North Dakota Industrial Commission Follow-up Spill Report

API Number	Well File or Facility No.
33 - 053 - 03472	20407

RECEIVED DEC 2017 ND OIL & GAS DIVISION

Operator	Telephone Number
Oasis Petroleum North America, LLC	(701)557-17-37

Address	City	State	Zip Code
6205 16th Avenue West	Williston	ND	58801

Well Name and Number or Facility Name	Field
Chalmers 5300 31-19H	Baker

Location of Well or Facility	Footages	Qtr-Qtr	Section	Township	Range	County
	F L F L	Lot3	19	153 N	100 W	McKenzie

Description of Spill Location if not on Well or Facility Site and/or Distance and Direction from Well or Facility
Grass fire near flare pit.

Directions to Site
South on HWY85 6 miles to CR4, east 2 miles, north 1 mile, east 1/4 mile, north side of rd.

Release Discovered By	Date Release Discovered	Time Release Discovered	Date Release Controlled	Time Release Controlled
Oasis Employee	July 31, 2017	1 : 00 PM	July 31, 2017	1 : 00 PM

Company Personnel Notified	How Notified	Date Notified	Time Notified
Dustin Anderson	Verbally	July 31, 2017	4 : 51 AM

Type of Incident	Root Cause of Release	Date Clean up Activities Concluded
Fire	Equipment Failure/Malfunction	August 1, 2017

Distance to Nearest Residence or Occupied Building	Distance to Nearest Fresh Water Well
1 Miles	1 Miles

Piping Specifics (If Applicable)	Size (Decimal Format)	Type	Location of Piping
	"		

Volume of Release	Oil	Saltwater	Other
	1.00 Barrels	Barrels	

Volume of Release Recovered	Oil	Saltwater	Other
		Barrels	

Was Release Contained Within Dike	If No, Was Release Contained on Well Site	If No, Was Release Contained on Facility Site or Pipeline ROW
Yes		

Areal Extent of Release if not Within Dike	Affected Medium	General Land Use
	Well/Facility Soil	Pasture

Describe Cause of Release or Fire and Other Type of Incidents, Root Causes of Release, Land Uses, and Released Substances
Water dump on production treater stuck shut causing the treater to upset and send oil to flare, the oil blew out and burned starting a grass fire next to the flare pit. Rig crew on Chalmers 2T came to location to help put it out.

Action Taken to Control Release and Clean Up Action Undertaken
Fire was extinguished by the pumper and rig crew. The sticky valve on the treater that caused it will be rebuilt. Land owner was informed.

Potential Environmental Impacts
Minimal.

Planned Future Action and/or Action Taken to Prevent Reoccurrence
The sticky valve on the treater that caused it will be rebuilt.

Where Were Recovered Liquids Disposed	Where Were Recovered Solids Disposed

Weather Conditions	Wind Speed	Wind Direction	Temperature	Skies	Estimated Cleanup Cost	Damage Value
	MPH		° F		$	$

Regulatory Agencies/Others Notified	Person Notified	Date Notified	Time Notified	Notified By
NDIC/NDDH			:	
Fee Surface Owner			:	
			:	

Federal Agency Lease Number				
BLM			:	
USFS			:	

Report Originator	Title	Date
David Arend	EH&S Representative 1	11-10-17

Signature	Date
	11-10-17

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)

OCT 2014 RECEIVED ND OIL & GAS DIVISION

CTB
Well File No. 220407-01

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

- [x] Notice of Intent — Approximate Start Date: **October 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
- [ ] Redrilling or Repair
- [ ] Casing or Liner
- [ ] Plug Well
- [ ] Supplemental History
- [ ] Temporarily Abandon
- [ ] Spill Report
- [ ] Shooting
- [ ] Acidizing
- [ ] Fracture Treatment
- [ ] Change Production Method
- [ ] Reclamation
- [x] Other **Central production facility-commingle prod**

Well Name and Number: **(see details)**

Footages	Qtr-Qtr	Section	Township	Range
F L F L		**20**	**153 N**	**100 W**

Field	Pool	County
	Bakken	**McKenzie**

24-HOUR PRODUCTION RATE

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

Name of Contractor(s)

Address	City	State	Zip Code

DETAILS OF WORK

Oasis Petroleum North America LLC requests approval to commingle oil and gas in a central production facility known as: 5300 19-20 CTB 2 with common ownership for the following wells:

Well File #28342 Chalmes 5301 44-24 2TR SESE Sec 24-153N-R101W API 3305305924
Well File #20407 Chalmers 5301 31-19H LOT3 Sec 19-153N-101W API 33005303472
Well File #28599 Chalmers 5301 44-24 3BR SESE Sec 24 153N-101W API 3305306010
Well File #28600 Chalmers 5301 44-24 4T2R SESE Sec 21 153N-101W API 3305306011

Please find the following attachments:
1. A schematic drawing of the facility which diagrms the testing, treating, routing, and transferring of production. 2. A plat showing the location of the central facility 3. Affidavit of title indicating common ownership.Oasis will allocate production measured at the central production facility to the various wells on the basis of isolated production tests utilizing oil, gas and water meters on a test seperator at the central production facility. Oasis will measure the production from each well separately each month for a minimum of three days. Oasis believes that such allocation will result in an accurate determination of production from each well. Tank vapor gas is being recovered and burned by a 98% DRE enclosed combuster

Company	Telephone Number
Oasis Petroleum North America LLC	**281-404-9591**

Address: **1001 Fannin, Suite 1500**

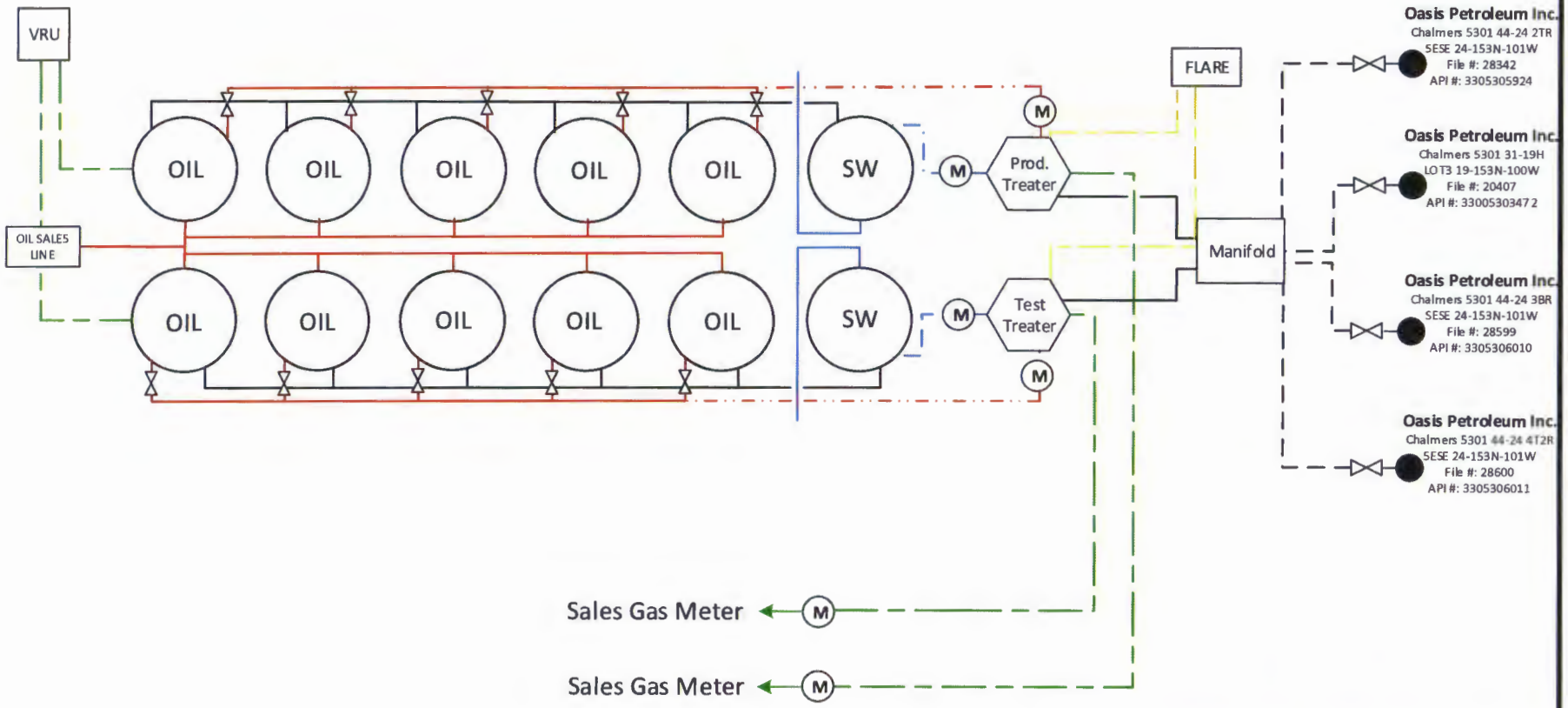
City	State	Zip Code
Houston	**TX**	**77002**

Signature: Chelsea Covington
Printed Name: **Chelsea Covington**
Title: **Regulatory Assistant**
Date: **October 13, 2014**
Email Address: **ccovington@oasispetroleum.com**

FOR STATE USE ONLY

- [ ] Received
- [x] Approved

Date: 10-17-2014
By: David Tabor
Title: **PETROLEUM ENGINEER**



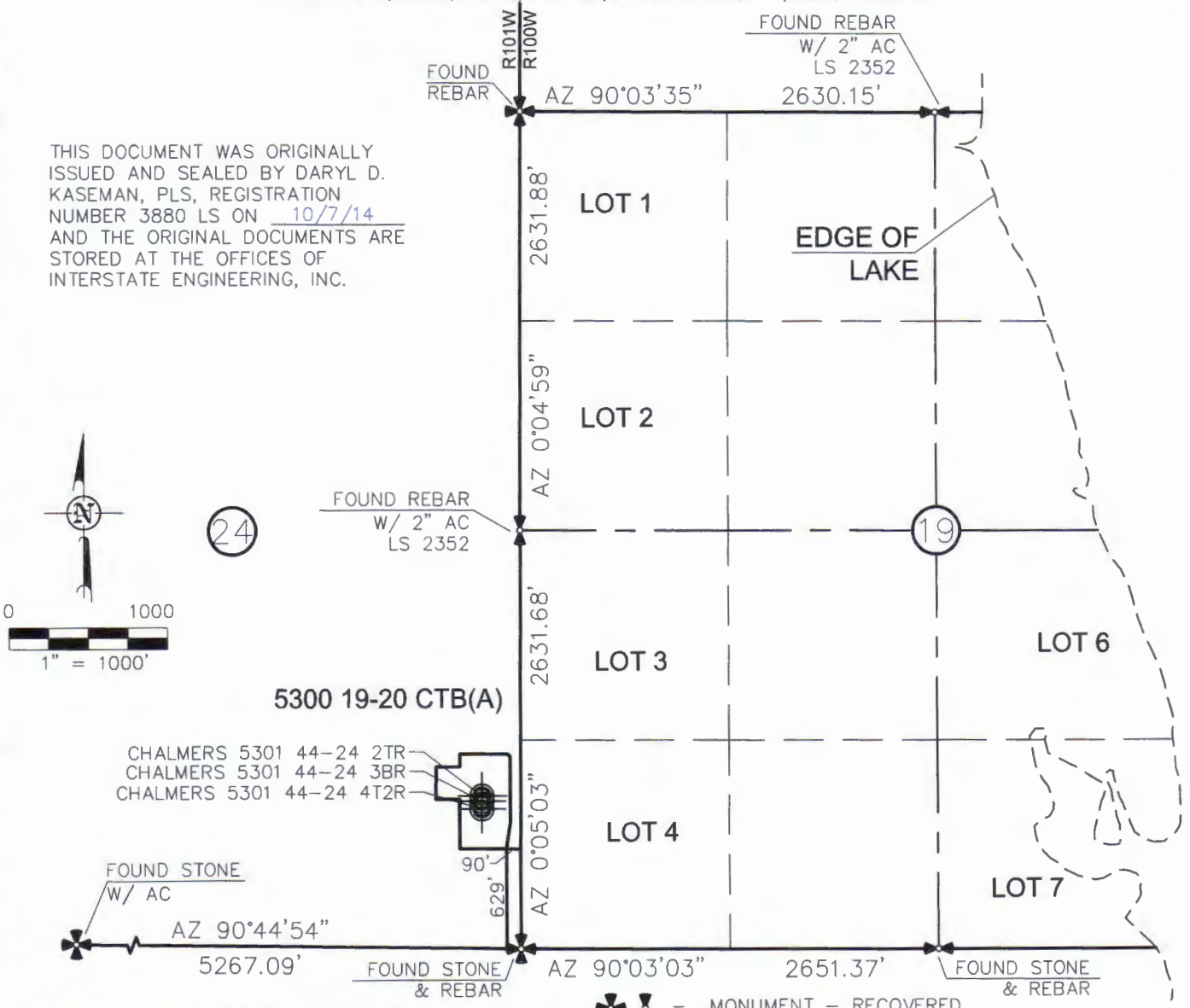
OASIS PETROLEUM

CHALMERS 5300 19-20 CENTRAL TANK BATTERY 2

DATE	REV.	BY	APPR.	SCALE
SEPTEMBER 23, 2014	0	LEE		NA
LOCATION		FIELD		
NORTH DAKOTA		BAKER		

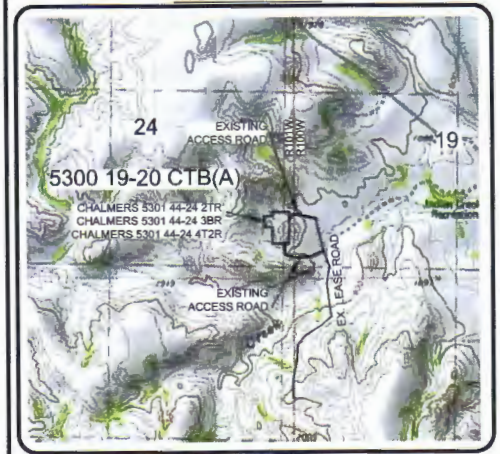
BATTERY LOCATION PLAT

OASIS PETROLEUM NORTH AMERICA, LLC
1001 FANNIN, SUITE 1500, HOUSTON, TX 77002
"5300 19-20 CTB(A)"
SECTION 24, T153N, R101W, 5TH P.M., MCKENZIE COUNTY, NORTH DAKOTA



THIS DOCUMENT WAS ORIGINALLY ISSUED AND SEALED BY DARYL D. KASEMAN, PLS, REGISTRATION NUMBER 3880 LS ON 10/7/14 AND THE ORIGINAL DOCUMENTS ARE STORED AT THE OFFICES OF INTERSTATE ENGINEERING, INC.

VICINITY MAP



- MONUMENT – RECOVERED
- MONUMENT – NOT RECOVERED

STAKED ON 9/3/2013
VERTICAL CONTROL DATUM WAS BASED UPON GPS CONTROL POINT 16 WITH AN ELEVATION OF 2014.2'

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.

REGISTERED LAND SURVEYOR
DARYL D. KASEMAN
LS-3880
DATE: 10/7/14
NORTH DAKOTA

DARYL D. KASEMAN LS-3880

1/5
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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
BATTERY LOCATION PLAT
SECTION 24, T153N, R101W
MCKENZIE COUNTY, NORTH DAKOTA

Drawn By: J.D.M. | Project No.: S14-09-241
Checked By: D.D.K. | Date: OCT. 2014

Revision No.	Date	By	Description

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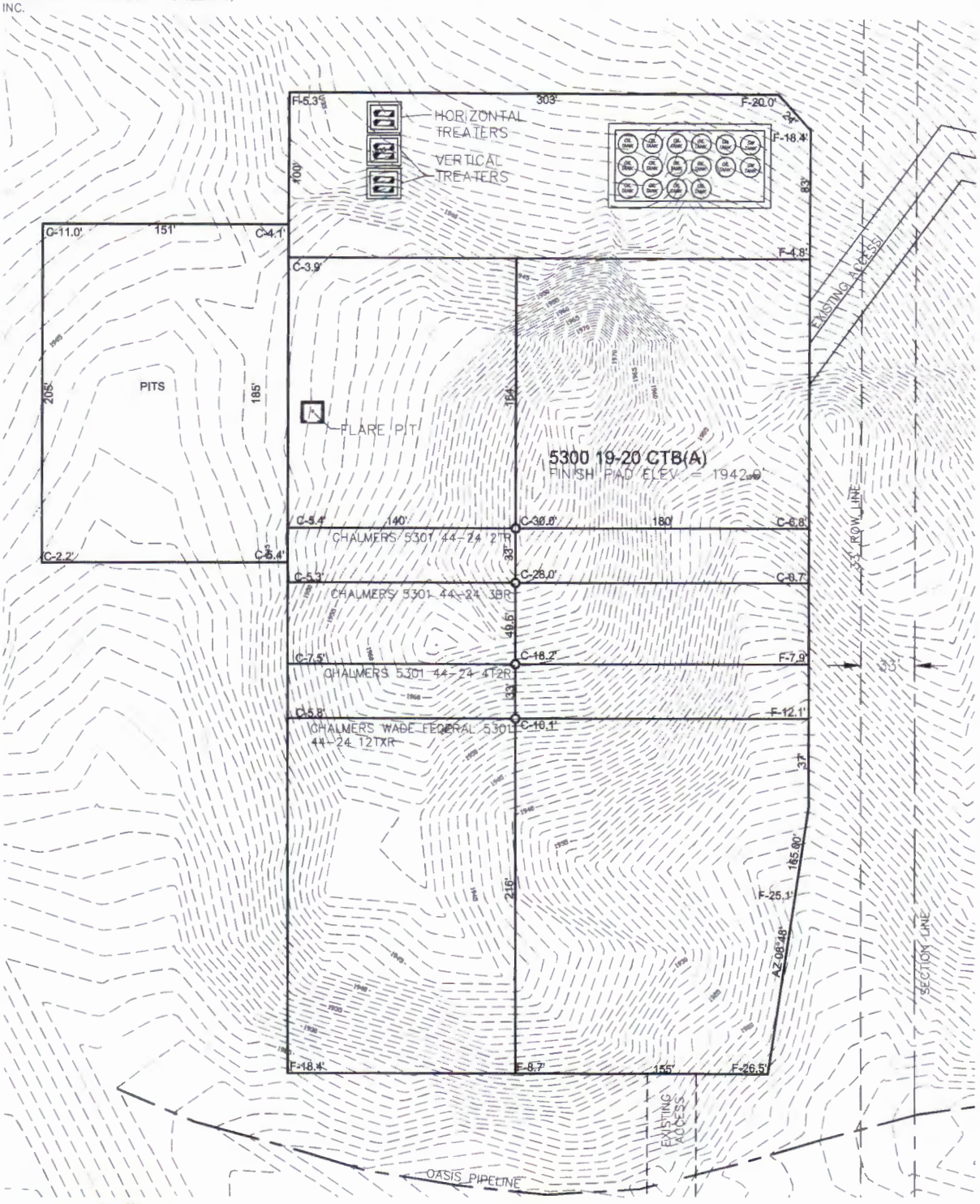
PAD LAYOUT

OASIS PETROLEUM NORTH AMERICA, LLC
1001 FANNIN, SUITE 1500, HOUSTON, TX 77002
"5300 19-20 CTB(A)"
SECTION 24, T153N, R101W, 5th P.M., MCKENZIE COUNTY, NORTH DAKOTA



