0.00	0.00	8,399.8	50.0	0.0	0.0	0.00	0.00	0.00
8,472.2	0.00	0.00	8,472.0	50.0	0.0	0.0	0.00	0.00	0.00
Charles Salt									
8,500.0	0.00	0.00	8,499.8	50.0	0.0	0.0	0.00	0.00	0.00
8,600.0	0.00	0.00	8,599.8	50.0	0.0	0.0	0.00	0.00	0.00
8,700.0	0.00	0.00	8,699.8	50.0	0.0	0.0	0.00	0.00	0.00
8,800.0	0.00	0.00	8,799.8	50.0	0.0	0.0	0.00	0.00	0.00
8,900.0	0.00	0.00	8,899.8	50.0	0.0	0.0	0.00	0.00	0.00
9,000.0	0.00	0.00	8,999.8	50.0	0.0	0.0	0.00	0.00	0.00
9,096.2	0.00	0.00	9,096.0	50.0	0.0	0.0	0.00	0.00	0.00
UB									
9,100.0	0.00	0.00	9,099.8	50.0	0.0	0.0	0.00	0.00	0.00
9,171.2	0.00	0.00	9,171.0	50.0	0.0	0.0	0.00	0.00	0.00
Base Last Salt									
9,200.0	0.00	0.00	9,199.8	50.0	0.0	0.0	0.00	0.00	0.00
9,219.2	0.00	0.00	9,219.0	50.0	0.0	0.0	0.00	0.00	0.00
Ratcliffe									
9,300.0	0.00	0.00	9,299.8	50.0	0.0	0.0	0.00	0.00	0.00
9,395.2	0.00	0.00	9,395.0	50.0	0.0	0.0	0.00	0.00	0.00
Mission Canyon									
9,400.0	0.00	0.00	9,399.8	50.0	0.0	0.0	0.00	0.00	0.00
9,500.0	0.00	0.00	9,499.8	50.0	0.0	0.0	0.00	0.00	0.00
9,600.0	0.00	0.00	9,599.8	50.0	0.0	0.0	0.00	0.00	0.00
9,700.0	0.00	0.00	9,699.8	50.0	0.0	0.0	0.00	0.00	0.00
9,800.0	0.00	0.00	9,799.8	50.0	0.0	0.0	0.00	0.00	0.00
9,900.0	0.00	0.00	9,899.8	50.0	0.0	0.0	0.00	0.00	0.00
9,957.2	0.00	0.00	9,957.0	50.0	0.0	0.0	0.00	0.00	0.00
Lodgepole									
10,000.0	0.00	0.00	9,999.8	50.0	0.0	0.0	0.00	0.00	0.00
10,100.0	0.00	0.00	10,099.8	50.0	0.0	0.0	0.00	0.00	0.00
10,163.2	0.00	0.00	10,163.0	50.0	0.0	0.0	0.00	0.00	0.00
Lodgepole Fracture Zone									
10,200.0	0.00	0.00	10,199.8	50.0	0.0	0.0	0.00	0.00	0.00

Database:	EDM_new	Local Co-ordinate Reference:	Well Kline Federal 5300 31-18 8T
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 8T	Survey Calculation Method:	Minimum Curvature
Wellbore:	Kline Federal 5300 31-18 8T		
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)
10,287.8	0.00	0.00	10,287.6	50.0	0.0	0.0	0.00	0.00	0.00
KOP Build 12°/100'									
10,300.0	1.46	109.50	10,299.8	49.9	0.1	0.1	12.00	12.00	0.00
10,400.0	13.46	109.50	10,398.8	45.6	12.4	12.4	12.00	12.00	0.00
10,500.0	25.46	109.50	10,492.9	34.5	43.7	43.7	12.00	12.00	0.00
10,600.0	37.46	109.50	10,578.0	17.1	92.8	92.8	12.00	12.00	0.00
10,700.0	49.46	109.50	10,650.5	-5.8	157.6	157.6	12.00	12.00	0.00
10,703.9	49.94	109.50	10,653.0	-6.8	160.4	160.4	12.00	12.00	0.00
False Bakken									
10,719.8	51.84	109.50	10,663.0	-10.9	172.0	172.0	12.00	12.00	0.00
Upper Bakken									
10,743.2	54.65	109.50	10,677.0	-17.2	189.7	189.7	12.00	12.00	0.00
Middle Bakken									
10,800.0	61.46	109.50	10,707.0	-33.3	235.1	235.1	12.00	12.00	0.00
10,833.5	65.48	109.50	10,722.0	-43.3	263.3	263.3	12.00	12.00	0.00
Lower Bakken									
10,870.4	69.91	109.50	10,736.0	-54.7	295.5	295.5	12.00	12.00	0.00
Pronghorn									
10,900.0	73.46	109.50	10,745.3	-64.0	322.0	322.0	12.00	12.00	0.00
10,909.8	74.64	109.50	10,748.0	-67.2	330.9	330.9	12.00	12.00	0.00
Three Forks									
10,968.3	81.66	109.50	10,760.0	-86.3	384.8	384.8	12.00	12.00	0.00
TF Target Top									
11,000.0	85.46	109.50	10,763.6	-96.8	414.5	414.5	12.00	12.00	0.00
11,035.3	89.70	109.50	10,765.0	-108.6	447.7	447.7	12.00	12.00	0.00
EOC									
11,036.0	89.70	109.49	10,765.0	-108.8	448.4	448.4	2.00	0.00	-2.00
7" Intermediate									
11,100.0	89.70	108.21	10,765.4	-129.5	508.9	508.9	2.00	0.00	-2.00
11,200.0	89.70	106.21	10,765.9	-159.1	604.5	604.5	2.00	0.00	-2.00
11,300.0	89.70	104.21	10,766.4	-185.3	701.0	701.0	2.00	0.00	-2.00
11,400.0	89.70	102.21	10,767.0	-208.1	798.3	798.3	2.00	0.00	-2.00
11,500.0	89.70	100.21	10,767.5	-227.6	896.4	896.4	2.00	0.00	-2.00
11,600.0	89.70	98.21	10,768.0	-243.6	995.1	995.1	2.00	0.00	-2.00
11,700.0	89.70	96.21	10,768.6	-256.1	1,094.3	1,094.3	2.00	0.00	-2.00
11,800.0	89.70	94.21	10,769.1	-265.2	1,193.9	1,193.9	2.00	0.00	-2.00
11,900.0	89.70	92.21	10,769.6	-270.8	1,293.7	1,293.7	2.00	0.00	-2.00
11,973.0	89.70	90.75	10,770.0	-272.6	1,366.7	1,366.7	2.00	0.00	-2.00
TF Target Base									
12,000.0	89.70	90.21	10,770.1	-272.9	1,393.7	1,393.7	2.00	0.00	-2.00
12,010.3	89.70	90.00	10,770.2	-272.9	1,404.0	1,404.0	2.00	0.00	-2.00
12,100.0	89.70	90.00	10,770.7	-272.9	1,493.7	1,493.7	0.00	0.00	0.00
12,164.0	89.70	90.00	10,771.0	-272.9	1,557.7	1,557.7	0.00	0.00	0.00
Claystone									
12,200.0	89.70	90.00	10,771.2	-272.9	1,593.7	1,593.7	0.00	0.00	0.00
12,300.0	89.70	90.00	10,771.7	-272.9	1,693.7	1,693.7	0.00	0.00	0.00
12,400.0	89.70	90.00	10,772.2	-272.9	1,793.7	1,793.7	0.00	0.00	0.00
12,500.0	89.70	90.00	10,772.8	-272.9	1,893.7	1,893.7	0.00	0.00	0.00
12,600.0	89.70	90.00	10,773.3	-272.9	1,993.7	1,993.7	0.00	0.00	0.00
12,700.0	89.70	90.00	10,773.8	-272.9	2,093.7	2,093.7	0.00	0.00	0.00
12,800.0	89.70	90.00	10,774.3	-272.9	2,193.7	2,193.7	0.00	0.00	0.00
12,900.0	89.70	90.00	10,774.9	-272.9	2,293.7	2,293.7	0.00	0.00	0.00