REGISTERED LAND SURVEYOR
DARYL D. KASEMAN
LS-3880
DATE: 10/7/14
NORTH DAKOTA

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

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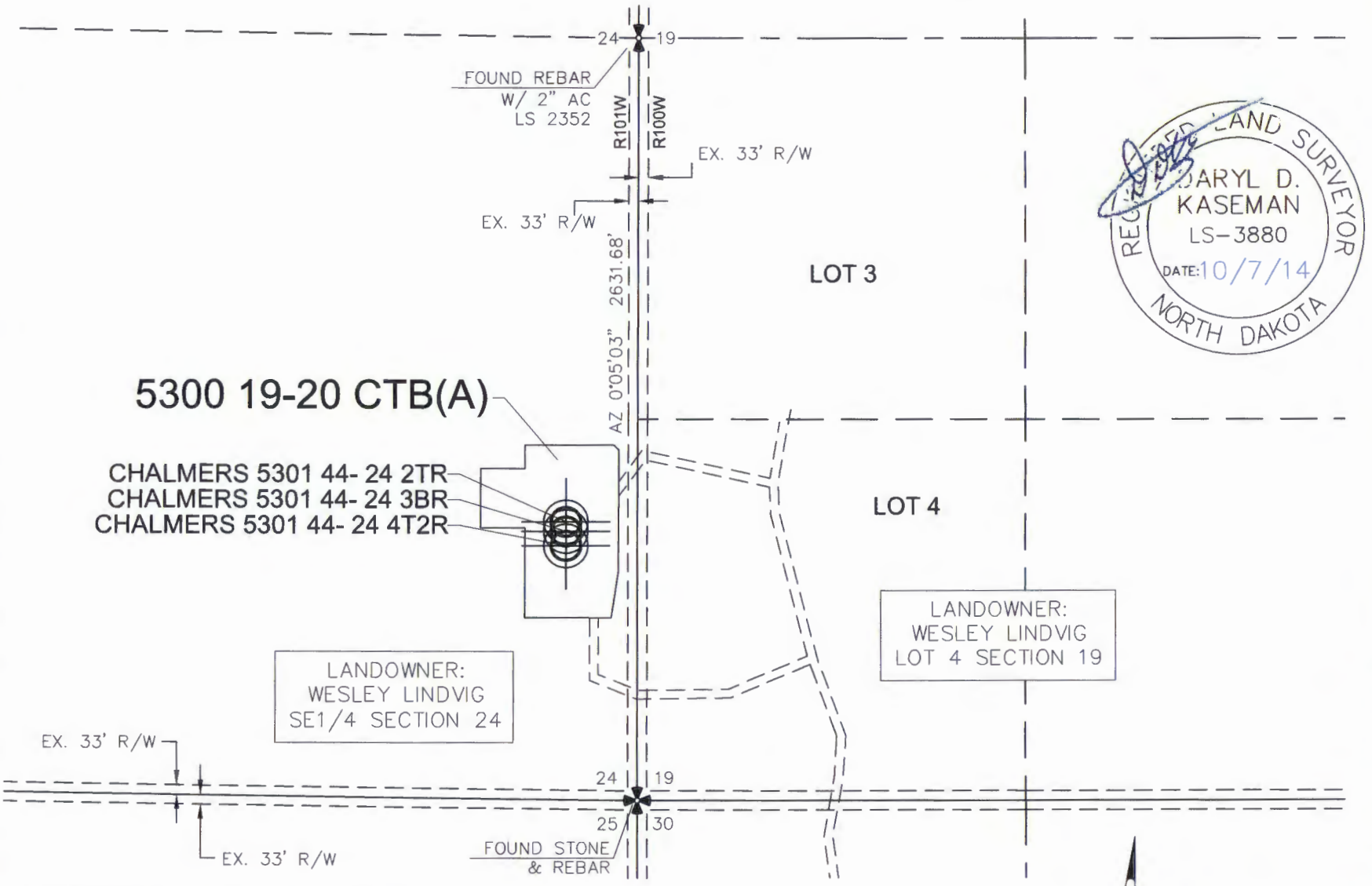
OASIS PETROLEUM NORTH AMERICA, LLC
PAD LAYOUT
SECTION 24, T153N, R101W
MCKENZIE COUNTY, NORTH DAKOTA

Drawn By: J.D.M. | Project No.: 514-09-241
Checked By: D.D.K. | Date: OCT 2014

Revision No.	Date	By	Description

ACCESS APPROACH

OASIS PETROLEUM NORTH AMERICA, LLC
1001 FANNIN, SUITE 1500, HOUSTON, TX 77002
"5300 19-20 CTB(A)"
SECTION 24, T153N, R101W, 5th P.M., MCKENZIE COUNTY, NORTH DAKOTA



REGISTERED LAND SURVEYOR
DARYL D.
KASEMAN
LS-3880
DATE: 10/7/14
NORTH DAKOTA

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

Revision No.	Date	By	Description

OASIS PETROLEUM NORTH AMERICA, LLC
ACCESS APPROACH
SECTION 24, T153N, R101W
MCKENZIE COUNTY, NORTH DAKOTA

Drawn By: J.D.M. | Project No.: S14-09-241
Checked By: D.D.K. | Date: OCT. 2014

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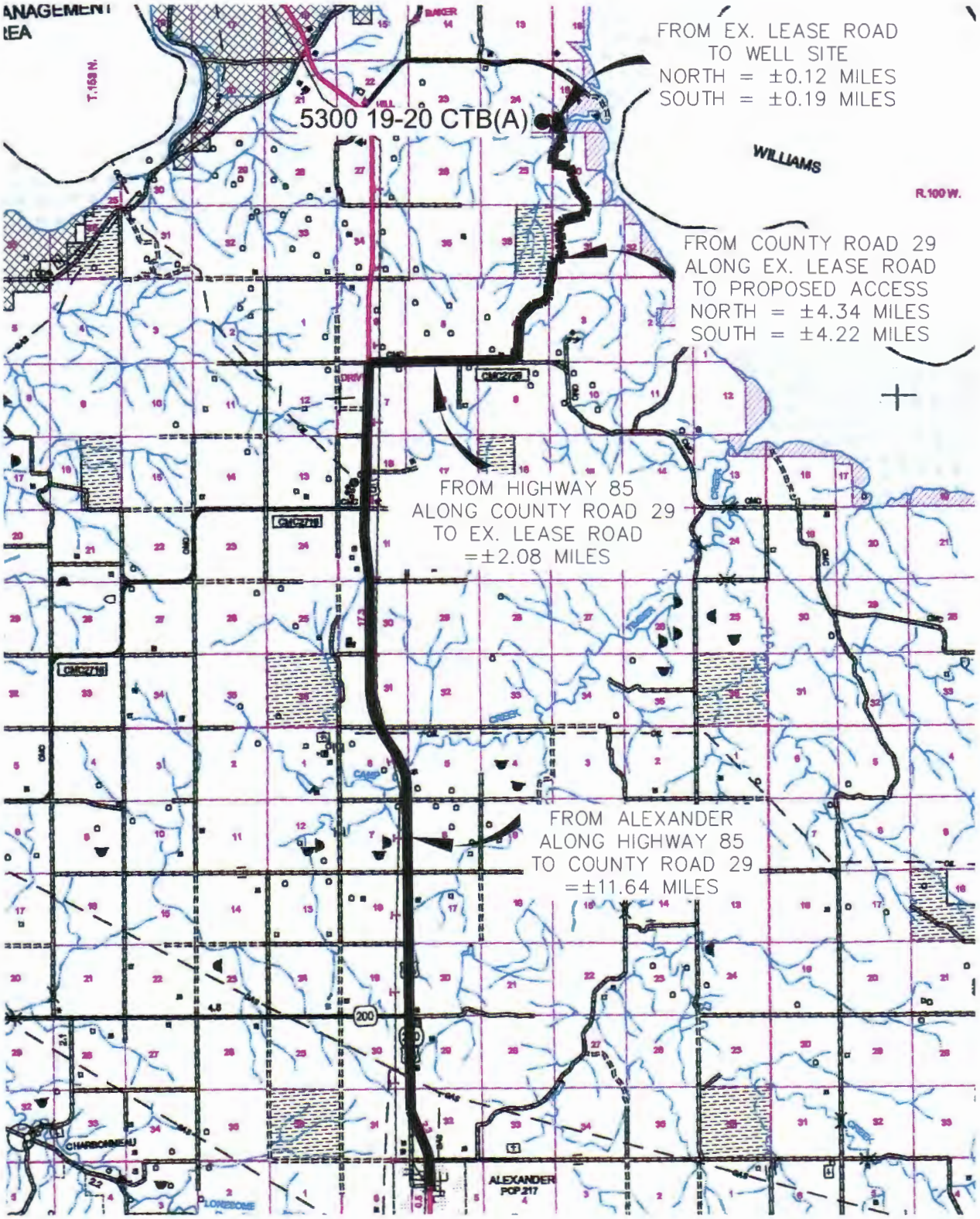
OASIS PETROLEUM NORTH AMERICA, LLC
QUAD LOCATION MAP
SECTION 24, T153N, R101W
MCKENZIE COUNTY, NORTH DAKOTA

Drawn By: J.D.M. | Project No.: S14-09-251
Checked By: D.D.K. | Date: OCT 2014

Revision No.	Date	By	Description

COUNTY ROAD MAP

OASIS PETROLEUM NORTH AMERICA, LLC
1001 FANNIN, SUITE 1500, HOUSTON, TX 77002
"5300 19-20 CTB(A)"
SECTION 24, T153N, R101W, 5th P.M., MCKENZIE COUNTY, NORTH DAKOTA



SCALE: 1" = 2 MILE

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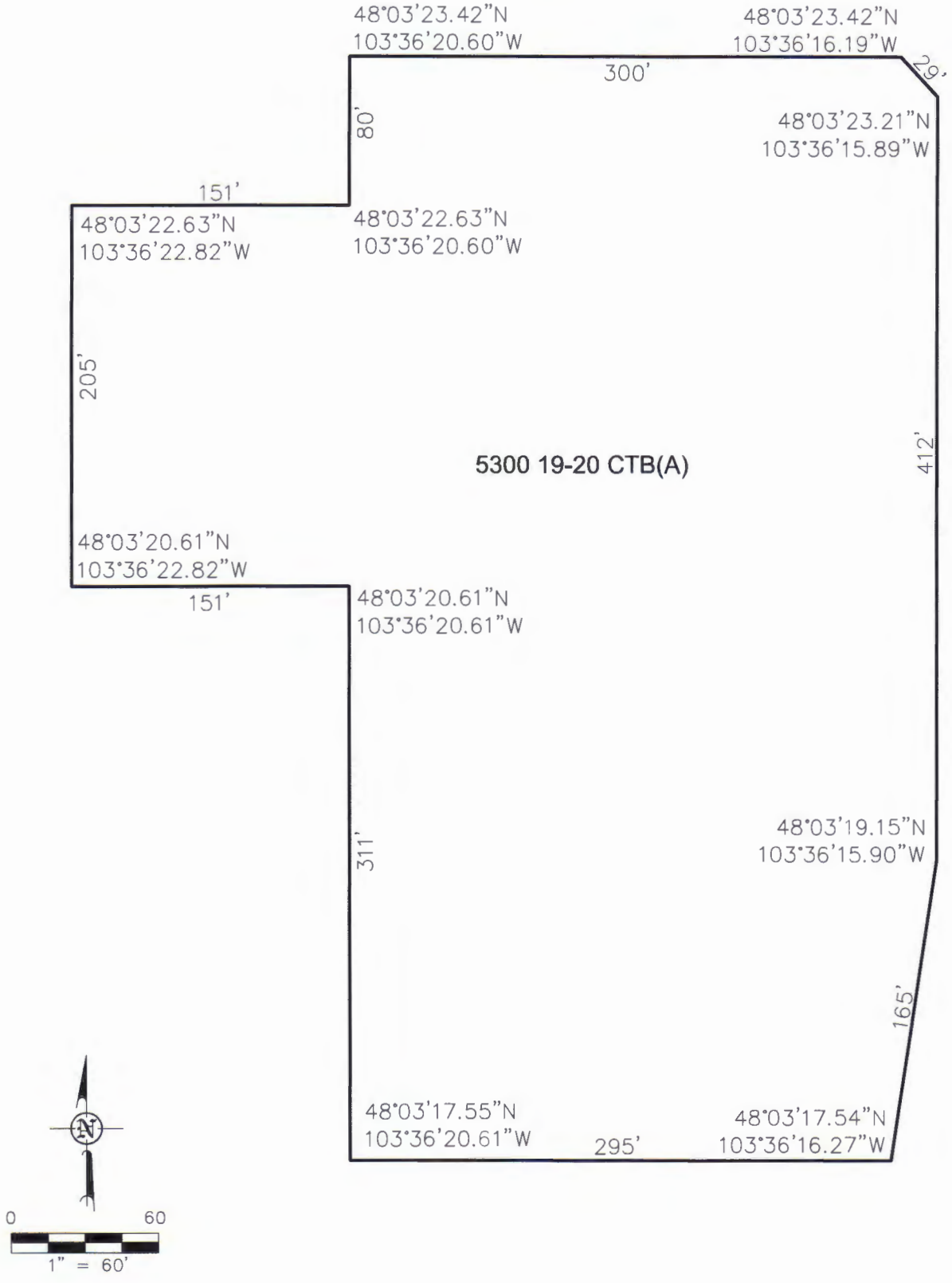
OASIS PETROLEUM NORTH AMERICA, LLC
COUNTY ROAD MAP
SECTION 24, T153N, R101W
MCKENZIE COUNTY, NORTH DAKOTA

Drawn By: J.D.M. | Project No.: S14-09-241
Checked By: D.D.K. | Date: OCT 2014

Revision No.	Date	By	Description

LAT/LONG PAD CORNERS



COMMINGLING AFFIDAVIT

STATE OF NORTH DAKOTA)
) ss.
COUNTY OF WILLIAMS)

The under signed, Alexandra Haley, of lawful age, being first duly sworn on her oath states that she is a duly authorized agent of Oasis Petroleum North America LLC, and that she has personal knowledge of the facts hereinafter set forth to make this Affidavit.

1. Sections 19 & 20, Township 153 North, Range 100 West, Williams County North Dakota constitute a spacing unit in accordance with the applicable orders for the Bakken pool.

2. Three wells have been drilled in the spacing unit, which are known as the Chalmers 5300 44-24 2TR, Chalmers 5300 44-24 3BR, and Chalmers 5300 44-24 4T2R.

3. By NDIC Order 19005 dated May 11, 2012 and recorded in Williams County as Document No. 737164, all oil and gas interest within the aforementioned spacing unit were pooled.

4. All Working Interests, Royalty Interests and Overriding Royalty Interests in the Chalmers 5300 44-24 2TR, Chalmers 5300 44-24 3BR, and Chalmers 5300 44-24 4T2R will be in common.

Dated this 15th day of September, 2014

Alexandra Haley
Landman

STATE OF TEXAS)
) ss.
COUNTY OF HARRIS)

Subscribed to and sworn before me this 15th day of September, 2014

JEFFREY E. THOMPSON
Notary Public, State of Texas
My Commission Expires
February 14, 2018

Notary Public
State of Texas
My Commission Expires: 2-14-18

Industrial Commission of North Dakota
Oil and Gas Division
Spill / Incident Report

Date/Time Reported : Jan 15 2014 / 16:51
State Agency person :
Responsible Party : Oasis Petroleum
Well Operator : OASIS PETROLEUM NORTH AMERICA LLC
Date/Time of Incident : 1/15/2014 12:00:00 AM
NDIC File Number : 20407
Facility Number : 15093
Well or Facility Name : CHALMERS 5300 31-19H
Type of Incident : Tank Overflow
Field Name : BAKER
County : MCKENZIE
Section : 19
Township : 153
Range : 100
Quarter-Quarter :
Quarter :
Distance to nearest residence : 2 Miles
Distance to nearest water well : 2 Miles
Release Oil : 25 barrels
Release Brine : 0 barrels
Release Other : 0 barrels
Recovered Oil : 25 barrels
Recovered Brine : 0 barrels
Recovered Other : 0 barrels
Has/Will the incident be reported to the NRC? : Unknown
Was release contained : Yes - Within Dike
Description of other released substance :

Immediate risk evaluation : none
Followup Report Requested Y/N : N

20407

ASTRO-CHEM LAB, INC.

4102 2nd Ave. West
Williston, North Dakota 58802-0972
P.O. Box 972
Phone. (701) 572-7355

NATURAL GAS ANALYSIS

COMPANY Oasis Petroleum

LEASE Chalmers 5300 31-19H

DATE SAMPLED 12-10-11

SAMPLE SOURCE

SAMPLE NUMBER G-11-6851

TYPE OF ANALYSIS GAS

FORMATION

LOCATION Lot 3 SECTION 19 TOWNSHIP 153N RANGE 100W

DISTRIBUTION Distribution List

DATE OF ANALYSIS 12-14-11

TEMPERATURE 132 °F

PRESSURE 44 PSI

SAMPLED BY EE

ANALYSIS BY BK

INTERVAL

COMPONENT	MOLE %	GPM
Nitrogen	1.82	0.000
Methane	48.12	0.000
Carbon Dioxide	0.41	0.000
Ethane	21.14	5.644
H2S	0.00	0.000
Propane	14.18	3.888
i-Butane	1.79	0.583
n-Butane	5.19	1.943
i-Pentane	1.39	0.506
n-Pentane	2.23	0.803
Hexanes+	2.73	1.195
Oxygen/Argon	0.00	0.000
Total	100.00	14.563

CALCULATED SPECIFIC GRAVITY 1.0656 (Air =1.0000)

CALCULATED GROSS BTU/ft³ 1739 (Saturated) 1770 (Dry) at 14.73 psi and 60°F

REMARKS McKenzie County, ND

Case # 19791
March 27, 2013
Exhibit E-7

20407

ASTRO-CHEM LAB, INC.

4102 2nd Ave. West
Williston, North Dakota 58802-0972
P.O. Box 972
Phone: (701) 572-7355

WATER ANALYSIS REPORT

SAMPLE NUMBER W-11-6849 DATE OF ANALYSIS 12-29-11

COMPANY Oasis Petroleum

CITY Williston STATE ND

WELL NAME AND/OR NUMBER Chalmers 5300 31-19H

DATE RECEIVED 12-12-11 DST NUMBER

SAMPLE SOURCE

LOCATION Lot3 OF SEC. 19 TWN. 153N RANGE 100W COUNTY McKenzie

FORMATION DEPTH

DISTRIBUTION Distribution List

RESISTIVITY @ 77°F = 0.043 Ohm-Meters pH = 5.36

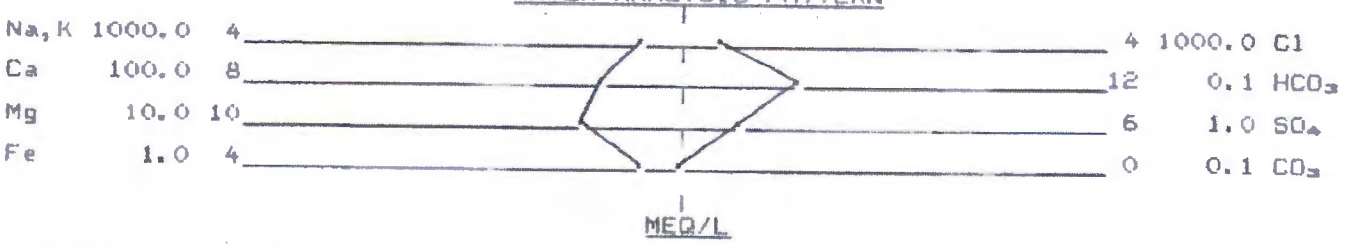
SPECIFIC GRAVITY @ 77°F = 1.180 H_2S = Negative

TOTAL DISSOLVED SOLIDS (CALCULATED) = 262831 mg/L (222738 ppm)

SODIUM CHLORIDE (CALCULATED) = 259288 mg/L (219735 ppm)

CATION	MEQ/L	mg/L	ANION	MEQ/L	mg/L
CALCIUM	840.0	16666	CHLORIDE	4435.2	157241
MAGNESIUM	100.0	1111	CARBONATE	0.0	0
SODIUM	3549.4	81600	BICARBONATE	1.2	73
IRON	3.9	72.0	SULFATE	6.3	305
CHROMIUM	0.1	0.6	NITRATE	0.0	0
BARIUM	0.5	32.4			
POTASSIUM	146.6	5730			

WATER ANALYSIS PATTERN



REMARKS Sampled 12-10-11 by EE

ANALYZED BY: C. Jungels

Case # 19791
March 27, 2013
Exhibit E-8

20407

ASTRO-CHEM LAB, INC.

4102 2nd Ave. West
Williston, North Dakota 58802 0972
P.O. Box 972
Phone: (701) 572-7355

OIL ANALYSIS REPORT

SAMPLE NUMBER O-11-6850 DATE OF ANALYSIS 1-16-12

COMPANY Oasis Petroleum

CITY Williston STATE ND

WELL NAME Chlamers 5300 31 19H

DATE RECEIVED 12-12-11 DST NUMBER

SAMPLE SOURCE Treater

FORMATION DEPTH

LOCATION Lot 3 SECTION 19 TOWNSHIP 153N RANGE 100W

DISTRIBUTION Distribution List

Specific Gravity	: 0.8289	at 60/60 °F
API Gravity	: 39.2	at 60 °F
Salt Content	: 5	lbs/1000 bbls
Pour Point	: <-40	°F
Viscosity	: 3.18	Kinematic cSt at 100 °F
	36.5	Saybolt Universal Seconds at 100 °F
Total Sulfur	: 0.11	% by Weight
BS&W	: 0.1	% in Gross Sample
	0.1	% in Sample as Analyzed
Paraffin	: 1.36	% by Weight

REMARKS Sampled 12-10-11 by EE Service

ANALYZED BY:

Case # 19791
March 27, 2013
Exhibit E-6

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.
20407

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

☐ Notice of Intent	Approximate Start Date	☐ Drilling Prognosis	☐ Spill Report
☑ Report of Work Done	Date Work Completed: **June 27, 2012**	☐ 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 **Reserve pit reclamation**	

Well Name and Number					
Chalmers 5300 31-19H					
Footages	Qtr-Qtr	Section	Township	Range	
1535 F S L 375 F W L	**LOT3**	**19**	**153 N**	**100 W**	
Field	Pool	County			
Wildcat	**Bakken**	**McKenzie**			

24-HOUR PRODUCTION RATE

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

Name of Contractor(s)			
Excel Industries			
Address	City	State	Zip Code
P. O. Box 159	**Miles City**	**MT**	**59301**

DETAILS OF WORK

Oasis Petroleum North America LLC has completed the reclamation of the reserve pit for the above referenced well as follows:
The NDIC field inspector, Mark Binns and the landowner were notified of our intent to reclaim this pit.
Surface owners: Wesley G and Barbara J Lindvig, 14075 41st Street NW, Williston, ND 58801
Fluids from the pit were hauled to the Oasis Petroleum, Belle SWD 5503 43-1 (NDIC 90147). All fluid was drained from pit. Cuttings were mixed with clay to solidify. Location was sloped and contoured to ensure proper drainage.

Company		Telephone Number
Oasis Petroleum North America LLC		**281-404-9491**
Address		
1001 Fannin, Suite 1500		
City	State	Zip Code
Houston	**TX**	**77002**
Signature	Printed Name	
	Brandi Terry	
Title	Date	
Regulatory Specialist	**July 18, 2012**	
Email Address		
bterry@oasispetroleum.com		

FOR STATE USE ONLY

☑ Received	☐ Approved
Date: 9-4-12	
By:	
Title:	

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)

APR 2012
RECEIVED
ND OIL & GAS
DIVISION

Well File No.
20407

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		Spacing Unit Description
Chalmers 5300 31-19H		**Sec. 19 T153N R100W** ad Sec 20
Operator: **Oasis Petroleum North America LLC**	Telephone Number: **281-404-9500**	Field: **Squiers**
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
1535 F S L 375 F W L	**LOT3**	**19**	**153 N**	**100 W**	**McKenzie**

Spud Date	Date TD Reached	Drilling Contractor and Rig Number	KB Elevation (Ft)	Graded Elevation (Ft)
9/1/2011	**10/19/2011**		**1930**	**1904**

Type of Electric and Other Logs Run (See Instructions)

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**	**9 5/8**		**1895**	**13 1/2**	**36**			**467**	
Vertical Hole	**Intermediate**	**7**		**10882**	**8 3/4**	**29 & 32**			**727**	**5040**
Lateral1	**Liner**	**4 1/2**	**10034**	**20290**						

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	~~20300~~	**Perforations**	**10882**	~~20300~~	**10091**		**11/17/2011**			
	13267			13267						
Sidetrack1	20300		13001	20300						

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 - 10882'-20300'								
Date Well Completed (SEE INSTRUCTIONS)		Producing Method		Pumping-Size & Type of Pump			Well Status (Producing or Shut-In)	
11/26/2011		**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
12/12/2012	24	**24 /64**		**1395**	**882**	**1076**	**40.8 °**	
Flowing Tubing Pressure (PSI)	Flowing Casing Pressure (PSI)		Calculated 24-Hour Rate	Oil (Bbls)	Gas (MCF)	Water (Bbls)	Gas-Oil Ratio	
	1200			**1395**	**882**	**1076**	**632**	

orig.

GEOLOGICAL MARKERS

Formation	MD (Ft)	TVD (Ft)
Kibby	8225	8225
Charles Salt	8376	8376
Base Charles Salt	9043	9043
Mission Canyon	9281	9281
Lodgepole	9839	9839
False Bakken	10696	10550
Upper Shale	10736	10566
Middle Bakken	10806	10583

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
11/17/2011	Bakken	10882	20300	36	74826	Barrels

Type Treatment	Acid %	Lbs Proppant	Maximum Treatment Pressure (PSI)	Maximum Treatment Rate (BBLS/Min)
Sand Frac		4539124	8672	41.2

Details
40/70 white- 1818580
20/40 ceramic- 2720544

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

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

Details

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

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

Details

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

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

Details

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

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

Details

ADDITIONAL INFORMATION AND/OR LIST OF ATTACHMENTS

I hereby swear or affirm that the information provided is true, complete and correct as determined from all available records.	Email Address bkunnemann@oasispetroleum.com	Date 3/23/2012
Signature Brittany Kunnemann	Printed Name **Brittany Kunnemann**	Title **Operations Assistant**

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 2012
RECEIVED
ND OIL & GAS DIVISION

Well File No.
20407

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

☐ Notice of Intent	Approximate Start Date	☐ Drilling Prognosis	☐ Spill Report
☑ Report of Work Done	Date Work Completed **February 3, 2012**	☐ Redrilling or Repair	☐ Shooting
☐ Notice of Intent to Begin a Workover Project that may Qualify for a Tax Exemption Pursuant to NDCC Section 57-51.1-03.	Approximate Start Date	☐ Casing or Liner	☐ Acidizing
		☐ Plug Well	☐ Fracture Treatment
		☐ Supplemental History	☐ Change Production Method
		☐ Temporarily Abandon	☐ Reclamation
		☑ Other	**Well is now on pump**

Well Name and Number					
Chalmers 5300 31-19H					
Footages		Qtr-Qtr	Section	Township	Range
1535 F **S** L	**375** F **W** L	**LOT3**	**19**	**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 February 3, 2012 Chalmers 5300 31-19H is now on pump.

Tubing: 2-7/8" L-80 tubing @ 9,939'

Pump: 2.5"x2"x24' RHBM pump @ 9,877'

Please submit Completion Report + Form 6 BSM

Company			Telephone Number
Oasis Petroleum North America LLC			**281-404-9500**
Address			
1001 Fannin, Suite 1500			
City	State	Zip Code	
Houston	**TX**	**77002**	
Signature	Printed Name		
Brittany Kunnemann	**Brittany Kunnemann**		
Title	Date		
operations assistant	**February 17, 2012**		
Email Address			
bkunnemann@oasispetroleum.com			

FOR STATE USE ONLY

☒ Received	☐ Approved
Date: February 22, 2012	
By:	
Title: PETROLEUM ENGINEER	

TH

AUTHORIZATION TO PURCHASE AND TRANSPORT OIL FROM LEASE - FORM 8

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

RECEIVED
DEC 2011
ND OIL & GAS DIVISION

Well File No.
20407
NDIC CTB No.
20407

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

Well Name and Number	Qtr-Qtr	Section	Township	Range	County
CHALMERS 5300 31-19H	LOT 3	19	153 N	100 W	MCKENZIE

Operator	Telephone Number	Field
OASIS PETROLEUM NORTH AMERICA LLC	(281) 404-9435	~~WILDCAT~~ Baker

Address	City	State	Zip Code
1001 FANNIN, STE 1500	HOUSTON	TX	77002

Name of First Purchaser	Telephone Number	% Purchased	Date Effective
OASIS PETROLEUM MARKETING LLC	(281) 404-9435	100	January 1, 2012

Principal Place of Business	City	State	Zip Code
1001 FANNIN, STE 1500	HOUSTON	TX	77002

Field Address	City	State	Zip Code

Name of Transporter	Telephone Number	% Transported	Date Effective
GRIZZLY MOUNTAIN TRUCKING	(406) 377-6831	75	December 18, 2011

Address	City	State	Zip Code
54 HWY 16	GLENDIVE	MT	59330

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
CONCORD ENERGY TRANSPORT	12.5	January 1, 2012

Other Transporters Transporting From This Lease	% Transported	Date Effective
WIND RIVER TRUCKING LLC	12.5	January 1, 2012

Comments
REVISED 1ST PURCHASER EFFECTIVE 1/1/2012

I hereby swear or affirm that the information provided is true, complete and correct as determined from all available records. Date: December 21, 2011

Signature	Printed Name	Title
Dina Barron	DINA BARRON	MKTG CONTRACTS ADMINISTRATOR

Above Signature Witnessed By

Witness Signature	Witness Printed Name	Witness Title
	GARY BURLESON	MARKETING DIRECTOR

FOR STATE USE ONLY

Date Approved	JAN - 4 2012
By	Evie Peterson
Title	Oil & Gas Production Analyst

ORIGINAL

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)

RECEIVED
DEC 2011
ND OIL & GAS DIVISION

Well File No.
20407
NDIC CTB No.

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

Well Name and Number	Qtr-Qtr	Section	Township	Range	County
CHALMERS 5300 31-19H	LOT 3	19	153 N	100 W	MCKENZIE

Operator	Telephone Number	Field
OASIS PETROLEUM NORTH AMERICA LLC	(281) 404-9435	~~WILDCAT~~ Baker

Address	City	State	Zip Code
1001 FANNIN, STE 1500	HOUSTON	TX	77002

Name of First Purchaser	Telephone Number	% Purchased	Date Effective
High Sierra Crude Oil & Marketing, LLC	(303) 319-3259	75	December 18, 2011

Principal Place of Business	City	State	Zip Code
3773 CHERRY CREEK NORTH, STE 1000	DENVER	CO	80209

Field Address	City	State	Zip Code

Name of Transporter	Telephone Number	% Transported	Date Effective
GRIZZLY MOUNTAIN TRUCKING	(406) 377-6831	75	December 18, 2011

Address	City	State	Zip Code
54 HWY 16	GLENDIVE	MT	59330

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
CONCORD ENERGY	25	December 18, 2011
Other First Purchasers Purchasing From This Lease	% Purchased	Date Effective
Other Transporters Transporting From This Lease	% Transported	Date Effective
CONCORD ENERGY TRANSPORT	12.5	December 18, 2011
Other Transporters Transporting From This Lease	% Transported	Date Effective
WIND RIVER TRUCKING LLC	12.5	December 18, 2011

Comments
REVISED TO ADD ALTERNATE TRANSPORTER EFFECTIVE 12/18/2011

I hereby swear or affirm that the information provided is true, complete and correct as determined from all available records. Date: December 18, 2011

Signature	Printed Name	Title
Dina Barron	DINA BARRON	MKTG CONTRACTS ADMINISTRATOR

Above Signature Witnessed By

Witness Signature	Witness Printed Name	Witness Title
Gary Burleson	GARY BURLESON	MARKETING DIRECTOR

ORIGINAL

FOR STATE USE ONLY

Date Approved	JAN - 4 2012
By	Erin Peterson
Title	Oil & Gas Production Analyst

TH

AUTHORIZATION TO PURCHASE AND TRANSPORT OIL FROM LEASE - FORM 8

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

RECEIVED
DEC 2011
ND OIL & GAS DIVISION

Well File No.
20407
NDIC CTB No. 120407

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

Well Name and Number	Qtr-Qtr	Section	Township	Range	County
CHALMERS 5300 31-19H	LOT 3	19	153 N	100 W	MCKENZIE

Operator	Telephone Number	Field
OASIS PETROLEUM NORTH AMERICA LLC	(281) 404-9435	~~WILDCAT~~ Baker

Address	City	State	Zip Code
1001 FANNIN, STE 1500	HOUSTON	TX	77002

Name of First Purchaser	Telephone Number	% Purchased	Date Effective
High Sierra Crude Oil & Marketing, LLC	(303) 319-3259	75	December 1, 2011

Principal Place of Business	City	State	Zip Code
3773 CHERRY CREEK NORTH, STE 1000	DENVER	CO	80209
Field Address	City	State	Zip Code

Name of Transporter	Telephone Number	% Transported	Date Effective
GRIZZLY MOUNTAIN TRUCKING	(406) 377-6831	75	December 1, 2011

Address	City	State	Zip Code
54 HWY 16	GLENDIVE	MT	59330

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
CONCORD ENERGY	25	December 1, 2011
Other First Purchasers Purchasing From This Lease	% Purchased	Date Effective
Other Transporters Transporting From This Lease	% Transported	Date Effective
CONCORD ENERGY TRANSPORT	25	December 1, 2011
Other Transporters Transporting From This Lease	% Transported	Date Effective

Comments
REVISED TO ADD ALTERNATE PURCHASER/TRANSPORTER EFFECTIVE 12/1/2011

I hereby swear or affirm that the information provided is true, complete and correct as determined from all available records.		Date
		December 1, 2011
Signature: Dina Barron	Printed Name: DINA BARRON	Title: MKTG CONTRACTS ADMINISTRATOR

Above Signature Witnessed By

Witness Signature	Witness Printed Name	Witness Title
Gary Burleson	GARY BURLESON	MARKETING DIRECTOR

ORIGINAL

FOR STATE USE ONLY

Date Approved	DEC 12 2011
By	Evie Roberson
Title	~~Oil & Gas Production Analyst~~

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)

RECEIVED NOV 2011 ND OIL & GAS DIVISION

Well File No.
20407
NDIC CTB No.
120407

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

Well Name and Number	Qtr-Qtr	Section	Township	Range	County
CHALMERS 5300 31-19H	LOT 3	19	153 N	100 W	MCKENZIE

Operator	Telephone Number	Field
OASIS PETROLEUM NORTH AMERICA LLC	(281) 404-9435	~~WILDCAT~~ BAKER

Address	City	State	Zip Code
1001 FANNIN, STE 1500	HOUSTON	TX	77002

Name of First Purchaser	Telephone Number	% Purchased	Date Effective
High Sierra Crude Oil & Marketing, LLC	(303) 319-3259	100	November 18, 2011

Principal Place of Business	City	State	Zip Code
3773 CHERRY CREEK NORTH, STE 1000	DENVER	CO	80209

Field Address	City	State	Zip Code

Name of Transporter	Telephone Number	% Transported	Date Effective
GRIZZLY MOUNTAIN TRUCKING	(406) 377-6831	100%	November 18, 2011

Address	City	State	Zip Code
54 HWY 16	GLENDIVE	MT	59330

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
Other Transporters Transporting From This Lease	% Transported	Date Effective

Comments

I hereby swear or affirm that the information provided is true, complete and correct as determined from all available records. Date: November 18, 2011

Signature	Printed Name	Title
Dina Barron	DINA BARRON	MKTG CONTRACTS ADMINISTRATOR

Above Signature Witnessed By

Witness Signature	Witness Printed Name	Witness Title
Gary Burleson	GARY BURLESON	MARKETING DIRECTOR

FOR STATE USE ONLY

Date Approved	DEC 05 2011
By	
Title	Evie Peterson Oil & Gas Production Analyst

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

Well or Facility No **20407**

Tight Hole **Yes**

TH

OPERATOR

Operator	Representative	Rep Phone
OASIS PETROLEUM NORTH AMERICA LL	**Todd Samson**	**(701) 572-0293**

WELL INFORMATION

Well Name: **CHALMERS 5300 31-19H**

Inspector: **Marc Binns**

Well Location	QQ	Sec	Twp		Rng		County
	LOT3	**19**	**153**	**N**	**100**	**W**	**MCKENZIE**

Field: **WILDCAT**

Footages		
1535	Feet From the **S**	Line
375	Feet From the **W**	Line

Pool:

Date of First Production Through Permanent Wellhead **12/1/2011** **This Is Not The First Sales**

PURCHASER / TRANSPORTER

Purchaser	Transporter
HIGH SIERRA CRUDE OIL MARKETING, L	**GRIZZLY MOUNTAIN TRUCKING LLC**

TANK BATTERY

Single Well Tank Battery Number :

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

ESTIMATED BARRELS TO BE SOLD	ACTUAL BARRELS SOLD	DATE
10000 BBLS	BBLS	
BBLS	BBLS	
BBLS	BBLS	
BBLS	BBLS	
BBLS	BBLS	
BBLS	BBLS	
BBLS	BBLS	
BBLS	BBLS	
BBLS	BBLS	

DETAILS

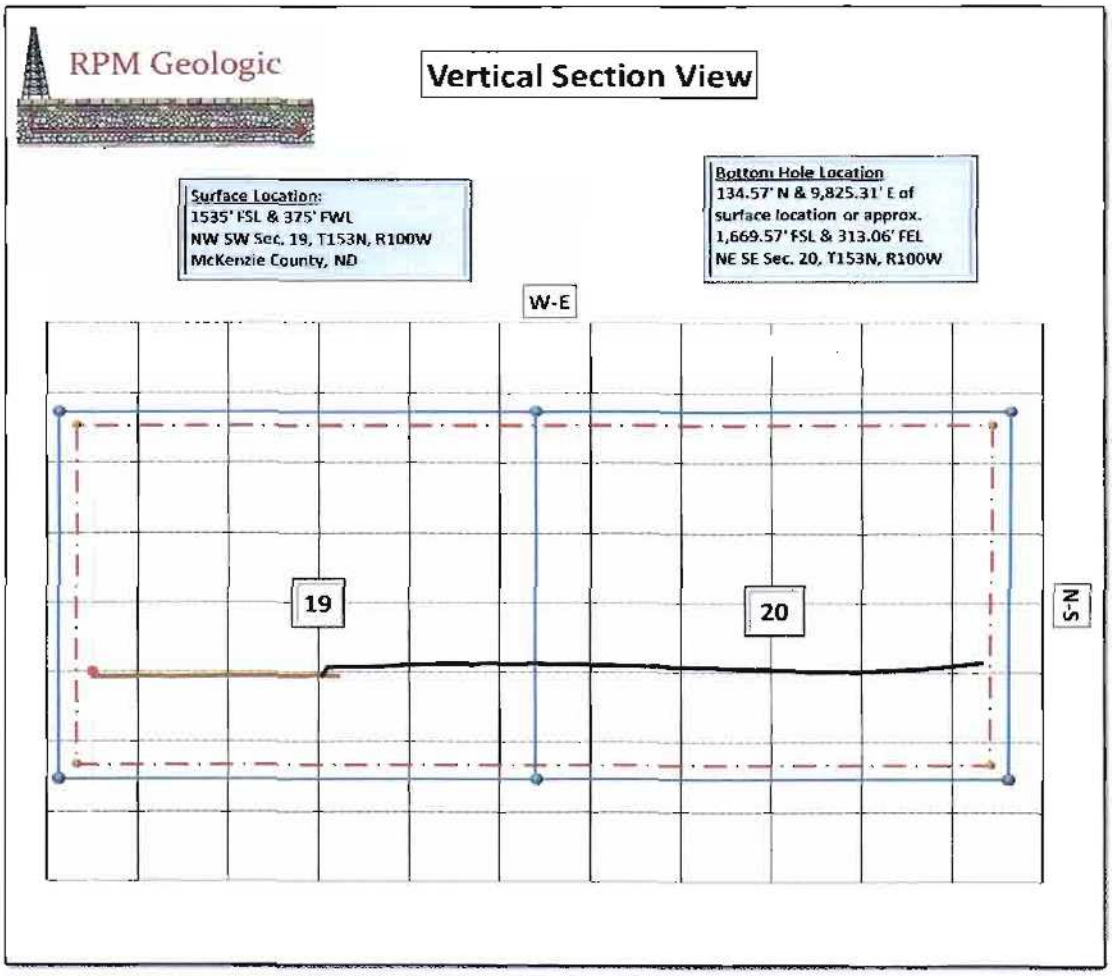
Verbal to Purchase and Transport Oil issued on condition that date of first production, date of first sales, and amount of first sales are reported to commision, also that sales do not exceed the barrels approved prior to submission of the Form 8. 43-02-03-81. AUTHORIZATION TO TRANSPORT OIL FROM A WELL OR CENTRAL PRODUCTION FACILITY. Before any crude oil is transported from a well or central production facility, the operator of the well or central production facility shall file with the director, and obtain the director's approval, an authorization to purchase and transport oil from a well or central production facility (form 8). All forms, reports, logs, and other information

Start Date	**12/1/2011**
Date Approved	**12/1/2011**
Approved By	**Jessica Gilkey**

20407
TH

Oasis Petroleum North America LLC

Chalmers 5300 31-19H



Services Performed For:
Mike Box, Bob Candito
Oasis Petroleum North America LLC
1001 Fannin Suite 202
Houston Texas 77002

Onsite Geology Performed by:
Tim Jahraus, Jamie Graham
RPM Geologic, LLC
geology@rpmconsultinginc.com
(303) 595-7625

05/14/2012

WELL EVALUATION

Oasis Petroleum North America LLC
Chalmers 5300 31-19H
NW SW Sec 19, T153N-R100W
McKenzie County, North Dakota

Synopsis

Oasis Petroleum North America LLC *Chalmers 5300 31-19H* [NW SW Section 19, T153N, R100W] is located ~5.7 miles South of the town of Williston, North Dakota. *Chalmers 5300 31-19H* is situated within a Wildcat Field in McKenzie County. A single lateral leg trending 90° was proposed to be drilled from the NW SW corner of Section 29 to the NE SW corner of Section 20 targeting the porous silty sandstone of the middle member of the **Bakken Formation**, approximately 10 - 20' below the top of the Upper Bakken Shale.