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Site:	153N-100W-17/18	North Reference:	True
Well:	Kline Federal 5300 31-18 8T	Survey Calculation Method:	Minimum Curvature
Wellbore:	Kline Federal 5300 31-18 8T		
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)
13,000.0	89.70	90.00	10,775.4	-272.9	2,393.7	2,393.7	0.00	0.00	0.00
13,100.0	89.70	90.00	10,775.9	-272.9	2,493.7	2,493.7	0.00	0.00	0.00
13,200.0	89.70	90.00	10,776.4	-272.9	2,593.7	2,593.7	0.00	0.00	0.00
13,300.0	89.70	90.00	10,776.9	-272.9	2,693.7	2,693.7	0.00	0.00	0.00
13,400.0	89.70	90.00	10,777.5	-272.9	2,793.7	2,793.7	0.00	0.00	0.00
13,500.0	89.70	90.00	10,778.0	-272.9	2,893.7	2,893.7	0.00	0.00	0.00
13,600.0	89.70	90.00	10,778.5	-272.9	2,993.7	2,993.7	0.00	0.00	0.00
13,700.0	89.70	90.00	10,779.0	-272.9	3,093.7	3,093.7	0.00	0.00	0.00
13,800.0	89.70	90.00	10,779.6	-272.9	3,193.7	3,193.7	0.00	0.00	0.00
13,900.0	89.70	90.00	10,780.1	-272.9	3,293.7	3,293.7	0.00	0.00	0.00
14,000.0	89.70	90.00	10,780.6	-272.9	3,393.7	3,393.7	0.00	0.00	0.00
14,100.0	89.70	90.00	10,781.1	-272.9	3,493.7	3,493.7	0.00	0.00	0.00
14,200.0	89.70	90.00	10,781.7	-272.9	3,593.7	3,593.7	0.00	0.00	0.00
14,300.0	89.70	90.00	10,782.2	-272.9	3,693.7	3,693.7	0.00	0.00	0.00
14,400.0	89.70	90.00	10,782.7	-272.9	3,793.7	3,793.7	0.00	0.00	0.00
14,500.0	89.70	90.00	10,783.2	-272.9	3,893.7	3,893.7	0.00	0.00	0.00
14,600.0	89.70	90.00	10,783.8	-272.9	3,993.7	3,993.7	0.00	0.00	0.00
14,700.0	89.70	90.00	10,784.3	-272.9	4,093.7	4,093.7	0.00	0.00	0.00
14,800.0	89.70	90.00	10,784.8	-272.9	4,193.7	4,193.7	0.00	0.00	0.00
14,900.0	89.70	90.00	10,785.3	-272.9	4,293.7	4,293.7	0.00	0.00	0.00
15,000.0	89.70	90.00	10,785.8	-272.9	4,393.7	4,393.7	0.00	0.00	0.00
15,100.0	89.70	90.00	10,786.4	-272.9	4,493.7	4,493.7	0.00	0.00	0.00
15,200.0	89.70	90.00	10,786.9	-272.9	4,593.7	4,593.7	0.00	0.00	0.00
15,300.0	89.70	90.00	10,787.4	-272.9	4,693.6	4,693.6	0.00	0.00	0.00
15,400.0	89.70	90.00	10,787.9	-272.9	4,793.6	4,793.6	0.00	0.00	0.00
15,500.0	89.70	90.00	10,788.5	-272.9	4,893.6	4,893.6	0.00	0.00	0.00
15,600.0	89.70	90.00	10,789.0	-272.9	4,993.6	4,993.6	0.00	0.00	0.00
15,700.0	89.70	90.00	10,789.5	-272.9	5,093.6	5,093.6	0.00	0.00	0.00
15,800.0	89.70	90.00	10,790.0	-272.9	5,193.6	5,193.6	0.00	0.00	0.00
15,900.0	89.70	90.00	10,790.6	-272.9	5,293.6	5,293.6	0.00	0.00	0.00
16,000.0	89.70	90.00	10,791.1	-272.9	5,393.6	5,393.6	0.00	0.00	0.00
16,100.0	89.70	90.00	10,791.6	-272.9	5,493.6	5,493.6	0.00	0.00	0.00
16,200.0	89.70	90.00	10,792.1	-272.9	5,593.6	5,593.6	0.00	0.00	0.00
16,300.0	89.70	90.00	10,792.7	-272.9	5,693.6	5,693.6	0.00	0.00	0.00
16,400.0	89.70	90.00	10,793.2	-272.9	5,793.6	5,793.6	0.00	0.00	0.00
16,500.0	89.70	90.00	10,793.7	-272.9	5,893.6	5,893.6	0.00	0.00	0.00
16,600.0	89.70	90.00	10,794.2	-272.9	5,993.6	5,993.6	0.00	0.00	0.00
16,700.0	89.70	90.00	10,794.8	-272.9	6,093.6	6,093.6	0.00	0.00	0.00
16,800.0	89.70	90.00	10,795.3	-272.9	6,193.6	6,193.6	0.00	0.00	0.00
16,900.0	89.70	90.00	10,795.8	-272.9	6,293.6	6,293.6	0.00	0.00	0.00
17,000.0	89.70	90.00	10,796.3	-272.9	6,393.6	6,393.6	0.00	0.00	0.00
17,100.0	89.70	90.00	10,796.8	-272.9	6,493.6	6,493.6	0.00	0.00	0.00
17,200.0	89.70	90.00	10,797.4	-272.9	6,593.6	6,593.6	0.00	0.00	0.00
17,300.0	89.70	90.00	10,797.9	-272.9	6,693.6	6,693.6	0.00	0.00	0.00
17,400.0	89.70	90.00	10,798.4	-272.9	6,793.6	6,793.6	0.00	0.00	0.00
17,500.0	89.70	90.00	10,798.9	-272.9	6,893.6	6,893.6	0.00	0.00	0.00
17,600.0	89.70	90.00	10,799.5	-272.9	6,993.6	6,993.6	0.00	0.00	0.00
17,700.0	89.70	90.00	10,800.0	-272.9	7,093.6	7,093.6	0.00	0.00	0.00
17,800.0	89.70	90.00	10,800.5	-272.9	7,193.6	7,193.6	0.00	0.00	0.00
17,900.0	89.70	90.00	10,801.0	-272.9	7,293.6	7,293.6	0.00	0.00	0.00
18,000.0	89.70	90.00	10,801.6	-272.9	7,393.6	7,393.6	0.00	0.00	0.00
18,100.0	89.70	90.00	10,802.1	-272.9	7,493.6	7,493.6	0.00	0.00	0.00
18,200.0	89.70	90.00	10,802.6	-272.9	7,593.6	7,593.6	0.00	0.00	0.00
18,300.0	89.70	90.00	10,803.1	-272.9	7,693.6	7,693.6	0.00	0.00	0.00

Database:	EDM_new	Local Co-ordinate Reference:	Well Kline Federal 5300 31-18 8T
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 8T	Survey Calculation Method:	Minimum Curvature
Wellbore:	Kline Federal 5300 31-18 8T		
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	89.70	90.00	10,803.7	-272.9	7,793.6	7,793.6	0.00	0.00	0.00
18,500.0	89.70	90.00	10,804.2	-272.9	7,893.6	7,893.6	0.00	0.00	0.00
18,600.0	89.70	90.00	10,804.7	-272.9	7,993.6	7,993.6	0.00	0.00	0.00
18,700.0	89.70	90.00	10,805.2	-272.9	8,093.6	8,093.6	0.00	0.00	0.00
18,800.0	89.70	90.00	10,805.7	-272.9	8,193.6	8,193.6	0.00	0.00	0.00
18,900.0	89.70	90.00	10,806.3	-272.9	8,293.6	8,293.6	0.00	0.00	0.00
19,000.0	89.70	90.00	10,806.8	-272.9	8,393.6	8,393.6	0.00	0.00	0.00
19,100.0	89.70	90.00	10,807.3	-272.9	8,493.6	8,493.6	0.00	0.00	0.00
19,200.0	89.70	90.00	10,807.8	-272.9	8,593.6	8,593.6	0.00	0.00	0.00
19,300.0	89.70	90.00	10,808.4	-272.9	8,693.6	8,693.6	0.00	0.00	0.00
19,400.0	89.70	90.00	10,808.9	-272.9	8,793.6	8,793.6	0.00	0.00	0.00
19,500.0	89.70	90.00	10,809.4	-272.9	8,893.6	8,893.6	0.00	0.00	0.00
19,600.0	89.70	90.00	10,809.9	-272.9	8,993.6	8,993.6	0.00	0.00	0.00
19,700.0	89.70	90.00	10,810.5	-272.9	9,093.6	9,093.6	0.00	0.00	0.00
19,800.0	89.70	90.00	10,811.0	-272.9	9,193.6	9,193.6	0.00	0.00	0.00
19,900.0	89.70	90.00	10,811.5	-272.9	9,293.6	9,293.6	0.00	0.00	0.00
20,000.0	89.70	90.00	10,812.0	-272.9	9,393.6	9,393.6	0.00	0.00	0.00
20,100.0	89.70	90.00	10,812.6	-272.9	9,493.6	9,493.6	0.00	0.00	0.00
20,200.0	89.70	90.00	10,813.1	-272.9	9,593.6	9,593.6	0.00	0.00	0.00
20,300.0	89.70	90.00	10,813.6	-272.9	9,693.6	9,693.6	0.00	0.00	0.00
20,400.0	89.70	90.00	10,814.1	-272.9	9,793.6	9,793.6	0.00	0.00	0.00
20,500.0	89.70	90.00	10,814.6	-272.9	9,893.6	9,893.6	0.00	0.00	0.00
20,600.0	89.70	90.00	10,815.2	-272.9	9,993.6	9,993.6	0.00	0.00	0.00
20,656.4	89.70	90.00	10,815.5	-272.9	10,050.0	10,050.0	0.00	0.00	0.00
Kline Federal 5300 31-18 8T 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	0.00	0.00	10,815.5	-273.0	10,050.0	406,544.02	1,220,121.87	48° 4' 25.439 N	103° 33' 43.386 W
- plan misses target center by 0.1usft at 20656.4usft MD (10815.5 TVD, -272.9 N, 10050.0 E)									
- Point									

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
6,101.1	6,101.0	9-5/8" Dakota String	9-5/8	12-1/4
11,036.0	10,765.0	7" Intermediate	7	8-3/4

Database:	EDM_new	Local Co-ordinate Reference:	Well Kline Federal 5300 31-18 8T
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 8T	Survey Calculation Method:	Minimum Curvature
Wellbore:	Kline Federal 5300 31-18 8T		
Design:	Design #1		

Formations

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
1,923.0	1,923.0	Pierre			
4,570.1	4,570.0	Greenhorn			
4,976.1	4,976.0	Mowry			
5,403.1	5,403.0	Dakota			
6,402.2	6,402.0	Rierdon			
6,740.2	6,740.0	Dunham Salt			
6,851.2	6,851.0	Dunham Salt Base			
6,948.2	6,948.0	Spearfish			
7,203.2	7,203.0	Pine Salt			
7,251.2	7,251.0	Pine Salt Base			
7,296.2	7,296.0	Opeche Salt			
7,326.2	7,326.0	Opeche Salt Base			
7,528.2	7,528.0	Broom Creek (Top of Minnelusa Gp.			
7,608.2	7,608.0	Amsden			
7,776.2	7,776.0	Tyler			
7,967.2	7,967.0	Otter (Base of Minnelusa Gp.)			
8,322.2	8,322.0	Kibbey Lime			
8,472.2	8,472.0	Charles Salt			
9,096.2	9,096.0	UB			
9,171.2	9,171.0	Base Last Salt			
9,219.2	9,219.0	Ratcliffe			
9,395.2	9,395.0	Mission Canyon			
9,957.2	9,957.0	Lodgepole			
10,163.2	10,163.0	Lodgepole Fracture Zone			
10,703.9	10,653.0	False Bakken			
10,719.8	10,663.0	Upper Bakken			
10,743.2	10,677.0	Middle Bakken			
10,833.5	10,722.0	Lower Bakken			
10,870.4	10,736.0	Pronghorn			
10,909.8	10,748.0	Three Forks			
10,968.3	10,760.0	TF Target Top			
11,973.0	10,770.0	TF Target Base			
12,164.0	10,771.0	Claystone			