Control Wells

Two completed wells were used as control offsets on *Chalmers 5300 31-19H.*

The *Wade Federal 5300 21-30H* [SW NW Section 30, T153N, R100W] is a horizontal well drilled by Oasis Petroleum North America, LLC. It was spud 5 April 2011 and drilled to a total depth of 20,482' into the **Middle Bakken Formation**. *Wade Federal 5300 21-30H* is located approximately 0.7 miles South of *Chalmers 5300 31-19H.* It is still operated by Oasis Petroleum North America, LLC.

The *Kline Federal 5300 11-18H* [NW NW Section 18, T153N, R100W] is a horizontal well drilled by Oasis Petroleum North America, LLC. It was spud 7 May 2011 and drilled to a total depth of 20,650 into the **Middle Bakken Formation**. *Kline Federal 5300 11-18H* is located approximately 1.5 miles North of *Chalmers 5300 31-19H.* It is still operated by Oasis Petroleum North America, LLC.

During the curve, the gamma ray that was produced was constantly compared to the *Wade Federal 5300 21-30H* and *Kline Federal 5300 11-18H* wells. Gamma ray was used to help determine a proper landing depth.

To assist in the choosing of an initial target, an isopach table (Table 1) was constructed to measure the distance of formation tops to the target depth determined from the offset well. Comparison of gamma ray markers showed the most consistent isopach for up hole formations to be the **Base of Charles Salt**.

Control Wells

Operator:	Oasis Petroleum North America LLC				Oasis Petroleum North America LLC			
Well Name:	*Wade Federal 5300 21-30H*				*Kline Federal 5300 11-18H*			
Location:	SW NW Sec. 30 T153N R100W McKenzie County, ND 0.7 miles South of Chalmers 5300 31-19H				NW NW Sec. 18 T153N R100W McKenzie County, ND 1.5 miles North of Chalmers 5300 31-19H			
Elevation:	KB:2038'				KB: 2079'			
Formation/Zone	**E-Log**	**MSL Datum**	**Thickness**	**Dist to target**	**E-Log**	**MSL Datum**	**Thickness**	**Dist to target**
Charles Salt	8485	-6,447	653	2,185	8516	-6,437	698	2,215
Base of Charles Salt	9138	-7,100	772	1,532	9214	-7,135	788	1,517
Lodgepole	9910	-7,872	405	760	10002	-7,923	385	729
Lodgepole Marker A	10315	-8,277	58	355	10387	-8,308	61	344
Lodgepole Marker B	10373	-8,335	52	297	10448	-8,369	39	283
Lodgepole Marker C	10425	-8,387	56	245	10487	-8,408	52	244
Lodgepole Marker D	10481	-8,443	53	189	10539	-8,460	60	192
Lodgepole Marker E	10534	-8,496	54	136	10599	-8,520	53	132
Lodgepole Marker F	10588	-8,550	49	82	10652	-8,573	45	79
False Bakken	10637	-8,599	11	33	10697	-8,618	10	34
Upper Bakken Shale	10648	-8,610	14	22	10707	-8,628	14	24
Middle Bakken	10662	-8,624	8	8	10721	-8,642	10	10
Target	10670	-8,632	-	-	10731	-8,652	-	-

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

Geologic Assessment

Methods

Geologic supervision of *Chalmers 5300 31-19H* was provided by two experienced RPM well site geologists. Gas and chromatograph levels were measured using iBall Instruments Bloodhound™ real time gas detector and chromatograph system. The Bloodhound gas detection system uses non-dispersive infrared and chemical sensor gas detection to evaluate gases liberated from the formation by the drill bit and carried to the surface by the drilling fluid.

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

Under the direction of RPM well site geologist, rig crews were instructed to catch lagged drill cutting samples at 30' intervals from 8,120' throughout the curve and lateral section.

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

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

Vertical Operations

Overview

The *Chalmers 5300 31-19H* was spud for surface drilling on 1 September 2011, however the Nabors 149 drilling rig didn't actually spud until 4 October 2011. Prior to commencement of RPM mud logging services, a 13 1/2" hole was drilled with fresh water to depth of 1,915' and isolated with 9 5/8" 36# J-55 casing cemented to surface.

RPM well site geologists began logging the vertical section at 8,120'.

One PDC bit was used to drill out of surface casing to vertical TD. Bit #2 (8 ¾" Smith MDSi 616) PDC was used to drill from 1,915' to 9,948' and averaged an ROP of 95.6 ft/hr in 84 hours of use

Diesel invert drilling fluid with a mud weight ranging from 9.7-10.3 ppg was used for the remainder of the vertical hole and in the curve builds sections. The vertical section was drilled to a kick off point (KOP) of 9,948', at which point vertical operations were ceased.

Lithology

The top of the **Kibby Lime** [Pennsylvanian] was logged at 8,225' (-6,296'). Samples from this interval (Figure 1) were described as:

> LIMESTONE: mudstone, off white, cream, light brown, firm to hard, microcrystalline, crystalline texture, common fossils fragment, good visible porosity

*Figure 1: Photograph of limestone indicative of that seen in the **Kibby Lime Formation.***

No significant gas shows or increased penetration rates were detected while drilling through the Kibbey Lime.

The top of the **Charles Salt** [Mississippian Madison Group] was logged at 8,376' (-6,447'), level to the *Wade Federal 5300 21-30H*. The **Base Last Salt** was drilled at 9,043' (-7,114'), 14' low to the *Wade Federal 5300 21-30H*. Samples from this interval (Figure 2) were described as:

> SALT: clear, milky, translucent, crystalline, hard, euhedral to sub hedral, crystalline texture
>
> SHALE: orange to red, light brown in part, trace light gray, firm to soft, sub blocky to sub platey, earthy texture, slight to moderately calcareous
>
> ANHYDRITE: white, soft, amorphous texture

*Figure 2: Photograph of Limestone, salt and anhydrite seen in sample from the **Charles Formation.***

The top of the **Mission Canyon Formation** of the Madison Group [Mississippian] was penetrated at 9,281' (-7,352') (Figure 3). Though porosity was not easily detected, visible dead oil staining was noted. Samples from this interval were described as:

> ARGILLACEOUS LIMESTONE: wackestone, light brown to tan, light to medium gray, mottled in part, firm to hard, microcrystalline texture, dolomitic in part, trace fossils fragment, possible fracture porosity, trace oil stain
>
> LIMESTONE: mudstone, light brown to tan, light to medium gray, mottled in part, firm to hard, microcrystalline texture, dolomitic in part, trace fossils fragment, possible fracture porosity, trace oil stain

*Figure 3: Photograph of limestone and Anhydrite from the **Mission Canyon Formation.***

The top of the **Lodgepole Formation** of the Madison Group (Mississippian) was logged at 9,839' (-7,910') (Figure 4). The samples collected from the Lodgepole Formation were described as:

> ARGILLACEOUS LIMESTONE: wackestone, light brown to tan, light to medium gray, trace cream to white, trace very dark gray, microcrystalline, blocky, firm to hard, crystalline texture, trace fossils fragments, trace algal matting, intergranular porosity, trace oil stain

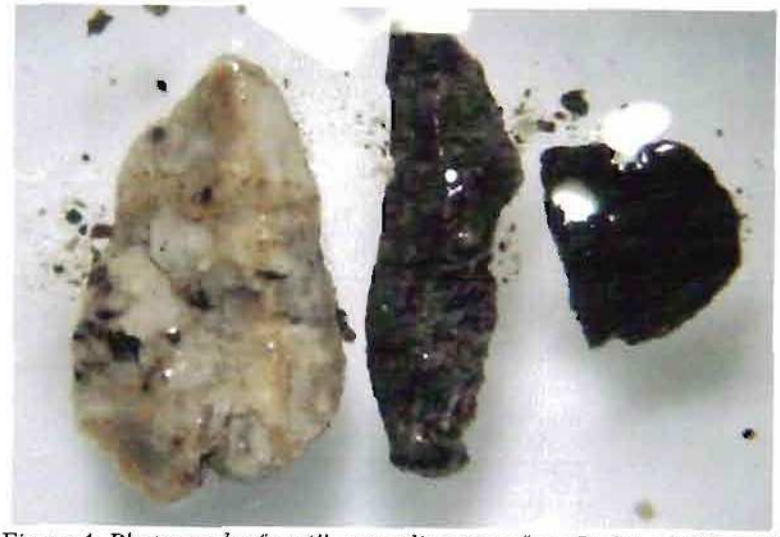


*Figure 4: Photograph of argillaceous limestone from **Lodgepole Formation.***

Directional Operations

RPM provided equipment and personnel for directional services. Ryan Energy Technologies (Ryan) provided equipment and personnel for MWD services. RPM geologists worked closely with RPM directional and Ryan MWD teams to formulate steering decisions to maximize the footage of borehole in the pay zone.

Curve Build

Overview

Bit #3 was an 8 ¾" Security DBS used in front of a 2.30° fixed mud motor to drill the curve from measured depth 9,948' to 10,906' in 33 hours, averaging 29 ft/hr.

A Chart was constructed for the curve (Chart 1) that compared the isopach of certain easily recognizable gamma markers From the **Base of Charles Salt** to **Middle Bakken Formation** on the two control wells. This chart was used to determine which gamma markers had the closest isopach thicknesses to the target and therefore the highest confidence in their use to land the curve. The curve was completed at a measured depth of 10,906'and TVD of ~ 10,593', ~ 10' below the Upper Bakken Shale.

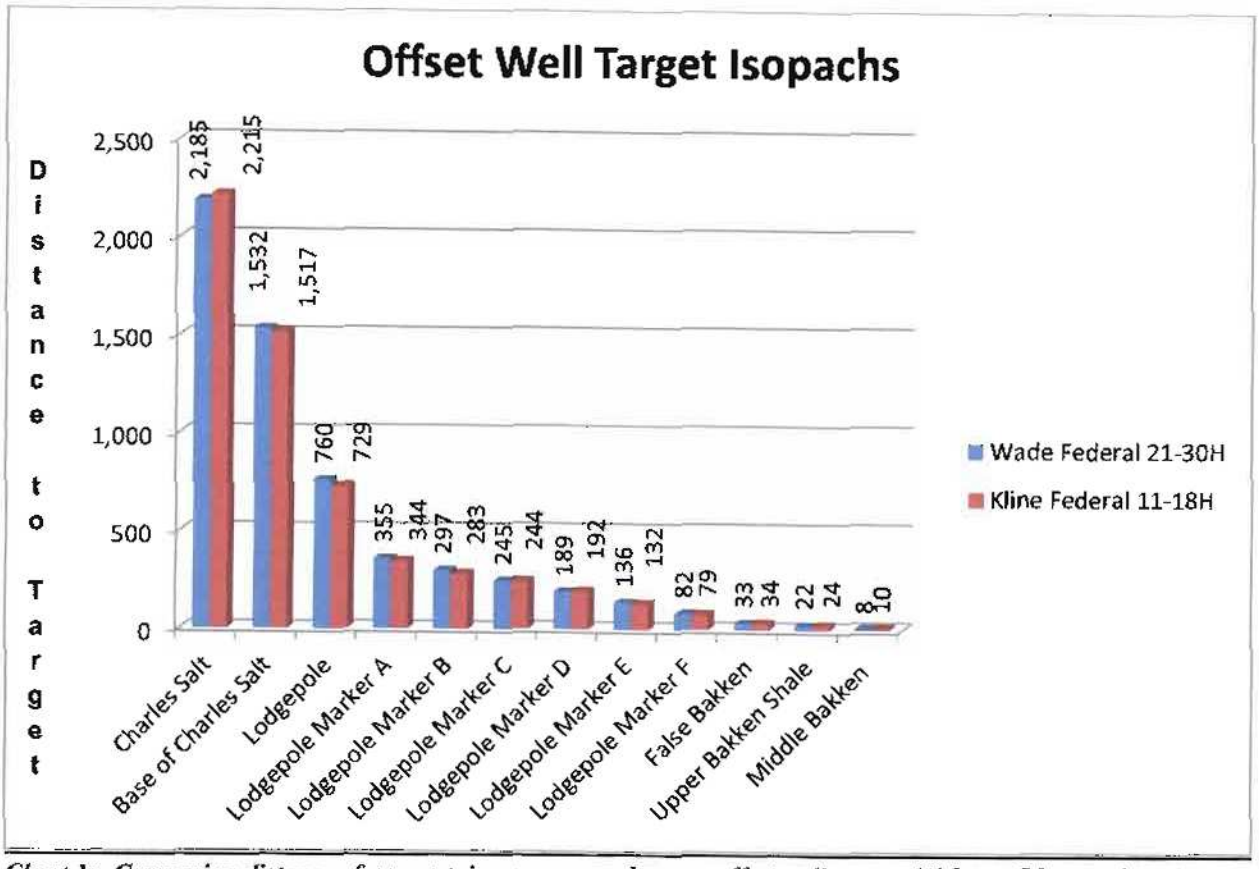


Chart 1: ***Comparing distances from certain gamma markers on offset wells to establish confidence of markers.***

Lithology

The top of the **"False Bakken"** was penetrated at a measured depth of 10,696' (TVD 10,550') (-8,621') suggesting a target depth of 10,590' TVD.

The *Upper Shale* of the **Bakken Formation** [Missippian – Devonian] was drilled at 10,736' (10,566' TVD) (-8,637') with sample returns of black, carbonaceous, and petroliferous shale (Figure 5) characterized by gamma ray values in excess of 255 API counts. Gas levels rose sharply through the *Upper Shale*, increasing from a background of ~400 units to over 1300 units, and then receded to ~830 units.
Samples were described as:

> SHALE: very dark gray to brown, sub blocky to blocky, friable to firm, smooth hard, waxy texture, calcareous, occasional disseminated pyrite, no visible oil stain

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

The Middle Member of the **Bakken Formation** was penetrated at 11,806' MD, (10,853' TVD) (-8,654'), 30' low to the *Wade Federal 5300 21-30H* well. The upper zone of the middle member contained a light grey siltstone with little or no oil stain or visible porosity (Figure 6). Samples from the top of the Middle member were described as:

> SILTSTONE: gray to brown, very fine grained, firm to friable, sub rounded to sub angular, vitreous, slight to not calcareous, well sorted, poorly cemented, trace disseminated pyrite, trace patchy oil stain, trace intergranular porosity

*Figure 6: Photograph of siltstone from top of middle member of the **Bakken Formation.***

Lateral

Overview

Drilling fluid consisting of open system salt water brine (9.9 to 10.3 ppg) was substituted for diesel invert while drilling the lateral section. One 6" PDC bit was used to drill the lateral.

Bit #4 (6" Smith MDi 613), was a PDC bit used to drill the entire lateral from 10,906' to 20,300'. The total of 9,394' was drilled in 120.5 hours for an average rate of penetration of 78.0 ft/hr.

At 0400 hours on 15 October 11, the Upper Bakken Shale was penetrated during horizontal drilling operations at a bottom hole location of 62.66' S and 2,803.34' E of surface location, approximately 1,472.34' FSL and 3,178.34' FWL NE SW Sec. 19, T153N, R100W, and forced the decision to sidetrack at 13,000'.

After a successful sidetrack, drilling operations were concluded at 0300 hours on 20 October 11 at a bottom hole location of 134,57' N & 9,825.31' E of surface location or approximately 1,669.57' FSL & 313.06' FEL NE SE Sec. 20 T153N, R100W.

Lithology

To aid in communications while drilling the lateral, a type log was created using the gamma signature from the *Verlin Fossum 26-1* well in Sec. 26, T153N, R101W (Diagram 1). The target zone was an area between the red lines on chart 1. The goal was to keep the well bore in this region for as much of the drilling operations as possible.

The Middle Member of the **Bakken Formation** consisted of 2 primary facies. The upper most was the light gray siltstone seen while landing the curve and described above. The second was silty sandstone that was characterized by a light to medium gray color, calcitic to dolomitic cementing and patchy oil staining (Figure 7). Samples from this vertical region of the middle member were generally described as:

> SILTY SANDSTONE: light to medium gray, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, fast abundant white streaming cut, strong cream to white diffuse cut

Figure 7: Photograph of silty sandstone from "Target Zone" on Diagram 1

Gas and hydrocarbon Shows

Total gas levels were recorded with an average background of ~ 100-400 units while drilling the **Lodgepole Formation** through most of the curve. Upon penetrating the Bakken Formation the total gas units immediately increased to over 1000 units, reaching a peak of 1,334 units. The amount of total gas began to gradually decrease to about 500 units by the casing point at 10,906' MD.

Upon exiting casing, total gas levels picked up to an average of 1500 units and gradually increased to an average of 3000 units by the end of the lateral.

As the bit moved through the target zone of the Middle Member of the **Bakken Formation** total gas levels gradually rose from 2800u to over 3300u until the bit began to drop near the bottom of the target zone, at which point gas levels dropped as low as 1010 units. The Bloodhound gas chromatograph showed components of all C1-C4 present through the entire lateral (Figure 8). A 3-5' flare was maintained at the flare stack intermittently through the lateral, whenever gas levels exceeded about 3000 units. Abundant oil began to wash out of the samples at about 11,800' and continued to wash out throughout the lateral, except where the well bore dropped below the target zone.