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	Local Coordinates +E/-W (usft)	Comment
10,287.8	10,287.6	50.0	0.0	KOP Build 12°/100'
11,035.3	10,765.0	-108.6	447.7	EOC

Project: Indian Hills
Site: 153N-100W-17/18
Well: Kline Federal 5300 31-18 8T
Wellbore: Kline Federal 5300 31-18 8T
Design: Design #1

OASIS PETROLEUM

WELL DETAILS: Kline Federal 5300 31-18 8T

Ground Level: 2008.0

Northing	Easting	Latitude	Longitude
407221.73	1210091.04	48° 4' 28.160 N	103° 36' 11.380 W

CASING DETAILS

TVD	MD	Name	Size
2023.0	2023.0	Surface	13-3/8
6101.0	6101.1	Dakota String	9-5/8
10765.0	11036.0	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	
2200.0	0.00	0.00	2200.0	0.0	0.0	0.00	
2216.7	0.50	0.00	2216.7	0.1	0.0	3.00	
7926.7	0.50	0.00	7926.4	49.9	0.0	0.00	
7943.3	0.00	0.00	7943.1	50.0	0.0	3.00	
10287.8	0.00	0.00	10287.6	50.0	0.0	0.00	
11035.3	89.70	109.50	10765.0	-108.6	447.7	12.00	
12010.3	89.70	90.00	10770.2	-272.9	1404.0	2.00	
20656.4	89.70	90.00	10815.5	-272.9	10050.0	0.00	PBHL

DRILLING PLAN

OPERATOR	Oasis Petroleum	**COUNTY/STATE**	McKenzie Co., ND
WELL NAME	Kline Federal 5300 31-18 8T	**RIG**	0
WELL TYPE	Horizontal Upper Three Forks		
LOCATION	NWSW 18-153N-100W Surface Location (survey plat): 2523' fsl 238' fwl		
EST. T.D.	20,656'	**GROUND ELEV:**	2008 Finished Pad Elev **Sub Height:** 25
	TOTAL LATERAL 9,620'	**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 Lime		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		9,395	(7,362)
Lodgepole		9,957	(7,924)
Lodgepole Fracture Zone		10,163	(8,130)
False Bakken		10,653	(8,620)
Upper Bakken		10,663	(8,630)
Middle Bakken		10,677	(8,644)
Lower Bakken		10,722	(8,689)
Pronghorn		10,736	(8,703)
Three Forks		10,748	(8,715)
TF Target Top		10,760	(8,727)
TF Target Base		10,770	(8,737)
Claystone		10,771	(8,738)

Dip Rate: 0.3

Max. Anticipated BHP: 4662

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' -	11,036'	Invert	9.5-10.4	40-50	30+HtHp	Circ Mud Tanks
Lateral:	11,036' -	20,656'	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#	8-3/4"	11,036'		3903	24	1500' above Dakota
Production Liner:	4-1/2"	13.5#	6"	20,656'	TOL @ 10,238'			50' above KOP

PROBABLE PLUGS, IF REQ'D:

OTHER:

	MD	TVD	FNL/FSL	FEL/FWL	S-T-R	AZI
Surface:	2,023	2,023	2523' FSL	238' FWL	SEC 18-T153N-R100W	Survey Company:
KOP:	10,288'	10,288'	2573' FSL	238' FWL	SEC 18-T153N-R100W	Build Rate: 12 deg /100'
EOC:	11,035'	10,765'	2414' FSL	686' FWL	SEC 18-T153N-R100W	109.50
Casing Point:	11,036'	10,765'	2414' FSL	686' FWL	SEC 18-T153N-R100W	109.50
Upper Threeforks Lateral TD:	20,656'	10,816'	2250' FSL	200' FEL	SEC 17-T153N-R100W	90.00

Comments:

Request a Sundry for an Open Hole Log Waiver

Exception well: Oasis Petroleum's Kline 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 (5/5/2014) **Engineering:** hlbader rpm 7/18/14

Oasis Petroleum
Well Summary
Kline Federal 5300 31-18 8T
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 8T
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' 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 8T
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' – 10,288'	32	HCP-110	LTC	6.094"	6.000***	6,730	8,970	11,210
7"	10,288' – 11,036'	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 / 2.09
6,590' – 10,288'	3,698'	7", 32#, HCP-110, LTC, 8rd	11820 / 2.20*	12460 / 1.29	
6,590' – 10,288'	3,698'	7", 32#, HCP-110, LTC, 8rd	11820 / 1.08**	12460 / 1.29	
10,288' – 11,036'	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.

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

c) Based on string weight in 10 ppg fluid, (281k 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: **617 sks** (170 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 8T
Section 18 T153N R100W
McKenzie County, ND

PRODUCTION LINER

Size	**Interval**	**Weight**	**Grade**	**Coupling**	**I.D.**	**Drift**	**Estimated Torque**
4-1/2"	10,238' – 20,656'	13.5	P-110	BTC	3.92"	3.795"	4,500

Interval	**Description**	**Collapse**	**Burst**	**Tension**
		(psi) **a**	(psi) **b**	(1000 lbs) **c**
10,238' – 20,656'	4-1/2", 13.5 lb, P-110, BTC, 8rd	10680 / 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 @ 10,816' TVD.

b) Burst pressure based on 9000 psi treating pressure with 10.2 ppg internal fluid gradient and 9 ppg external fluid gradient @ 10,816' TVD.

c) Based on string weight in 9.5 ppg fluid (Buoyed weight: 120k 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)

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
ND OIL & GAS
DIVISION
JUN 2014

Well File No.
28754

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 8T					
Footages	Qtr-Qtr	Section	Township	Range	
2523 F S L 238 F W L	**Lot 3**	**18**	**153 N**	**100 W**	
Field	Pool	County			
Baker	**1st 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	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	
Title Stephen Fried Geologist	

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 8T** Well File No.: **28754**
Location:	**LOT3 18-153-100** County: MCKENZIE
Permit Type:	**Development - HORIZONTAL**
Field:	**BAKER** Target Horizon: THREE FORKS B1

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)

Well File No. 28754

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

☑ Notice of Intent — Approximate Start Date: June 15, 2014

☐ Report of Work Done — Date Work Completed:

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

☐ Drilling Prognosis ☐ Spill Report
☐ Redrilling or Repair ☐ Shooting
☐ Casing or Liner ☐ Acidizing
☐ Plug Well ☐ Fracture Treatment
☐ Supplemental History ☐ Change Production Method
☐ Temporarily Abandon ☐ Reclamation
☑ Other NDAC 43-02-03-55 Waiver

Well Name and Number					
Kline Federal 5300 31-18 8T					
Footages	Qtr-Qtr	Section	Township	Range	
2523 F S L 238 F W L	Lot 3	18	153 N	100 W	
Field	Pool	County			
Baker	1st 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.