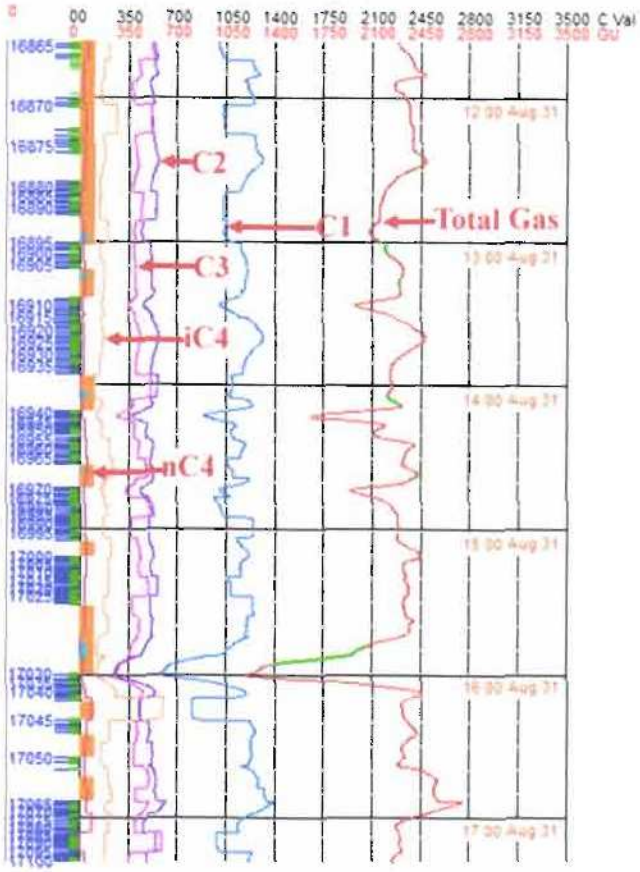


Figure 8: Screen shot of Bloodhound Chromatograph similar to that seen at the Chalmers 5300 31-19H well, showing C1-C4 present in formation gas.

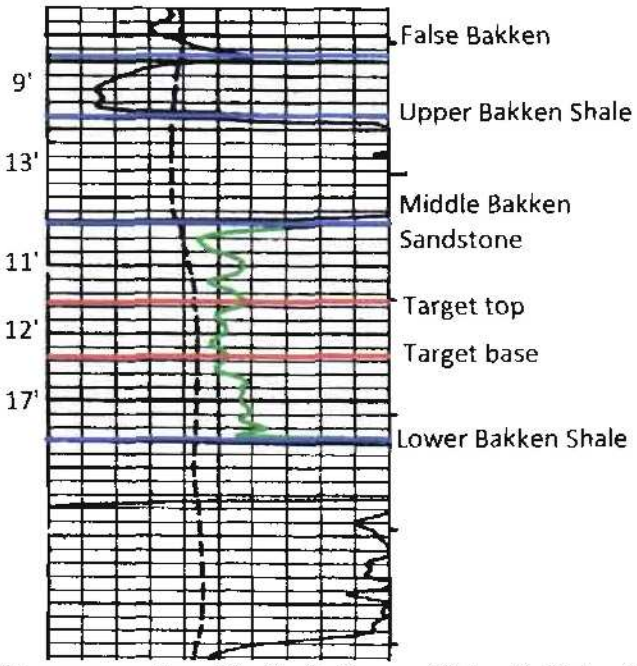


Diagram 1: Type log created from gamma log of the Verlin Fossum 26-1 well. Notice the target zone lies between 11' and 23' below upper shale.

Summary

1) The *Chalmer 5300 31-19H* was initially spud for surface drilling on 1 September 2011 in a Wildcat Field of McKenzie County, North Dakota. The well was spud by Nabors 149 on 4 October 2011. The vertical hole was drilled to a total depth (KOP) of 10,906'.

2) A mud program consisted of diesel invert (9.7 – 10.3 ppg) after surface casing and through the curve build sections. Brine water with a weight of 9.9 to 10.3 ppg was used during lateral drilling operations to maintain hydrostatic balance.

3) A 13 ½" bit was used to drill to a depth of 1,915'. Two 8 ¾" Smith PDC bits were used to drill out of surface casing to the KOP. Bit #1 drilled from a depth of 1,915' to 9,948', while Bit #2 drilled from 9,948' to 10,906'. The entire 10,352' lateral was drilled in 120.5 hours with one 6" Smith PDC bit.

4) Gas levels between 2800 and 3400 units were maintained through most of the lateral drilling operations.

5) The Middle Bakken consisted of two observed gross lithologies. Directly below the upper Bakken Shale a light gray siltstone was observed. Below this siltstone, silty sandstone ranging in colors from light to medium gray with occasional light tan to off white color to a medium to dark gray was well sorted and very fine grained. The target zone was comprised entirely of this silty sandstone.

6) A 3 to 5 foot flare was present intermittently at the stack through the lateral drilling operation.

7) Abundant oil began washing out of the sample from a measured depth of approximately 11,800' until TD at 20,300', except where the well bore dipped below the bottom of the target zone.

8) The Upper Bakken Shale was penetrated during horizontal drilling operations at a bottom hole location of 62.66' S and 2,803.34' E of surface location, approximately 1,472.34' FSL and 3,178.34' FWL NE SW Sec. 19, T153N, R100W, and forced the decision to sidetrack at 13,000'.

9) Drilling operations were concluded at 0300 hours on 20 October 11 at a bottom hole location of 134.57' N & 9,825.31' E of surface location or approximately 1,669.57' FSL & 313.06' FEL NE SE Sec. 20 T153N, R100W.

10) Oasis Petroleum *Chalmers 5300 31-19H* awaits completion operations to determine its ultimate production potential.

Respectfully submitted,
Tim Jahraus
RPM Geologic LLC

Well Information

Operator:	*Oasis Petroleum*	**API #:**	*33-053-03472-00-00*
Address:	*1001 Fannin Suite 202* *Houston, TX 77002*	**ND Well File #:**	*20407*
		Surface Location:	*NW SW Sec. 19, T153N - R100W*
Well Name:	***Chalmers 5300 31-19H***	**Footages:**	*1535' FSL & 375' FWL*
Field/ Prospect:	*Wildcat*	**County, State:**	*McKenzie County, North Dakota*
Elevation:	*GL: 1,904'* *KB: 1,929'*	**Basin:**	*Williston*
Spud Date:	*1-Sep-11 4-Oct-11*	**Well Type:**	*Bakken Formation*

Contractor:	*Nabors #149*	**Chemical Company**	*Dynamic Drilling Fluids*
Toolpushers:	*Dwight Knutson / Larry Erie*	**Mud Engineer**	*Ryan Buckley, Keith McCarty*
Field Supervisors:	*Mark Lawler,Eli Pucket*	**H_2S MONITORING:**	NA
Directional Drilling	*RPM* Mark Lawlar, Eli Pucket, Jordan Jensen	**MWD**	*Ryan Energy* Jace Pitre, Nick Brochu

Wellsite Geologist	*Tim Jahraus* *Jamie Graham* *Brandon Tillet*	**Rock Sampling:**	*30' from 8,120 to 10,700* *10' from 10,700 to 10,840* *30' from 10,840 to 13,267'*
Prospect Geologist	*Mike Box*	**Gas Detector**	*Bloodhound Gas Detection*
Sample Examination:	Binocular microscope & fluoroscope	**Sample Cuts:**	*EnTron-AE n-Propyl Bromide (nPB)*
Horizontal Target	*Middle Bakken Porosity*		

Key Offset Wells:

Oasis Petroleum North America LLC	***Wade Federal 5300 21-30H***	*SW NW Sec. 30 T153N R100W*	*McKenzie County, ND*
Oasis Petroleum North America LLC	***Kline Federal 5300 11-18H***	*NW NW Sec. 18 T153N R100W*	*McKenzie County, ND*

Pumps:	#1 & #2: National 10P-100 - 5.5" liners Output: 0.0699 bbl/stk		
Mud Type:	*Diesel invert mud 1,915' - 10,906'; Saltwater 10,906' - 20,300' (TD)*		
Casing:	*Surface: 9 5/8" 36# J-55 @ 1,915'* Intermediate: 7" 271 Jts 29# HCP-110; float collar & casing shoe set to 10,882'		
Hole Size:	*13 1/2" from conductor pipe at 75' to 1,915'*	*8 3/4" to 10,906'*	*6" to 20,300' (TD)*
Total Drilling Days:	*12 days*		

Horizontal Target:	Middle Bakken Porosity	**BOTTOM HOLE LOCATION:**
		62.66' S & 2803.34' E
Kick-Off Point / Date:	9,924' 9 October 2011	of surface location or approximately
		1,472.34' FSL & 3,178.34' FWL
Total Depth/ Date:	9,924' 9 October 2011	NE SW Sec. 19 T153N, R100W
Sidetrack	*20,300' at 03:00 on 20 Oct 11*	
Ending Vertical Section	2803.34	Sidetrack
Sidetrack	9,825.31	**BOTTOM HOLE LOCATION:**
		134.57' N & 9,825.31' E
Ending Azimuth	92.50°	of surface location or approximately
	81.70°	1,669.57' FSL & 313.06' FEL
		NE SE Sec. 20 T153N, R100W
Status of Well:	Awaiting completion of well	
Exposure to Formation:	99%	

Azimuths to True North
Magnetic North: 8.81°

Magnetic Field
Strength: 56793.9snT
Dip Angle: 73.15°
Date: 1/4/2011
Model: IGRF2010

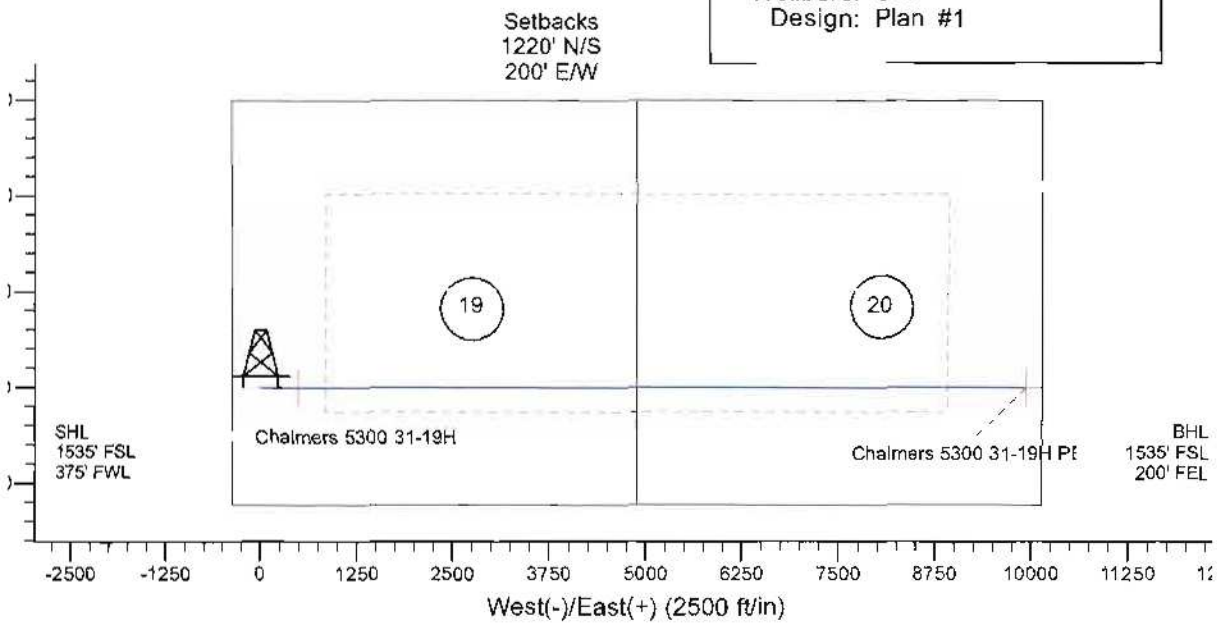
OASIS PETROLEUM

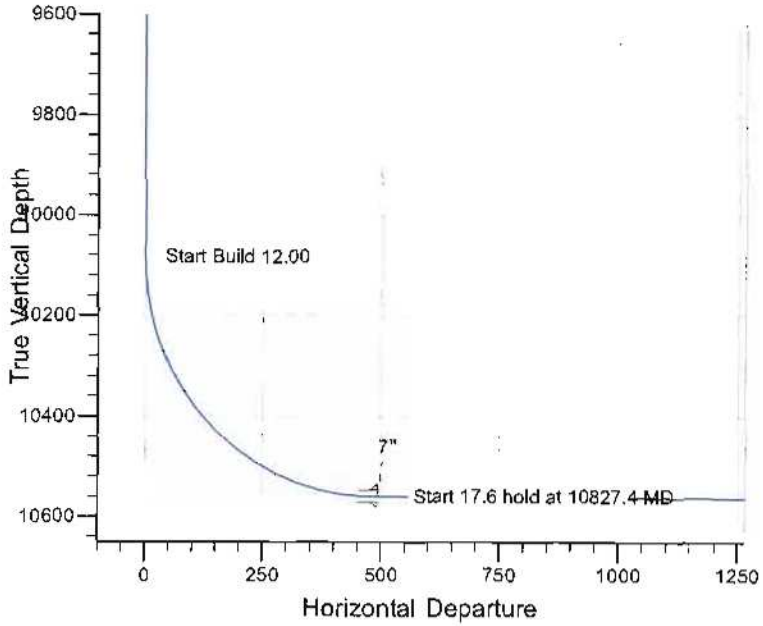
Project: McKenzie County, ND
Site: Sec. 19 T153N R100W
Well: Chalmers 5300 31-19H
Wellbore: OH
Design: Plan #1

SITE DETAILS: Sec. 19 T153N R100W

Site Centre Latitude: 48° 3' 26.470 N
Longitude: 103° 36' 9.410 W

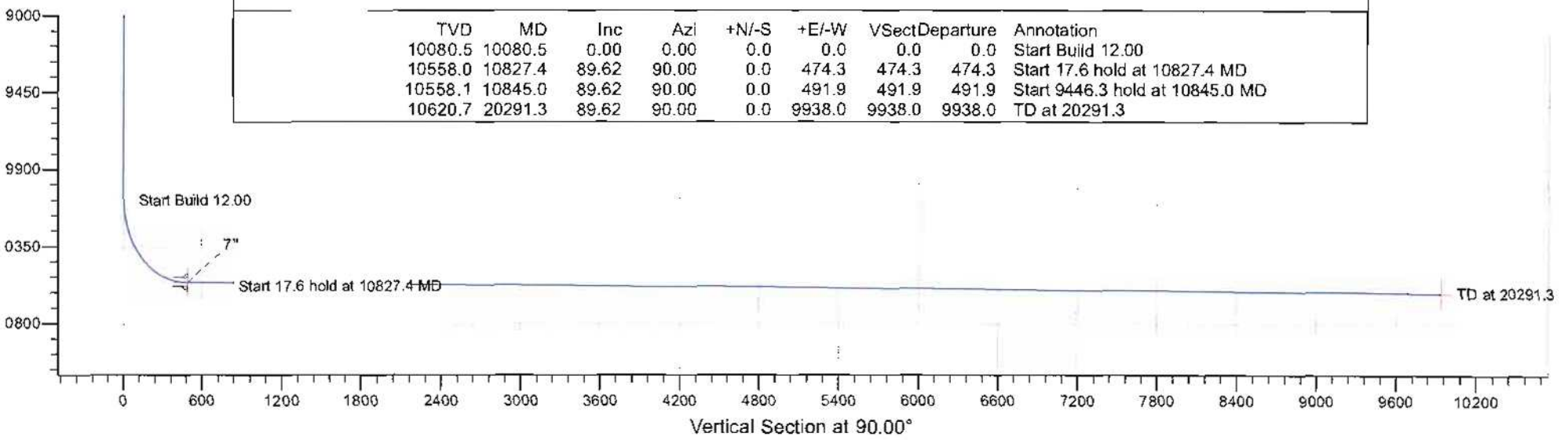
Positional Uncertainity: 0.0
Convergence: -2.31
Local North: True





ANNOTATIONS

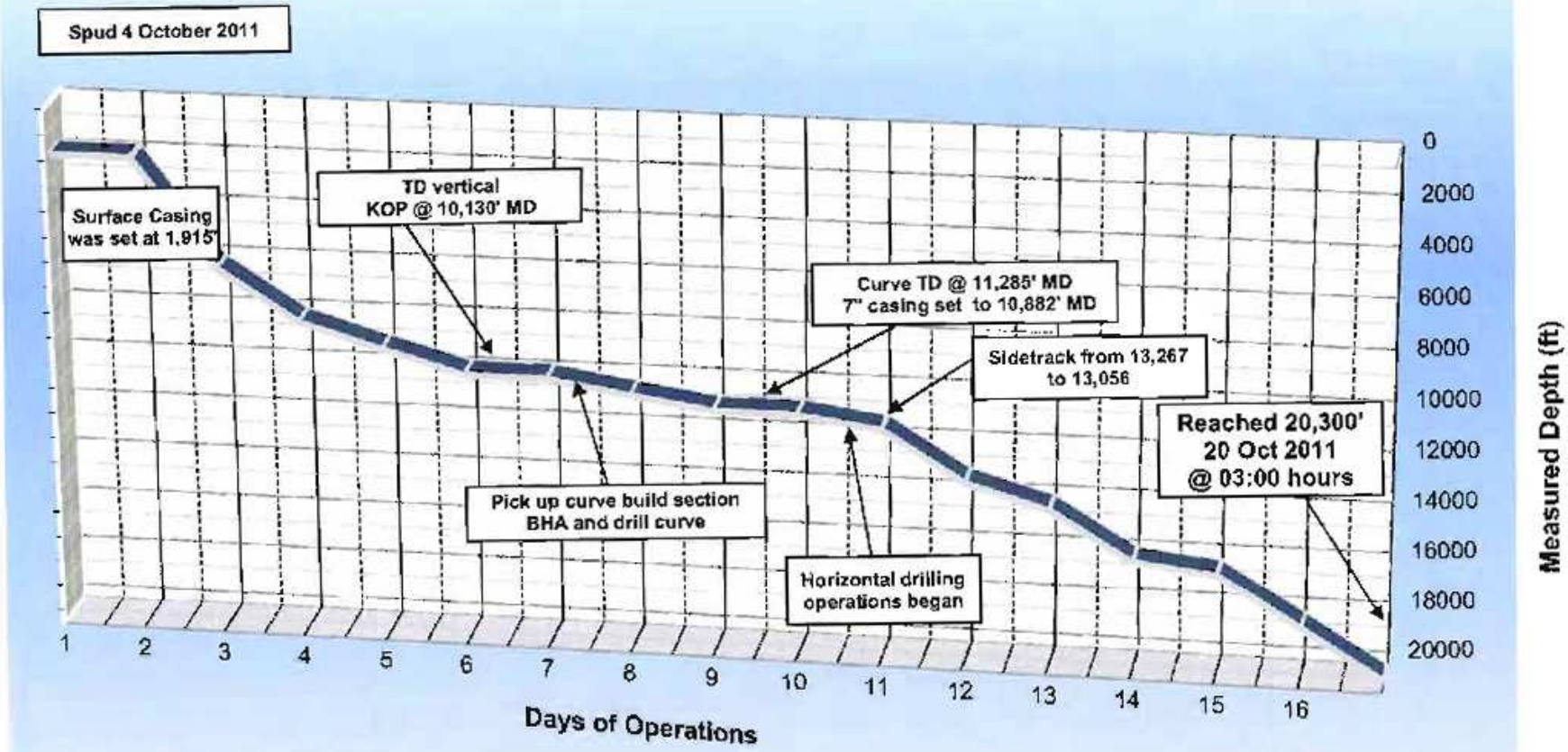
TVD	MD	Inc	Azi	+N/-S	+E/-W	VSect	Departure	Annotation
10080.5	10080.5	0.00	0.00	0.0	0.0	0.0	0.0	Start Build 12.00
10558.0	10827.4	89.62	90.00	0.0	474.3	474.3	474.3	Start 17.6 hold at 10827.4 MD
10558.1	10845.0	89.62	90.00	0.0	491.9	491.9	491.9	Start 9446.3 hold at 10845.0 MD
10620.7	20291.3	89.62	90.00	0.0	9938.0	9938.0	9938.0	TD at 20291.3