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

Company		Telephone Number
Oasis Petroleum North America, LLC		(281) 404-9562
Address		
1001 Fannin, Suite 1500		
City	State	Zip Code
Houston	TX	77002
Signature	Printed Name	
	Lauri M. Stanfield	
Title	Date	
Regulatory Specialist	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 8T
LOT3 Section 18-153N-100W
McKenzie County
Well File # 28754

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 8T

Surface Footages	Qtr-Qtr	Section	Township	Range	County
2523 F S L 238 F W L	LOT3	18	153 N	100 W	McKenzie

Longstring Casing Point Footages	Qtr-Qtr	Section	Township	Range	County
2414 F S L 686 F W L	LOT3	18	153 N	100 W	McKenzie

Longstring Casing Point Coordinates From Well Head	Azimuth	Longstring Total Depth
109 S From WH 448 E From WH	109 °	11036 Feet MD 10765 Feet TVD

Bottom Hole Footages From Nearest Section Line	Qtr-Qtr	Section	Township	Range	County
2250 F S L 200 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
273 S From WH 10050 E From WH	10288 Feet MD	90 °	20656 Feet MD 10816 Feet TVD

Latitude of Well Head	Longitude of Well Head	NAD Reference	Description of (Subject to NDIC Approval)
48 ° 04 ' 28.16 "	-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
2026 Feet Above S.L.	1280	500 Feet N/S 200 Feet E/W	23752

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

Objective Horizons	Pierre Shale Top
Three Forks B1	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 - "	29/32 Lb./Ft.	11036 Feet MD 10765 Feet TVD	761 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 28754	API Number 33 - 053 - 06055
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 8T"
2523 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

Q:\Work\Eng\Oasis\100100_Oasis_Petroleum - Kline_Federal_5300_31-18_8T.dwg - Plot\CAD\Kline Federal 5300 31-18 8T.dwg - 4/28/2014 11:13 AM jean.schmierer

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

Drawn By: B.H.H. Project No.: S14-09-109.02
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

SHEET NO. 1/8

DRILLING PLAN

OPERATOR	Oasis Petroleum	**COUNTY/STATE**	McKenzie Co., ND
WELL NAME	Kline Federal 5300 31-18 8T	**RIG**	0
WELL TYPE	Horizontal Upper Three Forks		
LOCATION	NWSW 18-153N-100W Surface Location (survey plat): 2523' fsl	238' fwl	
EST. T.D.	20,656'	**GROUND ELEV:**	2008 Finished Pad Elev. **Sub Height:** 25
	TOTAL LATERA 9,620'	**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 Lime		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		9,395	(7,362)
Lodgepole		9,957	(7,924)
Lodgepole Fracture Zone		10,163	(8,130)
False Bakken		10,653	(8,620)
Upper Bakken		10,663	(8,630)
Middle Bakken		10,677	(8,644)
Lower Bakken		10,722	(8,689)
Pronghorn		10,736	(8,703)
Three Forks		10,748	(8,715)
TF Target Top		10,760	(8,727)
TF Target Base		10,770	(8,737)
Claystone		10,771	(8,738)

Dip Rate: -0.3

Max. Anticipated BHP: 4662

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' -	11,036'	Invert	9.5-10.4	40-50	30+HtHp	Circ Mud Tanks
Lateral:	11,036' -	20,656'	Salt Water	9.8-10.2	28-32	NC	Circ Mud Tanks

CASING:	Size	Wt ppf	Hole	Depth		Cement	WOC	Remarks
Surface:	9-5/8"	36#	13-1/2"	2,023'		To Surface	12	100' into Pierre
Intermediate:	7"	29/32#	8-3/4"	11,036'		3903	24	1500' above Dakota
Production Liner:	4.5"	11.6#	6"	20,656'	TOL @ 10,238'			50' above KOP

PROBABLE PLUGS, IF REQ'D:

OTHER:

	MD	TVD	FNL/FSL	FEL/FWL	S-T-R	AZI
Surface:	2,023	2,023	2523' FSL	238' FWL	SEC 18-T153N-R100W	Survey Company:
KOP:	10,288'	10,288'	2573' FSL	238' FWL	SEC 18-T153N-R100W	Build Rate: 12 deg /100'
EOC:	11,035'	10,765'	2414' FSL	686' FWL	SEC 18-T153N-R100W	109.50
Casing Point:	11,036'	10,765'	2414' FSL	686' FWL	SEC 18-T153N-R100W	109.49
Upper Threeforks Lateral TD:	20,656'	10,816'	2250' FSL	200' FEL	SEC 17-T153N-R100W	90.00

Comments:

Request a Sundry for an Open Hole Log Waiver

Exception well: Oasis Petroleum's Kline 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 (5/5/2014) **Engineering:** hlbader rpm 5/29/14

Oasis Petroleum
Well Summary
Kline Federal 5300 31-18 8T
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 / 2.14	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 8T
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' – 10,288'	32	HCP-110	LTC	6.094”	6.000***	6,730	8,970	9,870
7”	10,288' – 11,036'	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' – 10,288'	3,748’	7”, 32#, HCP-110, LTC, 8rd	11820 / 2.20*	12460 / 1.29	
6,540' – 10,288'	3,748’	7”, 32#, HCP-110, LTC, 8rd	11820 / 1.07**	12460 / 1.29	
10,288' – 11,036'	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 10,765' TVD.