RPM Geologic

Daily Progress

Oasis Petroleum North America, LLC
Chalmers 5300 31-19H



Daily Activity

Day	Date 2011	Depth 0600 Hrs	24 Hr Footage	Bit #	WOB (Klbs) Rotate	WOB (Klbs) Slide	RPM (RT)	Pump Pressure	SPM 1	SPM 2	GPM	24 Hr Activity	Formation
1	4-Oct	1,915'	-	-	-	-	-	-	-	-	-	Test BOPs, install wear ring, test plug, rubber fell off the test, pulled wear ring and re-set wear ring, pick up directional tools, pick up drill pipe, rig repair, revamp suction tank lines for the mud pumps, tag cement and fill pipe, repair pump clutch, level the derrick.	-
2	5-Oct	1,915'	0	2	15	-	70	1800	95	-	-	Level derrick, drill out float EQ, drill from 1915' to 4229', surveys and connections, drill from 4,229' to 6,135', surveys and connections.	-
3	6-Oct	6,135'	4220	2	20	-	45	1800	75	75	-	Drill from 6135' to 7374', rig service, surveys and connections, drill from 7374 to 8138', surveys and connections.	Rierdon
4	7-Oct	8,138'	2003	2	25	-	45	1730	74	74	434	Drill from 8,138' to 8,615', service rig and top drive, circulate and condition, drill from 8,615' to 9,068'.	Charles Salts
5	8-Oct	9,068'	930	2	37	-	46	1900	74	74	434	Drill from 9068' to 9502' service rig and top drive, drill from 9502' to 9,948', circulate and condition.	Lodgepole
6	9-Oct	9,948'	880	2	-	-	-	-	-	-	-	Circulate and condition/pump dry job, TOOH, rig up wireliners, open hole logs, wireline/logging, open hole logs, pick up BHA, M/U bit adjust MMTR-scrive MWD tools, TIH, drill from 9,948 to 9,950'.	Lodgepole
7	10-Oct	9,950'	2	2	16	30	9	1900	76	76	446	Rotary and slide drilling from 9950' to 10250' service rig and top drive, slide drilling 10250' to 10295', circulate and condition, TOOH to 9773', re-log from 9733' to 10295', slide drilling from 10295' to 10453'.	Lodgepole

Daily Activity

Day	Date 2011	Depth 0600 Hrs	24 Hr Footage	Bit #	WOB (Klbs) Rotate	WOB (Klbs) Slide	RPM (RT)	Pump Pressure	SPM 1	SPM 2	GPM	24 Hr Activity	Formation
8	11-Oct	10,453'	503	3	27	38	9	1700	75	75	440	Drill from 10453' to 10726', service rig and top drive, Drill from 10726' to 10,906', circulate and condition hole, TOOH.	Middle Bakken
9	12-Oct	10,906'	453	-	-	-	-	-	-	-	-	Lay down drill pipe, lay down BHA, Install/remove wear vrushing, rig to pull/pull wear brushing, rig up/down to run casing, service rig and top drive, run casing.	Middle Bakken
10	13-Oct	10,906'	0	4	17	-	35	1750	87	0	252	Primary cementing, cementing 7" csg, rig down Haliburton cementers, lay dn, landing jt, pick up BHA, P/U 4" floor equip, make up BHA, pick up BHA, TIH, pick up 3rd party tools, PJSM W/ ACE rig up lay down truck to P/U 4" DP, pick up drill pipe, rig down lay down truck, cut drilling line 24 wraps, drilling cement, float @ 10,797' shoe @ 10,906', Drill from 10,906' to 11,338'.	Middle Bakken
11	14-Oct	11,338'	432	4	8	28	37	2000	82	0	240	Rotary and slide drilling from 11338' to 12041', service rig, Rotary and slide drilling from 12041' to 13,267'.	Middle Bakken
12	15-Oct	13,267'	1929	4	4	20	30	1400	84	0	246	Time drilling from 13056' to 13068', rotary/slide drilling from 13068' to 14,190'.	Middle Bakken
13	16-Oct	14,190'	923	4	2	67	44	2100	84	0	246	Drill from 14185' 16,090'.	Middle Bakken
14	17-Oct	16,090'	1900	4	5	30	42	2100	87	0	255	Drill from 16085' to 16340', service rig, pump dry job, TOOH 67 stands, quill up and pump 200 bbls of kill mud, TOOH, replace mud motor, TIH, drill from 16340' to 16433'.	Middle Bakken

Daily Activity

Day	Date 2011	Depth 0600 Hrs	24 Hr Footage	Bit #	WOB (Klbs) Rotate	WOB (Klbs) Slide	RPM (RT)	Pump Pressure	SPM 1	SPM 2	GPM	24 Hr Activity	Formation
15	18-Oct	16,433'	343	4	1	45	41	1750	0	84	246	Drill from 16435' to 17101', service rig, drill from 17101' to 18,375'.	Middle Bakken
16	19-Oct	18,375'	1942	4	12	70	42	2500	0	84	246	Drill from 18343' to 18629', service rig, adjust brakes, drill from 19233' to 20300', circulate and condition, pump dry job, TOOH	Middle Bakken
17	20-Oct	20,300'	1925	4	12	70	42	2500	0	84	246		Middle Bakken

Bit Record

Bit #	Size	Make	Model	Serial #	Jets	Depth In	Depth Out	Footage	Hours	Mean ROP (ft/hr)	Accum. Hours
1	13 1/2	Re-Tip	RT	T87325	4x18	75'	1,915'	1840	20	92.0	20.0
2	8 3/4	Smith	MDSI616	JE7147	6x14	1,915'	9,948'	8033	84	95.6	104.0
3	8 3/4	SEC	FXD55M	11690192	5x18	9,948'	10,906'	958	33	29.0	137.0

Daily Mud Data

Day	Date 2011	Depth (0600 Hrs)	Mud WT (ppg)	VIS (sec)	PV (cP)	YP (lbs/100 ft²)	Gels (lbs/100 ft²)	600/300	HTHP (cc/30min)	NAP/ H_2O (ratio)	Cake (API/ HT)	Solid % (%)	pH	Alk	Cl- (mg/l)	ES (v)	Loss (Bbls)
1	4-Oct	1,915'	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2	5-Oct	6,135'	10.1	52	11	6	4/5/6	-	6.9	82/18	-	15.00	-	-	51K	721	119
3	6-Oct	8,138'	9.8	50	6	7	3/4/5	3/2	6.8	84/16	-	12.20	-	-	50K	921	58
4	7-Oct	9,092'	9.7	52	10	8	4/5/5	28/18	6.6	83/17	-	12.10	-	-	55K	990	107
5	8-Oct	9,924'	9.7	51	10	8	3/4/4	28/18	6.0	82/18	-	12.30	-	-	49K	1012	0
6	9-Oct	9,948'	10.3	84	22	15	14/23	59/37	6.0	82/18	-	13.00	-	-	49K	954	48
7	10-Oct	9,950'	10.0	61	11	10	6/7/8	32/21	6.0	82/18	-	13.00	-	-	60K	951	23
8	11-Oct	10,453'	10.2	55	12	10	6/7/7	34/22	6.0	84/17	-	13.10	-	-	50K	974	0
9	12-Oct	10,906'	Switch from diesel invert to salt water drilling fluid at intermediate casing.														
10	13-Oct	10,906'															
11	14-Oct	11,338'	9.9	28	2	1	-	5/3	-	-	-	11.00	-	-	180	-	-
12	15-Oct	13,267'	10.0	28	2	1	-	5/3	-	-	-	11.00	-	-	189	-	-
13	16-Oct	14,190'	10.1	28	2	1	-	5/3	-	-	-	12.00	-	-	179	-	-
14	17-Oct	16,090'	10.2	29	2	1	-	5/3	-	-	-	14.00	-	-	169	-	-
15	18-Oct	16,433'	10.2	29	2	1	-	5/3	-	-	-	14.00	-	-	169	-	-
16	19-Oct	18,375'	10'	29.0	2	1	-	5/3	-	-	-	16	-	-	165	-	-
17	20-Oct	20,300'	10'	29.0	2	2	-	5/4	-	-	-	17	-	-	166	-	-

SERVICE COMPANIES, please distribute reports to all partners and government agencies as indicated

TRIBUTION LIST:

Chalmers 5300 31-19H

Operator: Oasis Petroleum

TIGHT HOLE YES X NO

"CONFIDENTIAL INFORMATION"

dy 26, 2011

NG CONTRACTOR:

Township 153 North, Range 100 West
Section 19/20
Indian Hills, McKenzie County
NORTH DAKOTA

/ADDRESSES	NOTIFICATION (Note Operations Requiring Partner Notification)	Drilling Order - Title Opinion	WELL PERMIT, SURVEY PLAT- EMAIL	SUNDRY NOTICES, STATE/ FEDERAL FORMS-Email	DAILY DRLG REPORT E-MAIL	DIRECTIONAL PLAN - SURVEYS & MWD	OPEN/CASED WIRELINE LOGS: PAPER PRINTS	OPEN/CASED WIRELINE LOGS: DIGITAL DATA	MUD LOG: DAILY	MUD LOG: FINAL	MUD LOG: DRY SAMPLE	DRILLING & COMPLETION PROCEDURE	DST/CORE/SIDEWALL ANALYSES	GEOLOGIC REPORT	PRODUCTION REPORTS, OIL WATER ANALYSIS	OTHER
Brigham Oil & Gas LP Primary Contact: Lance Langford 6300 Bridge Point Pkwy Building 2,Suite 500 Austin, TX 78730 fice:512-427-3300 Ext.3340/Cell:512-431-8992 Home:512-794-8992 reports@bexp3d.com Digital Logs Email: lasdata@bexp3d.com Fax for daily Mud logs: 512-427-3383	1		1	1	1		3	1	1	2		1	2	1	1	Notify of all spudding,logging,coring,formation tests, P&A or notice of sign. Oil or gas shows in suff. Time to have rep at wellsite
Brigham Oil & Gas LP Secondary Contact: Jeff Larson 6300 Bridge Point Pkwy Building 2,Suite 500 Austin, TX 78730 fice:512-427-3300EXt.3310/Cell:512-626-4536 Home:512-218-9560 reports@bexp3d.com	1															Notify of all spudding,logging,coring,formation tests, P&A or notice of sign. Oil or gas shows in suff. Time to have rep at wellsite
Diamond Exploration, Inc. Attn: Janet Skadeland 602 11th St. W. Williston, ND 58801-4937					1			1	1	1						
Hunt Oil and Gas 1900 N. Akard St. Dallas, TX 75201 ccenter@huntoil.com Angela Runnels 214-978-8600	1		1	1	1	2	1	2	1	2	1	2	2	1	1	
Northern Oil & Gas, Inc. Kruise Kemp Email: kkemp@northernoil.com	1				1			1	1	1		1			1	
Northern Oil & Gas, Inc. Michael Reger Email: mreger@northernoil.com	1				1			1	1	1		1			1	
OASIS PETROLEUM 1001 Fannin St. #1500 HOUSTON, TEXAS 77002 dailyreports@oasispetroleum.com	At Spud	1	1	1	1	1	2	1	1	1		1	1	1	1	
OASIS PETROLUEM Bob Candito-VP Geology 1001 Fannin ST.#1500 Houston,TX 77002 Direct: 281-404-9463/ Cell: 832-594-0141 bcandito@oasispetroleum.com	At Spud				1				1							
OASIS PETROLUEM Dean Gilbert 1001 Fannin ST.#1500 Houston, TX 77002 dgilbert@oasispetroleum.com					1				1							

SERVICE COMPANIES, please distribute reports to all partners and government agencies as indicated

TRIBUTION LIST: Chalmers 5300 31-19H

Operator: Oasis Petroleum

TIGHT HOLE YES X NO

"CONFIDENTIAL INFORMATION"

ly 26, 2011

IG CONTRACTOR:

Township 153 North, Range 100 West
Section 19/20
Indian Hills, McKenzie County
NORTH DAKOTA

/ADDRESSES	NOTIFICATION (Note Operations Requiring Partner Notification)	Drilling Order - Title Opinion	WELL PERMIT, SURVEY PLAT- EMAIL	SUNDRY NOTICES, STATE/ FEDERAL FORMS-Email	DAILY DRLG REPORT E-MAIL	DIRECTIONAL PLAN - SURVEYS & MWD	OPEN/CASED WIRELINE LOGS: PAPER PRINTS	OPEN/CASED WIRELINE LOGS: DIGITAL DATA	MUD LOG: DAILY	MUD LOG: FINAL	MUD LOG: DRY SAMPLE	DRILLING & COMPLETION PROCEDURE	DST/CORE/SIDEWALL ANALYSES	GEOLOGIC REPORT	PRODUCTION REPORTS, OIL, WATER ANALYSIS	OTHER
OASIS PETROLUEM Brian Gates 1001 Fannin ST.#1500 Houston, TX 77002 bgates@oasispetroleum.com					1				1							
OASIS PETROLUEM Mike Box 1001 Fannin ST.#1500 Houston, TX 77002 mbox@oasispetroleum.com					1				1							
OASIS PETROLUEM Andy Nelson 1001 Fannin ST.#1500 Houston, TX 77002 anelson@oasispetroleum.com					1				1							
OASIS PETROLUEM John Gillespie 1001 Fannin ST.#1500 Houston, TX 77002 jgillespie@oasispetroleum.com					1				1							
OASIS PETROLUEM Laura Strong 1001 Fannin ST.#1500 Houston, TX 77002 lstrong@oasispetroleum.com					1				1							
OASIS PETROLUEM Bill Knox 1001 Fannin ST.#1500 Houston, TX 77002 bknox@oasispetroleum.com					1				1							
ervice companies please distribute all reports **ners and government agencies as indicated:** **trial Commission of North Dakota** **d Gas Division** **ast Boulevard, Dept. 405** **rck, ND-58505-0840**						1	1	1		1	1		1	1		

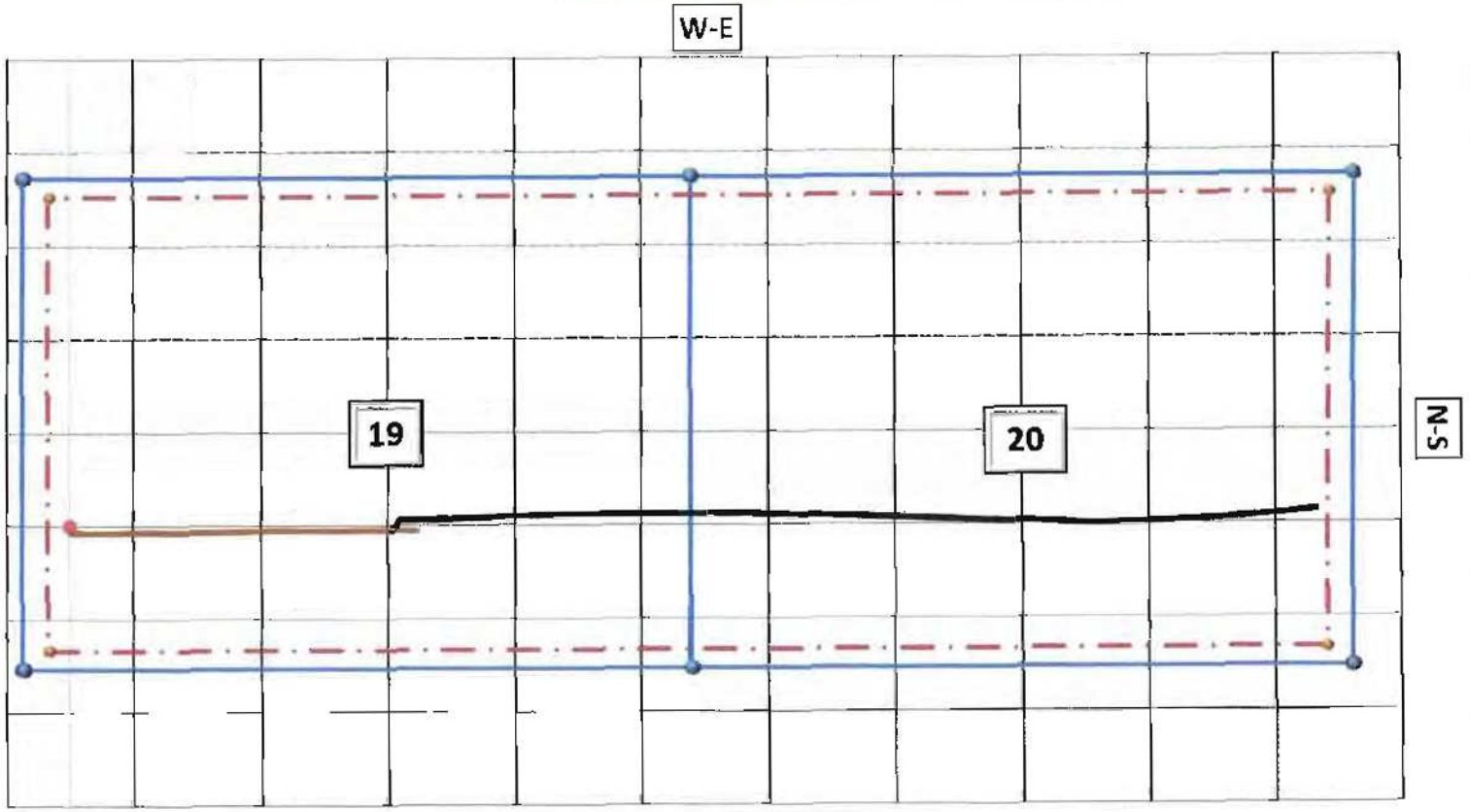
RPM Geologic

Vertical Section View

Surface Location:
1535' FSL & 375' FWL
NW SW Sec. 19, T153N, R100W
McKenzie County, ND

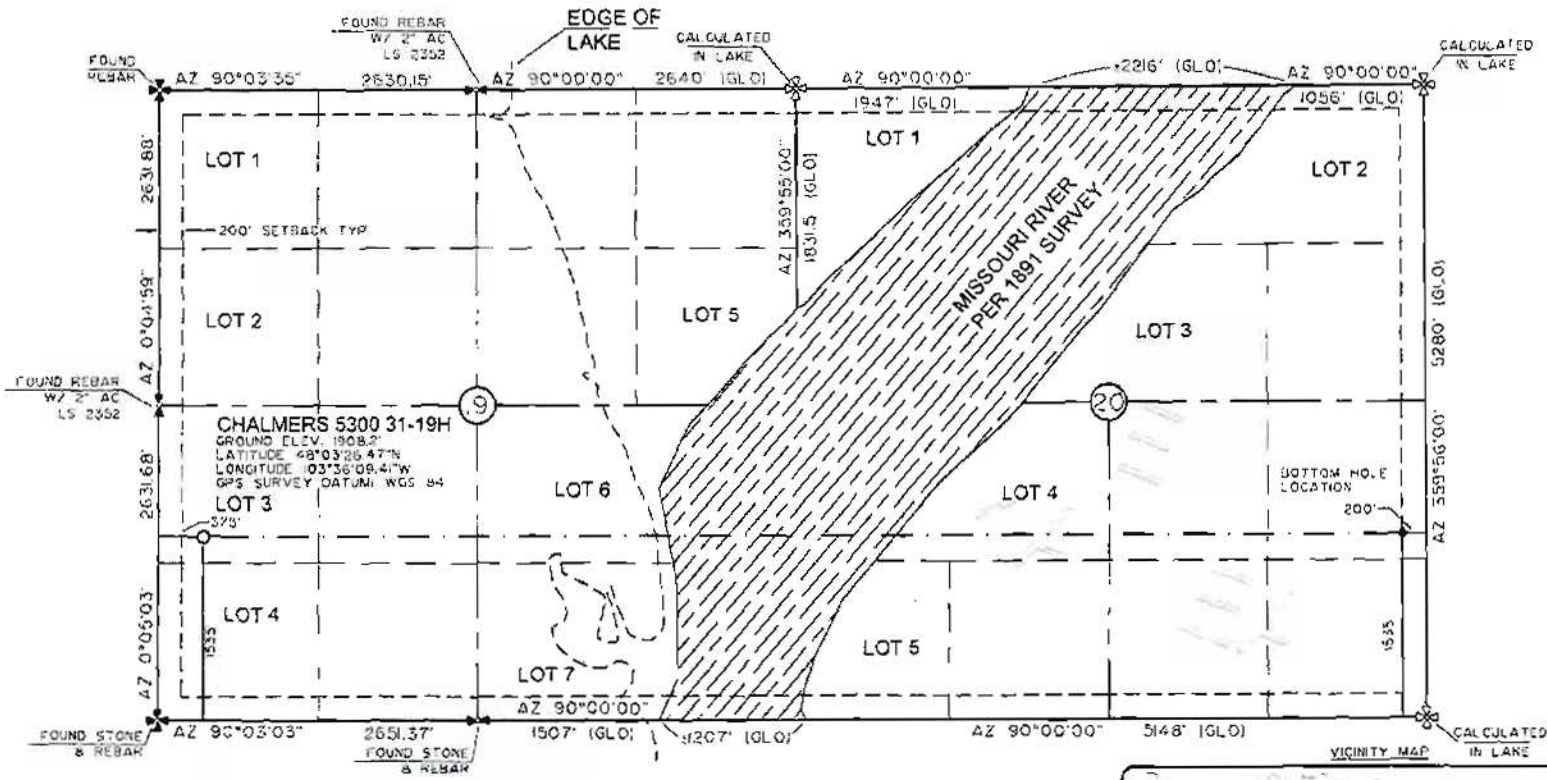
Bottom Hole Location
62.66' S & 2803.34' E
surface location or approx.
1,472.34' FSL & 3,178.34' FWL
NE SW Sec. 19 T153N, R100W