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

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

Pre-flush (Spacer): **170 bbls** Saltwater
20 bbls CW8 System
10 bbls Fresh Water

Lead Slurry: **177 sks** (82 bbls) Conventional system with 47 lb/sk cement, 10% NaCl, 34 lb/sk extender, 10% D020 extender, 1% D079 extender, 1% anti-settling agent, 1% fluid loss agent, 0.2% anti-foam agent, 0.7% retarder, 0.125 lb/sk lost circulation control agent, and 0.3% dispersant

Tail Slurry: **584 sks** (170 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 8T
Section 18 T153N R100W
McKenzie County, ND

PRODUCTION LINER

							Make-up Torque (ft-lbs)		
Size	**Interval**	**Weight**	**Grade**	**Coupling**	**I.D.**	**Drift**	**Minimum**	**Optimum**	**Max**
4-1/2”	10,238' – 20,656'	11.6	P-110	BTC	4.000"	3.875"			

Interval	Description	Collapse	Burst	Tension	Cost per ft
		(psi) **a**	(psi) **b**	(1000 lbs) **c**	
10,238' – 20,656'	4-1/2”, 11.6 lb, P-110, BTC, 8rd	7560 / 1.49	10690 / 1.11	385 / 1.90	

API Rating & Safety Factor

a) Based on full casing evacuation with 9.5 ppg fluid on backside @ 10,765' TVD.

b) Burst pressure based on 9000 psi treating pressure with 10.2 ppg internal fluid gradient and 9 ppg external fluid gradient @ 10,765' TVD.

c) Based on string weight in 9.5 ppg fluid (Buoyed weight: 103k lbs.) plus 100k lbs overpull.

Project: Indian Hills
Site: 153N-100W-17/18
Well: Kline Federal 5300 31-18 8T
Wellbore: Kline Federal 5300 31-18 8T
Design: Design #1

OASIS PETROLEUM

WELL DETAILS: Kline Federal 5300 31-18 8T

Ground Level: 2008.0

Northing	Easting	Latitude	Longitude
407221.73	1210091.04	48° 4' 28.160 N	103° 36' 11.380 W

CASING DETAILS

TVD	MD	Name	Size
10765.0	11036.0	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	
2200.0	0.00	0.00	2200.0	0.0	0.0	0.00	
2216.7	0.50	0.00	2216.7	0.1	0.0	3.00	
7926.7	0.50	0.00	7926.4	49.9	0.0	0.00	
7943.3	0.00	0.00	7943.1	50.0	0.0	3.00	
10287.8	0.00	0.00	10287.6	50.0	0.0	0.00	
11035.3	89.70	109.50	10765.0	-108.6	447.7	12.00	
12010.3	89.70	90.00	10770.2	-272.9	1404.0	2.00	
20656.4	89.70	90.00	10815.5	-272.9	10050.0	0.00	5300 31-18 8T PBHL

Oasis

Indian Hills
153N-100W-17/18
Kline Federal 5300 31-18 8T

Kline Federal 5300 31-18 8T

Plan: Design #1

Standard Planning Report

30 May, 2014

Planning Report

Database:	edm	**Local Co-ordinate Reference:**	Well Kline Federal 5300 31-18 8T
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 8T	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Kline Federal 5300 31-18 8T		
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 8T

Well Position	**+N/-S**	-1,744.9 usft	**Northing:**	407,221.73 usft	**Latitude:**	48° 4' 28.160 N
	+E/-W	-67.9 usft	**Easting:**	1,210,091.03 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 8T

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	
2,200.0	0.00	0.00	2,200.0	0.0	0.0	0.00	0.00	0.00	0.00	
2,216.7	0.50	0.00	2,216.7	0.1	0.0	3.00	3.00	0.00	0.00	
7,926.7	0.50	0.00	7,926.4	49.9	0.0	0.00	0.00	0.00	0.00	
7,943.3	0.00	0.00	7,943.1	50.0	0.0	3.00	-3.00	0.00	180.00	
10,287.8	0.00	0.00	10,287.6	50.0	0.0	0.00	0.00	0.00	0.00	
11,035.3	89.70	109.50	10,765.0	-108.6	447.7	12.00	12.00	0.00	109.50	
12,010.3	89.70	90.00	10,770.2	-272.9	1,404.0	2.00	0.00	-2.00	-90.05	
20,656.4	89.70	90.00	10,815.5	-272.9	10,050.0	0.00	0.00	0.00	0.00	5300 31-18 8T PBH

Database:	edm	**Local Co-ordinate Reference:**	Well Kline Federal 5300 31-18 8T
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 8T	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Kline Federal 5300 31-18 8T		
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
2,200.0	0.00	0.00	2,200.0	0.0	0.0	0.0	0.00	0.00	0.00
2,216.7	0.50	0.00	2,216.7	0.1	0.0	0.0	3.00	3.00	0.00
2,500.0	0.50	0.00	2,500.0	2.5	0.0	0.0	0.00	0.00	0.00
3,000.0	0.50	0.00	3,000.0	6.9	0.0	0.0	0.00	0.00	0.00
3,500.0	0.50	0.00	3,500.0	11.3	0.0	0.0	0.00	0.00	0.00
4,000.0	0.50	0.00	3,999.9	15.6	0.0	0.0	0.00	0.00	0.00
4,500.0	0.50	0.00	4,499.9	20.0	0.0	0.0	0.00	0.00	0.00
4,570.1	0.50	0.00	4,570.0	20.6	0.0	0.0	0.00	0.00	0.00
Greenhorn									
4,976.1	0.50	0.00	4,976.0	24.2	0.0	0.0	0.00	0.00	0.00
Mowry									
5,000.0	0.50	0.00	4,999.9	24.4	0.0	0.0	0.00	0.00	0.00
5,403.1	0.50	0.00	5,403.0	27.9	0.0	0.0	0.00	0.00	0.00
Dakota									
5,500.0	0.50	0.00	5,499.9	28.7	0.0	0.0	0.00	0.00	0.00
6,000.0	0.50	0.00	5,999.9	33.1	0.0	0.0	0.00	0.00	0.00
6,402.2	0.50	0.00	6,402.0	36.6	0.0	0.0	0.00	0.00	0.00
Rierdon									
6,500.0	0.50	0.00	6,499.8	37.5	0.0	0.0	0.00	0.00	0.00
6,740.2	0.50	0.00	6,740.0	39.5	0.0	0.0	0.00	0.00	0.00
Dunham Salt									
6,851.2	0.50	0.00	6,851.0	40.5	0.0	0.0	0.00	0.00	0.00
Dunham Salt Base									
6,948.2	0.50	0.00	6,948.0	41.4	0.0	0.0	0.00	0.00	0.00
Spearfish									
7,000.0	0.50	0.00	6,999.8	41.8	0.0	0.0	0.00	0.00	0.00
7,203.2	0.50	0.00	7,203.0	43.6	0.0	0.0	0.00	0.00	0.00
Pine Salt									
7,251.2	0.50	0.00	7,251.0	44.0	0.0	0.0	0.00	0.00	0.00
Pine Salt Base									
7,296.2	0.50	0.00	7,296.0	44.4	0.0	0.0	0.00	0.00	0.00
Opeche Salt									
7,326.2	0.50	0.00	7,326.0	44.7	0.0	0.0	0.00	0.00	0.00
Opeche Salt Base									
7,500.0	0.50	0.00	7,499.8	46.2	0.0	0.0	0.00	0.00	0.00
7,528.2	0.50	0.00	7,528.0	46.4	0.0	0.0	0.00	0.00	0.00
Broom Creek (Top of Minnelusa Gp.)									
7,608.2	0.50	0.00	7,608.0	47.1	0.0	0.0	0.00	0.00	0.00
Amsden									
7,776.2	0.50	0.00	7,776.0	48.6	0.0	0.0	0.00	0.00	0.00
Tyler									
7,926.7	0.50	0.00	7,926.4	49.9	0.0	0.0	0.00	0.00	0.00
7,943.3	0.00	0.00	7,943.1	50.0	0.0	0.0	3.00	-3.00	0.00
7,967.2	0.00	0.00	7,967.0	50.0	0.0	0.0	0.00	0.00	0.00
Otter (Base of Minnelusa Gp.)									