Sidetrack Bottom Hole Location
134.57' N & 9,825.31' E of surface location or approx.
1,669.57' FSL & 313.06' FEL
NE SE Sec. 20, T153N, R100W



WELL LOCATION PLAT

OASIS PETROLEUM NORTH AMERICA, LLC
1001 FANNIN, SUITE 202 HOUSTON, TX 77002
"CHALMERS 5300 31-19H"
1535 FEET FROM SOUTH LINE AND 375 FEET FROM WEST LINE
SECTION 19, T153N, R100W, 5th P.M., MCKENZIE COUNTY, NORTH DAKOTA



0 1000
1" = 1000'

● - MONUMENT - RECOVERED
⊗ - MONUMENT - NOT RECOVERED

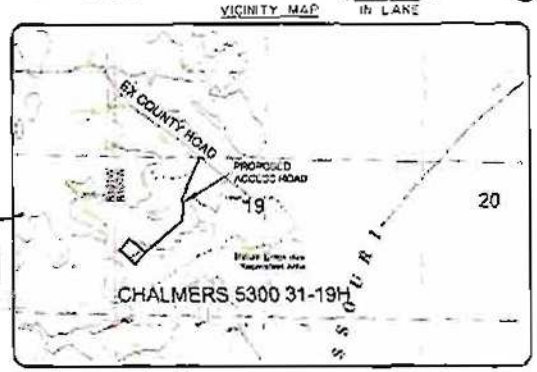
STAKED ON 9/23/10
VERTICAL CONTROL DATUM WAS BASED UPON CONTROL POINT 13 WITH AN ELEVATION OF 2090.6'

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

ROBERT L. PROVE 2884
INTERSTATE ENGINEERING INC.
P.O. BOX 648

REGISTERED LAND SURVEYOR
ROBERT L. PROVE
LS-2884
DATE 9/30/10
NORTH DAKOTA

VICINITY MAP



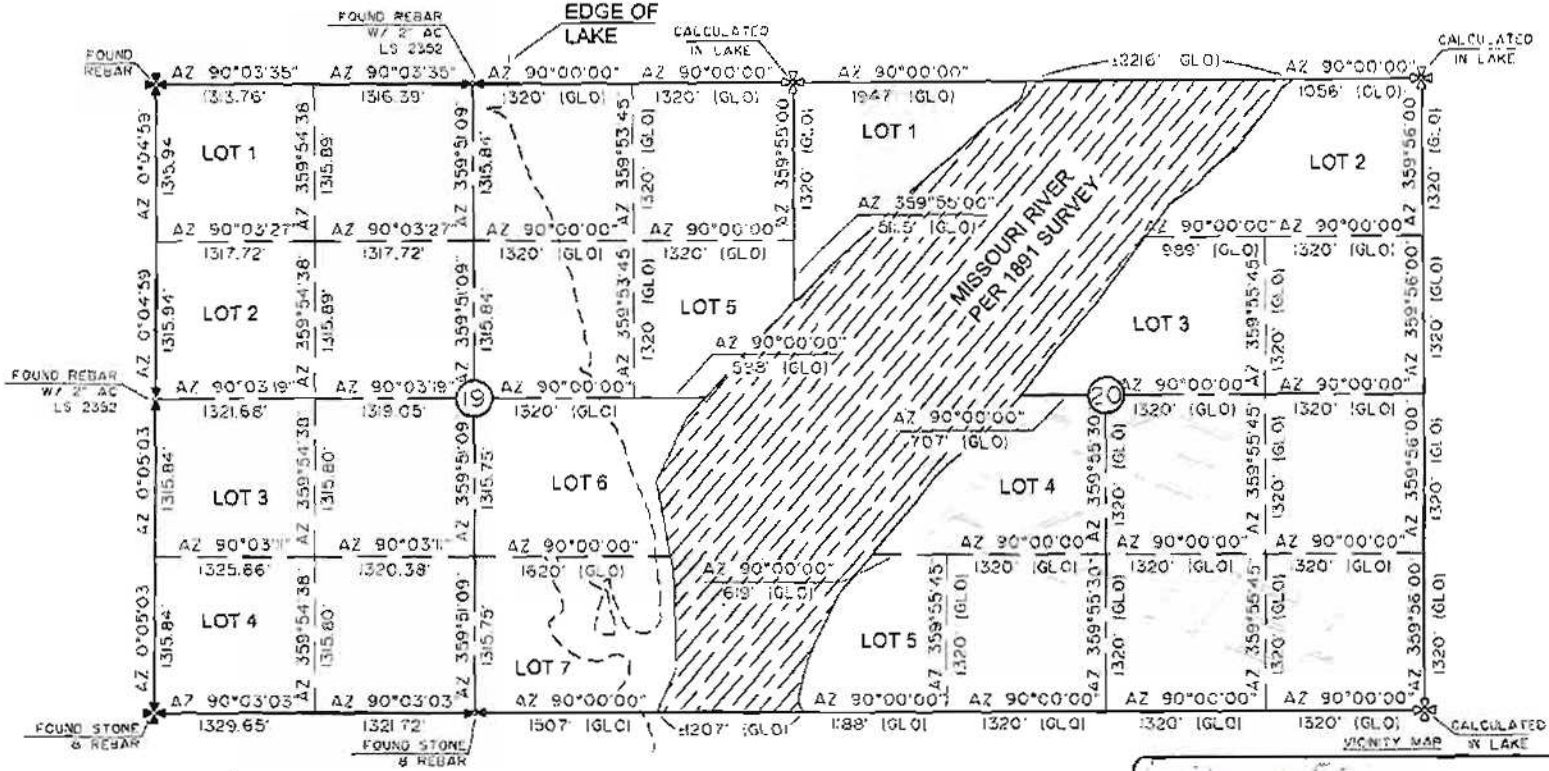
OASIS PETROLEUM NORTH AMERICA LLC
WELL LOCATION PLAT
SECTION 19, T153N, R100W
MCKENZIE COUNTY, NORTH DAKOTA

INTERSTATE ENGINEERING

1

SECTION BREAKDOWN

OASIS PETROLEUM NORTH AMERICA, LLC
1001 FANNIN, SUITE 202 HOUSTON, TX 77002
"CHALMERS 5300 31-19H"
1935 FEET FROM SOUTH LINE AND 375 FEET FROM WEST LINE
SECTION 19, T153N, R100W, 5th P.M., MCKENZIE COUNTY, NORTH DAKOTA



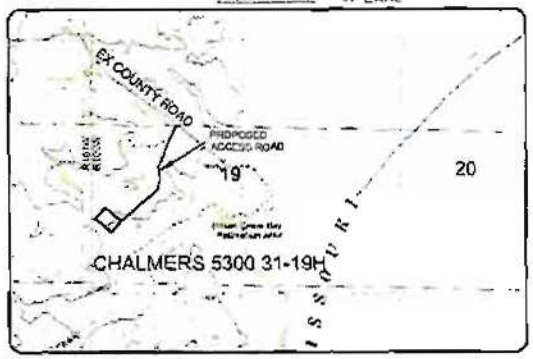
0 1000
1" = 1000'

ALL AZIMUTHS ARE BASED ON G.P.S. DERIVED BEARINGS. THE ORIGINAL SURVEY OF THIS AREA BY 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.

REGISTERED LAND SURVEYOR
ROBERT C. REUSCHE
LS-2884
DATE: 9/30/10
NORTH DAKOTA

MONUMENT - RECOVERED
MONUMENT - NOT RECOVERED

VICINITY MAP



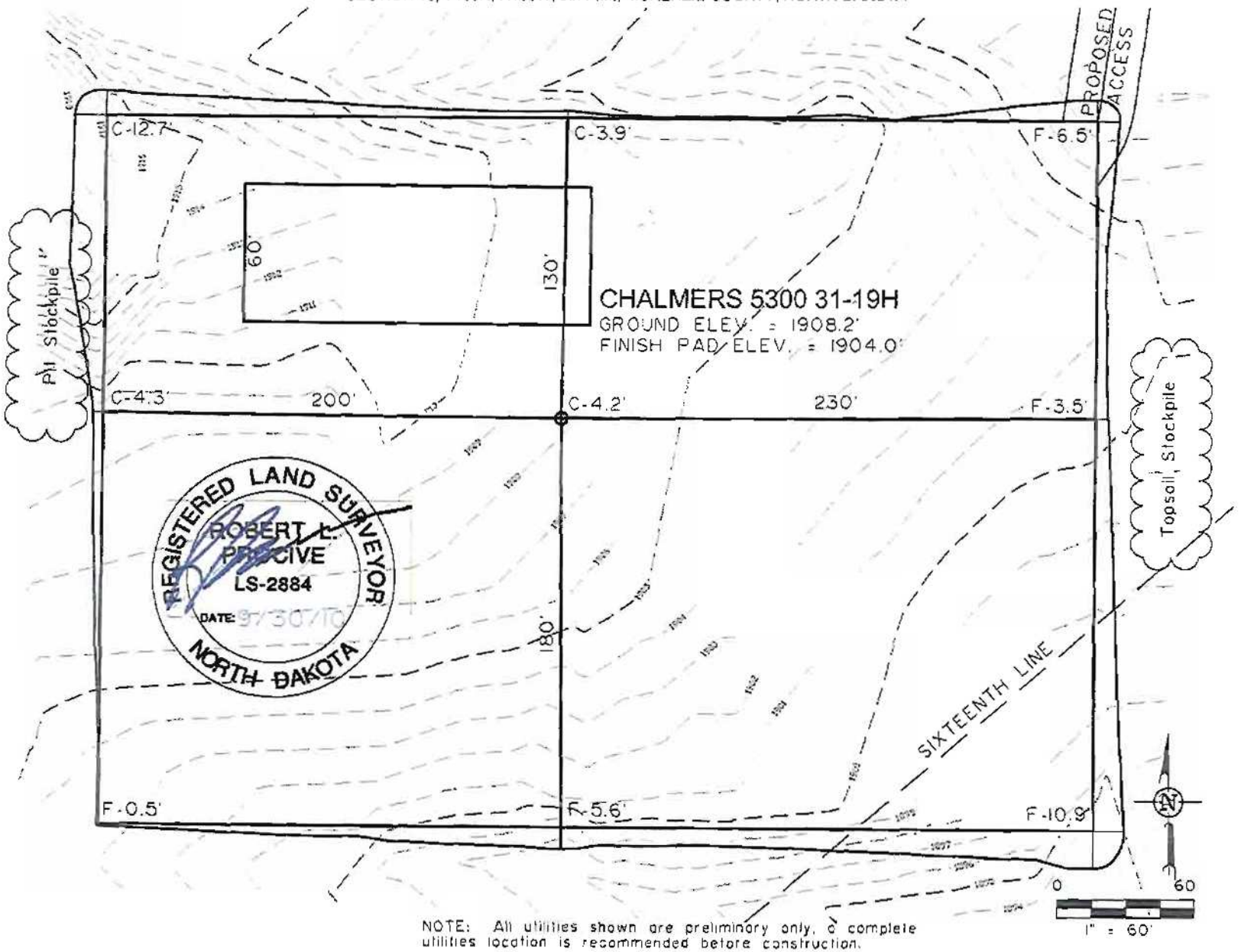
OASIS PETROLEUM NORTH AMERICA, LLC
SECTION BREAKDOWN
SECTIONS 19 & 20, T153N, R100W
MCKENZIE COUNTY, NORTH DAKOTA

INTERSTATE ENGINEERING

2

PAD LAYOUT

OASIS PETROLEUM NORTH AMERICA, LLC
1001 FANNIN, SUITE 202 HOUSTON, TX 77002
"CHALMERS 5300 31-19H"
1535 FEET FROM SOUTH LINE AND 375 FEET FROM WEST LINE
SECTION 19, T153N, R100W, 5th P.M., MCKENZIE COUNTY, NORTH DAKOTA



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

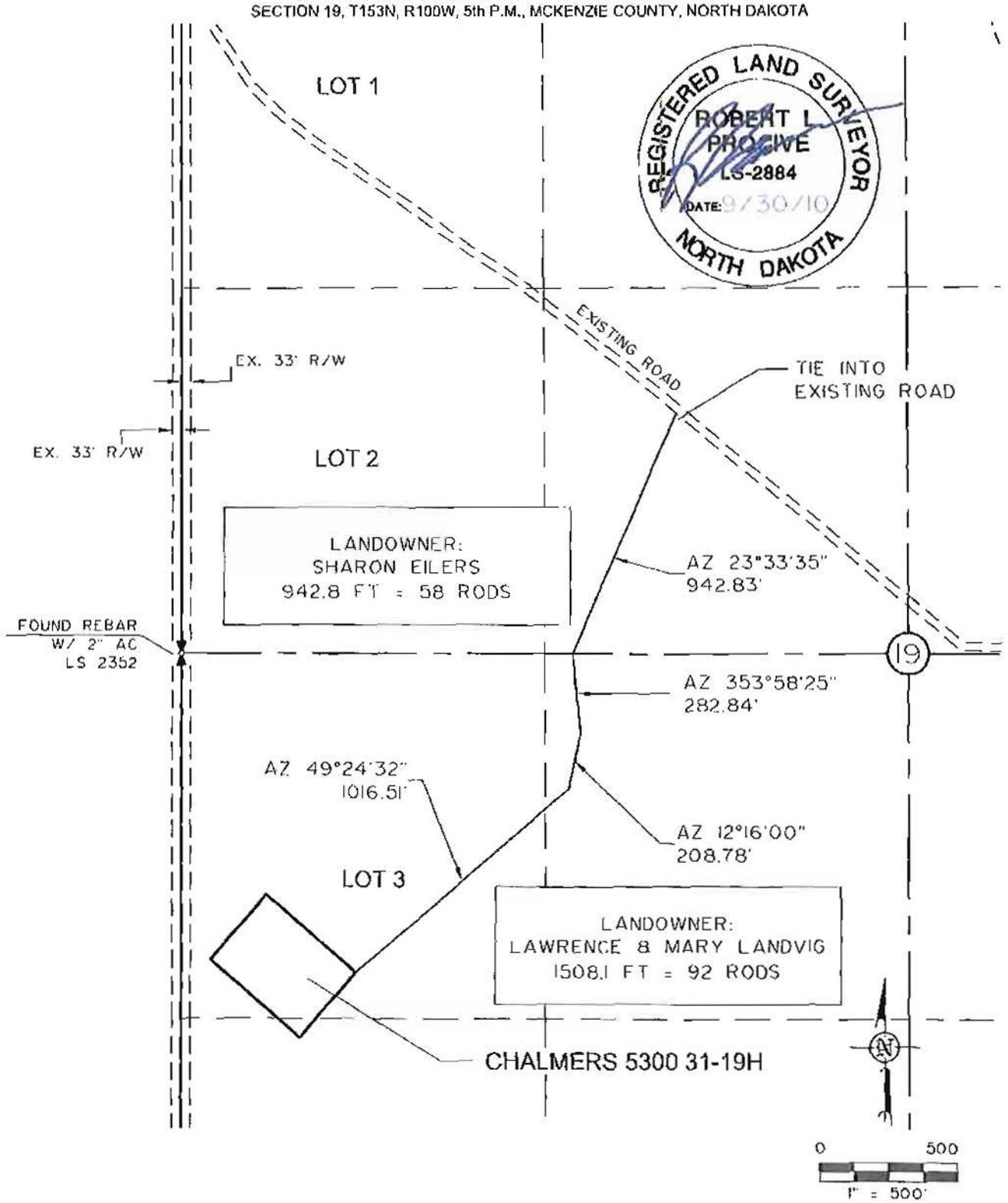
OASIS PETROLEUM NORTH AMERICA, LLC
PAD LAYOUT
SECTION 19, T153N, R100W
MCKENZIE COUNTY, NORTH DAKOTA

INTERSTATE ENGINEERING
Professionals you need, people you trust

3

ACCESS APPROACH

OASIS PETROLEUM NORTH AMERICA, LLC
1001 FANNIN, SUITE 202 HOUSTON, TX 77002
"CHALMERS 5300 31-19H"
1535 FEET FROM SOUTH LINE AND 375 FEET FROM WEST LINE
SECTION 19, T153N, R100W, 5th P.M., MCKENZIE COUNTY, NORTH DAKOTA



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

4
SHEET NO.

INTERSTATE ENGINEERING
Professionals you need, people you trust

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

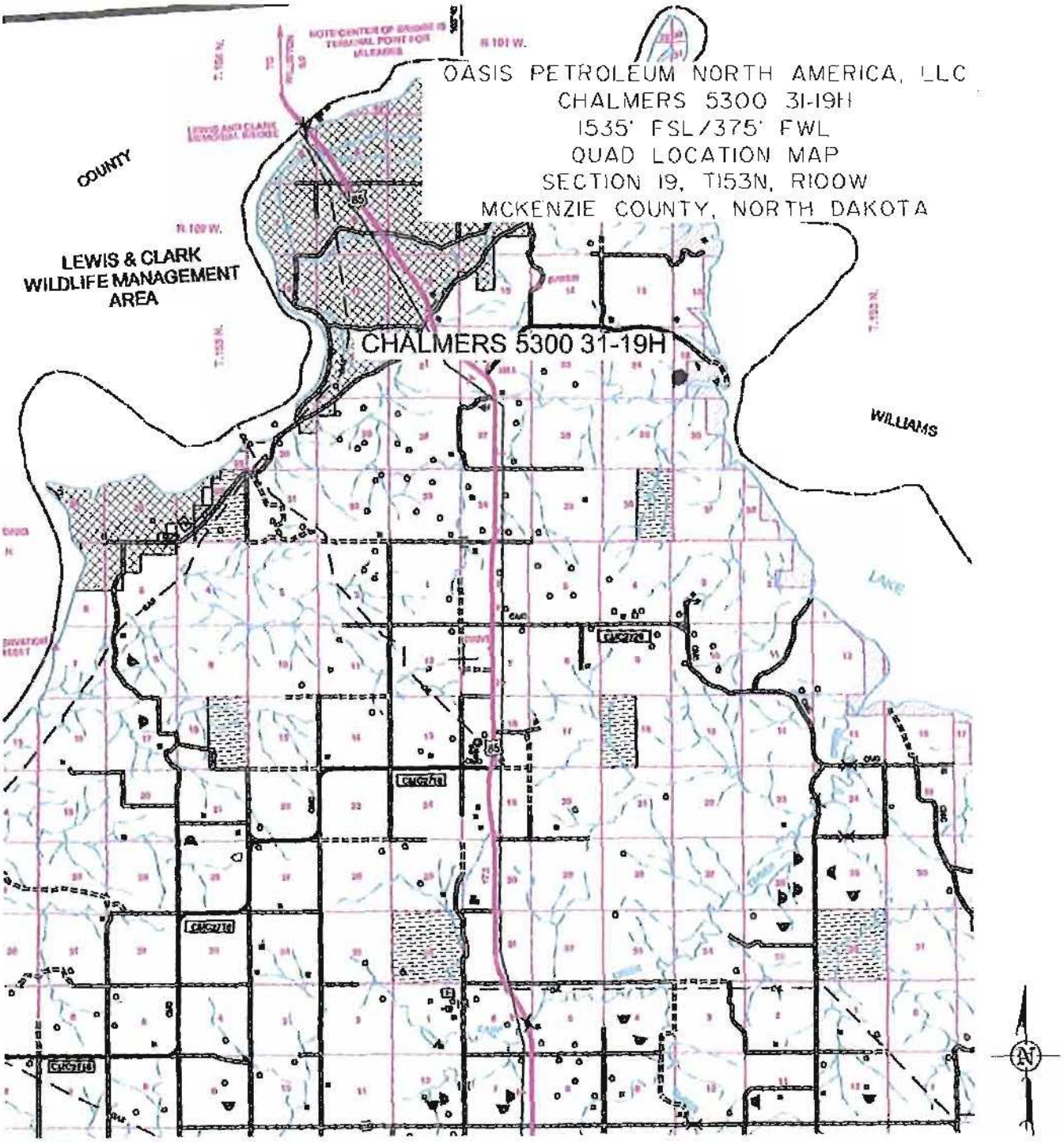
OASIS PETROLEUM NORTH AMERICA, LLC
ACCESS APPROACH
SECTION 19, T153N, R100W
MCKENZIE COUNTY, NORTH DAKOTA