Database:	edm	**Local Co-ordinate Reference:**	Well Kline Federal 5300 31-18 8T
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 8T	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Kline Federal 5300 31-18 8T		
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)
8,000.0	0.00	0.00	7,999.8	50.0	0.0	0.0	0.00	0.00	0.00
8,322.2	0.00	0.00	8,322.0	50.0	0.0	0.0	0.00	0.00	0.00
Kibbey Lime									
8,472.2	0.00	0.00	8,472.0	50.0	0.0	0.0	0.00	0.00	0.00
Charles Salt									
8,500.0	0.00	0.00	8,499.8	50.0	0.0	0.0	0.00	0.00	0.00
9,000.0	0.00	0.00	8,999.8	50.0	0.0	0.0	0.00	0.00	0.00
9,096.2	0.00	0.00	9,096.0	50.0	0.0	0.0	0.00	0.00	0.00
UB									
9,171.2	0.00	0.00	9,171.0	50.0	0.0	0.0	0.00	0.00	0.00
Base Last Salt									
9,219.2	0.00	0.00	9,219.0	50.0	0.0	0.0	0.00	0.00	0.00
Ratcliffe									
9,395.2	0.00	0.00	9,395.0	50.0	0.0	0.0	0.00	0.00	0.00
Mission Canyon									
9,500.0	0.00	0.00	9,499.8	50.0	0.0	0.0	0.00	0.00	0.00
9,957.2	0.00	0.00	9,957.0	50.0	0.0	0.0	0.00	0.00	0.00
Lodgepole									
10,000.0	0.00	0.00	9,999.8	50.0	0.0	0.0	0.00	0.00	0.00
10,163.2	0.00	0.00	10,163.0	50.0	0.0	0.0	0.00	0.00	0.00
Lodgepole Fracture Zone									
10,287.8	0.00	0.00	10,287.6	50.0	0.0	0.0	0.00	0.00	0.00
KOP Build 12°/100'									
10,500.0	25.46	109.50	10,492.9	34.5	43.7	43.7	12.00	12.00	0.00
10,703.9	49.94	109.50	10,653.0	-6.8	160.4	160.4	12.00	12.00	0.00
False Bakken									
10,719.8	51.84	109.50	10,663.0	-10.9	172.0	172.0	12.00	12.00	0.00
Upper Bakken									
10,743.2	54.65	109.50	10,677.0	-17.2	189.7	189.7	12.00	12.00	0.00
Middle Bakken									
10,833.5	65.48	109.50	10,722.0	-43.3	263.3	263.3	12.00	12.00	0.00
Lower Bakken									
10,870.4	69.91	109.50	10,736.0	-54.7	295.5	295.5	12.00	12.00	0.00
Pronghorn									
10,909.8	74.64	109.50	10,748.0	-67.2	330.9	330.9	12.00	12.00	0.00
Three Forks									
10,968.3	81.66	109.50	10,760.0	-86.3	384.8	384.8	12.00	12.00	0.00
TF Target Top									
11,000.0	85.46	109.50	10,763.6	-96.8	414.5	414.5	12.00	12.00	0.00
11,035.3	89.70	109.50	10,765.0	-108.6	447.7	447.7	12.00	12.00	0.00
EOC									
11,036.0	89.70	109.49	10,765.0	-108.8	448.4	448.4	2.00	0.00	-2.00
7"									
11,500.0	89.70	100.21	10,767.5	-227.6	896.4	896.4	2.00	0.00	-2.00
11,973.0	89.70	90.75	10,770.0	-272.6	1,366.7	1,366.7	2.00	0.00	-2.00
TF Target Base									
12,000.0	89.70	90.21	10,770.1	-272.9	1,393.7	1,393.7	2.00	0.00	-2.00
12,010.3	89.70	90.00	10,770.2	-272.9	1,404.0	1,404.0	2.00	0.00	-2.00
12,164.0	89.70	90.00	10,771.0	-272.9	1,557.7	1,557.7	0.00	0.00	0.00
Claystone									
12,500.0	89.70	90.00	10,772.8	-272.9	1,893.7	1,893.7	0.00	0.00	0.00
13,000.0	89.70	90.00	10,775.4	-272.9	2,393.7	2,393.7	0.00	0.00	0.00

Database:	edm	**Local Co-ordinate Reference:**	Well Kline Federal 5300 31-18 8T
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 8T	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Kline Federal 5300 31-18 8T		
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)
13,500.0	89.70	90.00	10,778.0	-272.9	2,893.7	2,893.7	0.00	0.00	0.00
14,000.0	89.70	90.00	10,780.6	-272.9	3,393.7	3,393.7	0.00	0.00	0.00
14,500.0	89.70	90.00	10,783.2	-272.9	3,893.7	3,893.7	0.00	0.00	0.00
15,000.0	89.70	90.00	10,785.8	-272.9	4,393.7	4,393.7	0.00	0.00	0.00
15,500.0	89.70	90.00	10,788.5	-272.9	4,893.6	4,893.6	0.00	0.00	0.00
16,000.0	89.70	90.00	10,791.1	-272.9	5,393.6	5,393.6	0.00	0.00	0.00
16,500.0	89.70	90.00	10,793.7	-272.9	5,893.6	5,893.6	0.00	0.00	0.00
17,000.0	89.70	90.00	10,796.3	-272.9	6,393.6	6,393.6	0.00	0.00	0.00
17,500.0	89.70	90.00	10,798.9	-272.9	6,893.6	6,893.6	0.00	0.00	0.00
18,000.0	89.70	90.00	10,801.6	-272.9	7,393.6	7,393.6	0.00	0.00	0.00
18,500.0	89.70	90.00	10,804.2	-272.9	7,893.6	7,893.6	0.00	0.00	0.00
19,000.0	89.70	90.00	10,806.8	-272.9	8,393.6	8,393.6	0.00	0.00	0.00
19,500.0	89.70	90.00	10,809.4	-272.9	8,893.6	8,893.6	0.00	0.00	0.00
20,000.0	89.70	90.00	10,812.0	-272.9	9,393.6	9,393.6	0.00	0.00	0.00
20,656.4	89.70	90.00	10,815.5	-272.9	10,050.0	10,050.0	0.00	0.00	0.00
5300 31-18 8T 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 8T PBHL	0.00	0.00	10,815.5	-273.0	10,050.0	406,544.02	1,220,121.87	48° 4' 25.439 N	103° 33' 43.386 W
- plan misses target center by 0.1usft at 20656.4usft MD (10815.5 TVD, -272.9 N, 10050.0 E)									
- Point									

Casing Points

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
11,036.0	10,765.0	7"	7	8-3/4

Database:	edm	**Local Co-ordinate Reference:**	Well Kline Federal 5300 31-18 8T
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 8T	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Kline Federal 5300 31-18 8T		
Design:	Design #1		

Formations

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
1,923.0	1,923.0	Pierre			
4,570.1	4,570.0	Greenhorn			
4,976.1	4,976.0	Mowry			
5,403.1	5,403.0	Dakota			
6,402.2	6,402.0	Rierdon			
6,740.2	6,740.0	Dunham Salt			
6,851.2	6,851.0	Dunham Salt Base			
6,948.2	6,948.0	Spearfish			
7,203.2	7,203.0	Pine Salt			
7,251.2	7,251.0	Pine Salt Base			
7,296.2	7,296.0	Opeche Salt			
7,326.2	7,326.0	Opeche Salt Base			
7,528.2	7,528.0	Broom Creek (Top of Minnelusa Gp.			
7,608.2	7,608.0	Amsden			
7,776.2	7,776.0	Tyler			
7,967.2	7,967.0	Otter (Base of Minnelusa Gp.)			
8,322.2	8,322.0	Kibbey Lime			
8,472.2	8,472.0	Charles Salt			
9,096.2	9,096.0	UB			
9,171.2	9,171.0	Base Last Salt			
9,219.2	9,219.0	Ratcliffe			
9,395.2	9,395.0	Mission Canyon			
9,957.2	9,957.0	Lodgepole			
10,163.2	10,163.0	Lodgepole Fracture Zone			
10,703.9	10,653.0	False Bakken			
10,719.8	10,663.0	Upper Bakken			
10,743.2	10,677.0	Middle Bakken			
10,833.5	10,722.0	Lower Bakken			
10,870.4	10,736.0	Pronghorn			
10,909.8	10,748.0	Three Forks			
10,968.3	10,760.0	TF Target Top			
11,973.0	10,770.0	TF Target Base			
12,164.0	10,771.0	Claystone			

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	Local Coordinates +E/-W (usft)	Comment
10,287.8	10,287.6	50.0	0.0	KOP Build 12°/100'
11,035.3	10,765.0	-108.6	447.7	EOC

WELL LOCATION PLAT

OASIS PETROLEUM NORTH AMERICA, LLC
1001 FANNIN, SUITE 1500, HOUSTON, TX 77002
"KLINE FEDERAL 5300 31-18 8T"
2523 FEET FROM SOUTH LINE AND 238 FEET FROM WEST LINE
SECTION 18, T153N, R100W, 5th P.M., MCKENZIE COUNTY, NORTH DAKOTA

VICINITY MAP

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0 1000
1" = 1000'

✠ ⧗ – MONUMENT – RECOVERED
✠ ⧗ – MONUMENT – NOT RECOVERED

STAKED ON 4/23/14
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

Q:\Work\Eng\Oasis\100100_Oasis_Petroleum - Kline_Federal_5300_31-18_8T.dwg - Plot\CAD\Kline Federal 5300 31-18 8T.dwg - 4/28/2014 11:13 AM jean.schmierer

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

Drawn By: B.H.H. Project No.: S14-09-109.02
Checked By: D.D.K. Date: APRIL 2014

Interstate Engineering, Inc.
P.O. Box 648
425 East Main Street
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SHEET NO. 1/8

SECTION BREAKDOWN

OASIS PETROLEUM NORTH AMERICA, LLC
1001 FANNIN, SUITE 1500, HOUSTON, TX 77002
"KLINE FEDERAL 5300 31-18 8T"
2523 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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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

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

Drawn By: B.H.H. Project No.: S14-09-109.02
Checked By: D.D.K. Date: APRIL 2014

PAD LAYOUT

OASIS PETROLEUM NORTH AMERICA, LLC
1001 FANNIN, SUITE 1500, HOUSTON, TX 77002
"KLINE FEDERAL 5300 31-18 8T"
2523 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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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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OASIS PETROLEUM NORTH AMERICA, LLC
PAD LAYOUT
SECTION 18, T153N, R100W
MCKENZIE COUNTY, NORTH DAKOTA

Drawn By: B.H.H. | Project No.: S14-09-109.02
Checked By: D.D.K. | Date: APRIL 2014

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CROSS SECTIONS

OASIS PETROLEUM NORTH AMERICA, LLC
1001 FANNIN, SUITE 1500, HOUSTON, TX 77002
"KLINE FEDERAL 5300 31-18 8T"
2523 FEET FROM SOUTH LINE AND 238 FEET FROM WEST LINE
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

Drawn By: B.H.H.	Project No.: S14-09-109.02		
Checked By: D.D.K.	Date: APRIL 2014		

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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 8T"
2523 FEET FROM SOUTH LINE AND 238 FEET FROM WEST LINE
SECTION 18, T153N, R100W, 5th P.M., MCKENZIE COUNTY, NORTH DAKOTA

WELL SITE ELEVATION	2025.9
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
2523' 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

Drawn By:	B.H.H.	Project No.:	S14-09-109.02
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ACCESS APPROACH

OASIS PETROLEUM NORTH AMERICA, LLC
1001 FANNIN, SUITE 1500, HOUSTON, TX 77002
"KLINE FEDERAL 5300 31-18 8T"
2523 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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0 500
1" = 500'

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

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

MKENZIE COUNTY, NORTH DAKOTA

Drawn By: B.H.H.	Project No.: S14-09-109.02
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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.:	S14-09-109.02
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COUNTY ROAD MAP

OASIS PETROLEUM NORTH AMERICA, LLC
1001 FANNIN, SUITE 1500, HOUSTON, TX 77002
"KLINE FEDERAL 5300 31-18 8T"
2523 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.:	S14-09-109.02
Checked By:	D.D.K.	Date:	APRIL 2014

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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