Drawn By: J.S. | Project No.: 510C9-183
Checked By: A.J.H. R.L.P. | Date: SEPT. 2010

Revision No.	Date	By	Description

COUNTY ROAD MAP

OASIS PETROLEUM NORTH AMERICA, LLC
1001 FANNIN, SUITE 202 HOUSTON, TX 77002
"CHALMERS 5300 31-19H"
1535 FEET FROM SOUTH LINE AND 375 FEET FROM WEST LINE
SECTION 19, T153N, R100W, 5th P.M., MCKENZIE COUNTY, NORTH DAKOTA



SCALE: 1" = 2 MILE

6
SHEET NO

INTERSTATE ENGINEERING
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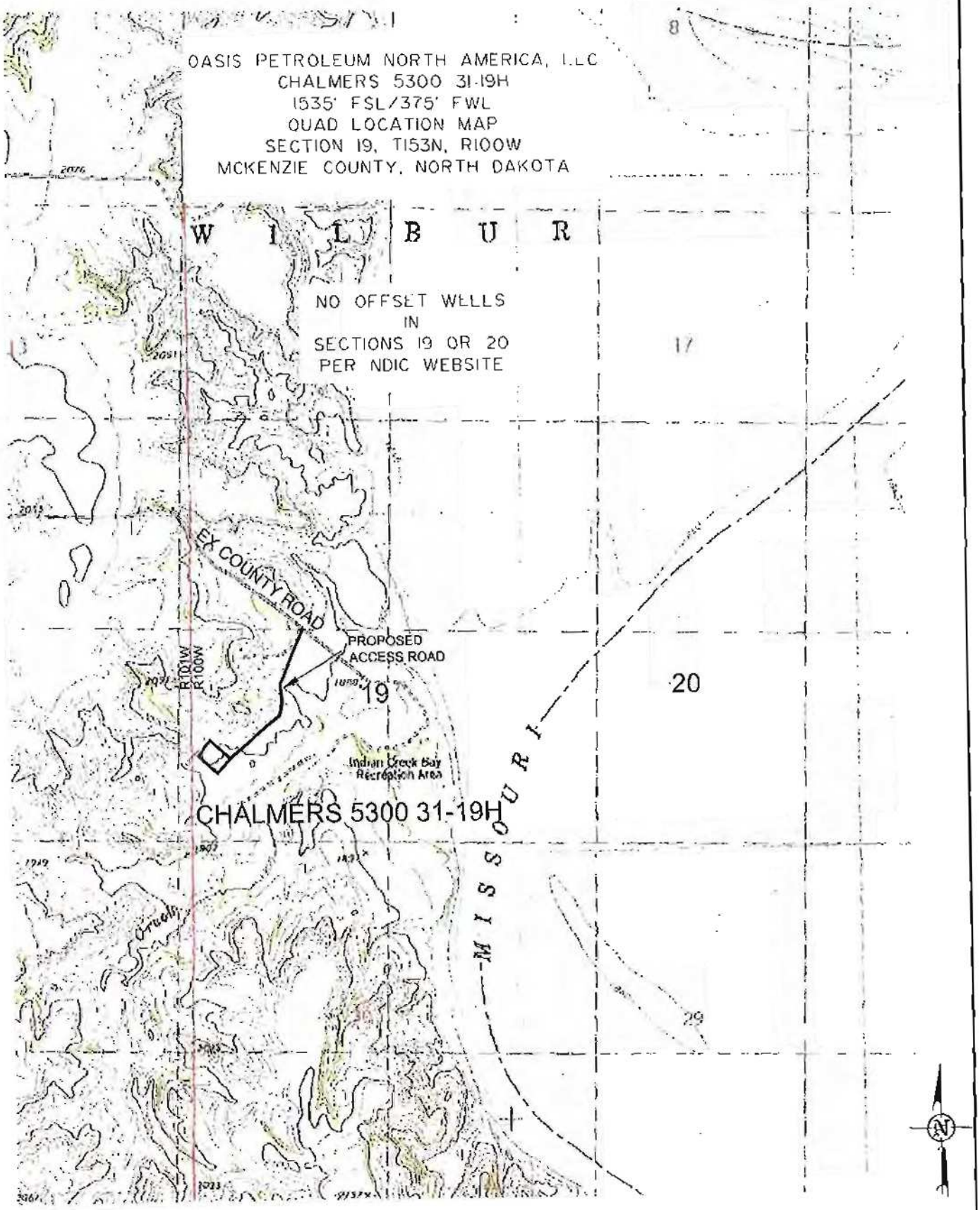
Interstate Engineering, Inc.
P.O. Box 648
425 East Main Street
Sidney, Montana 59270
Ph (406) 433-5617
Fax (406) 433-5618
www.interstateeng.com

OASIS PETROLEUM NORTH AMERICA, LLC
COUNTY ROAD MAP
SECTION 19, T153N, R100W
MCKENZIE COUNTY, NORTH DAKOTA

Drawn By: J.S.S. | Project No: 5300-16
Checked By: A.H.H.P. | Date: SEPT. 2010

Revision No.	Date	By	Description

OASIS PETROLEUM NORTH AMERICA, LLC
CHALMERS 5300 31-19H
1535' FSL/375' FWL
QUAD LOCATION MAP
SECTION 19, T153N, R100W
MCKENZIE COUNTY, NORTH DAKOTA



5

INTERSTATE ENGINEERING
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425 East Main Street
Sidney, Montana 59270
Ph (406) 433-5617
Fax (406) 433-5618
www.interstateeng.com

OASIS PETROLEUM NORTH AMERICA, LLC
QUAD LOCATION MAP
SECTION 19, T153N, R100W
MCKENZIE COUNTY, NORTH DAKOTA

Drawn By:	J.H.S.	Project No.:	510-09-161
Checked By:	A.W.S.P.	Date:	SEPT. 2010

No.	Date	By	Description

DRILLING PLAN

PROSPECT/FIELD	Indian Hills	Horizontal Middle Bakken	**COUNTY/STATE** McKenzie Co., ND
OPERATOR	Zavanna		**RIG** XTO 17
WELL NO.	5300 31-19H		**LEASE** Chalmers
LOCATION	NWSW 19-153N-100W	Surface Location (survey plat): 1535' fsl	375' fwl
EST. T.D.	20,291' MD		**GROUND ELEV:** 1904' Finished Pad Elev. **Sub Hieght:** 15
	TOTAL LATERAL:	9,446' (est)	**KB ELEV:** 1928'

PROGNOSIS: Based on 1,928' KB (est)

MARKER		DEPTH (Surf Loc)	DATUM (Surf Loc)
Pierre	NDIC MAP	1,780	140
Greenhorn		4,382	-2462
Mowry		4,795	-2875
Dakota		5,208	-3288
Rierdon		6,156	-4236
Dunham Salt		6,664	-4744
Dunham Salt Base		6,738	-4818
Spearfish		6,742	-4822
Pine Salt		7,058	-5138
Pine Salt Base		7,129	-5209
Opeche Salt		7,173	-5253
Opeche Salt Base		7,243	-5323
Broom Creek		7,383	-5463
Amsden (Top of Minnelusa Gp.)		7,436	-5516
Tyler		7,760	-5840
Otter (Base of Minnelusa Gp.)		7,836	-5916
Kibbey		8,189	-6269
Charles Salt		8,327	-6407
UB		8,932	-7012
Base Last Salt		9,034	-7114
Ratcliffe		9,074	-7154
Mission Canyon		9,254	-7334
Lodgepole		9,818	-7898
Lodgepole Fracture Zone		10,079	-8159
False Bakken		10,525	-8605
Upper Bakken		10,534	-8614
Middle Bakken		10,547	-8627
Middle Bakken Sand Target		10,558	-8638
Base Middle Bakken Sand Target		10,570	-8650
Lower Bakken		10,587	-8667
Three Forks		10,613	-8693

Dip Rate: -0.4° or .67ft /100ft down

Max. Anticipated BHP: 5015

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	
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 1000'

DST'S:

None planned

CORES:

None planned

MUDLOGGING:

Two-Man: 8,127'
~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'	1,880'	FW/Gel - Lime Sweeps				Circ Mud Tanks
Intermediate	1,880'	10,845'	Invert				Circ Mud Tanks
Liner	10,030'	20,291'	Salt Water				Circ Mud Tanks

CASING:	Size	Wt ppf	Hole	Depth	Cement	WOC	Remarks
Surface:	9-5/8"	36#	13-1/2"	1,880'	To Surface	12	100' into Pierre
Intermediate:	7"	29/32#	8-3/4"	10,845'	4781	24	500' above Dakota
Production Liner:	4.5"	11.6#	6"	20,291'	TOL @ 10,030'		50' above KOP

PROBABLE PLUGS, IF REQ'D:

OTHER:	MD	TVD	FNL/FSL	FEL/FWL	S-T-R	AZI
Surface:	1,880'	1880	1535' FSL	375' FWL	19-T153N-R100W	N/A
KOP:	10,081'	10,081'	1535' FSL	375' FWL	19-T153N-R100W	N/A
EOC:	10,827'	10,558'	1535' FSL	849' FWL	19-T153N-R100W	90.0
Casing Point:	10,845'	10,558'	1535' FSL	867' FWL	19-T153N-R100W	90.0
Middle Bakken Lateral TD:	20,291'	10,621'	1535' FSL	200' FEL	20-T153N-R100W	90.0

Survey Company:
Build Rate: 12 deg /100'

Comments:

DRILL TO KOP AND LOG.
DRILL CURVE TO 90 DEG AND 7" CASING POINT
SET 7" CASING. DRILL THREE FORKS LATERAL.
MWD Surveys will be taken every 100' in vertical hole, and a minimum of every 30' while building curve and every 90' while drilling latera
MWD GR to be run from KOP to Lateral TD.
GR must be run to ground surface.

Geology: ACNelson 10/14/2010 **Engineering:** L Strong BT-REV 2-2-2011

Formation Tops

Operator: / Well Name: / Location: / Elevation:	Subject Well: Oasis Petroleum *Lewis Federal 5300 31-31H* 1435' FNL 300' FWL NW SW 31-153N-100W GL: 2,161 Sub: 25' KB: 2,186'						
Formation/ Zone	Prog. Top	Prog. MSL Datum	Est. MD Top (ROP)	TVD Top (E-Log)	Est. MSL Datum	Thickness	Dip To *Wade Federal 21-30H*
Kibbey Lime	8,431	-6,..19'	8,431'	8,475'	-6,..63'	151'	7' Low
1st Charles Salt	8,578	6,266'	8,578'	8,626'	-6,314'	670'	8' High
Base Last Charles Salt	9,266	-6,954'	9,266'	9,296'	-6,984'	209'	11' Low
Mission Canyon	9,482	-7,170'	9,482'	9,505'	-7,193'	561'	1' Low
Lodgepole	10,026	-7,714'	10,026'	10,066'	-7,754'	747'	61' High
False Bakken	10,765	-8,453'	10,813'	-	8,501'	31'	19' High
Bakken Shale	10,771	-8,459'	10,844'	-	-8,532'	30'	15' High
Middle Bakken	10,783	-8,471'	10,874'	-	-8,562'	48'	12' High
Target	10,798	-8,486'	10,922'	-	-8,610'	-	-

Control Wells

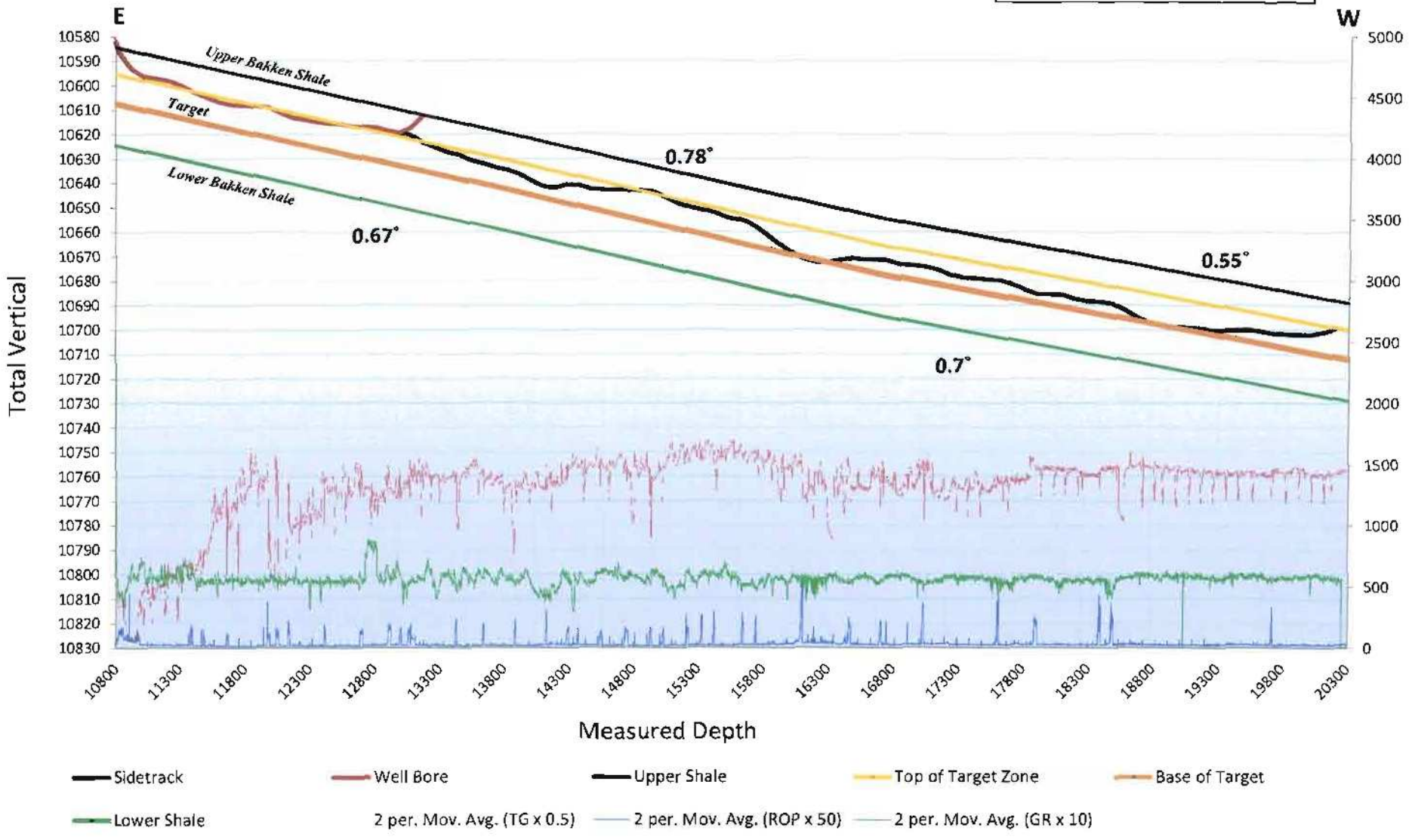
Operator: / Well Name: / Location: / Elevation:	Oasis Petroleum North America LLC *Wade Federal 5300 21-30H* SW NW Sec. 30 T153N R100W McKenzie County, ND 0.7 miles South of Clarence 5300 31-19H KB: 2,038'				Oasis Petroleum North America LLC *Kline Federal 5300 11-18H* NW NW Sec. 18 T153N R100W McKenzie County, ND 1.5 miles North of Clarence 5300 31-19H KB: 2,079'			
Formation/ Zone	E-Log	MSL Datum	Thickness	Dist to target	E-Log	MSL Datum	Thickness	Dist to target
Charles Salt	8485	-6,447	653	2,185	8516	-6,437	698	2,215
Base of Charles Salt	9138	-7,100	772	1,532	9214	-7,135	788	1,517
Lodgepole	9910	-7,872	405	760	10002	-7,923	385	729
Lodgepole Marker A	10315	-8,277	58	355	10387	-8,308	61	344
Lodgepole Marker B	10373	-8,335	52	297	10448	-8,369	39	283
Lodgepole Marker C	10425	-8,387	56	245	10487	-8,408	52	244
Lodgepole Marker D	10481	-8,443	53	189	10539	-8,460	60	192
Lodgepole Marker E	10534	-8,496	54	136	10599	-8,520	53	132
Lodgepole Marker F	10588	-8,550	49	82	10652	-8,573	45	79
False Bakken	10637	-8,599	11	33	10697	-8,618	10	34
Upper Bakken Shale	10648	-8,610	14	22	10707	-8,628	14	24
Middle Bakken	10662	-8,624	8	8	10721	-8,642	10	10
Target	10670	-8,632	-		10731	-8,652	-	-

RPM Geologic

Surface: 1535' FSL & 375' FWL
NW SW Sec. 19, T153N, R100W
Mckenzie County, ND

Chalmers 5300 31-19H
Horizontal Cross Section

Bottom Hole Location-
134.57' N & 9825.31' E
of surface location or approx.
1,669.57' FSL & 313.06' FEL
Sec. 20, T153N, R100W



Ryan
The leader in UNDERGROUND INTELLIGENCE℠

Company: Oasis
Field: McKenzie, ND
Cty/Blk/Par:
Well Name: Chalmers 5300 31-19H
Rig: Nabors 149

Job Number: 5098
Magnetic Decl.: 8.81
Grid Corr.:
Total Survey Corr.:
Target Info:

Calculation Method
Proposed Azimuth
Depth Reference
Tie Into:

No.	Tool Type	Survey Depth (ft)	Incl (°)	Azimuth (°)	Course Lgth (ft)	TVD (ft)	VS (ft)	Coordinates N/S (ft)		E/W (ft)		Closure Dist (ft)	Ang (°)
0	Tie-In	1915	0.00	0.00	0	1915.00	0.00	0.00	0	0.00		0	0
1	MWD	1987	0.50	17.70	72	1987.00	0.10	0.30	N	0.10	E	0.31	17.70
2	MWD	2082	0.50	284.00	95	2082.00	-0.18	0.79	N	0.18	W	0.81	347.19
3	MWD	2177	0.60	296.50	95	2176.99	-1.03	1.12	N	1.03	W	1.52	317.37
4	MWD	2273	0.90	284.10	96	2272.98	-2.21	1.52	N	2.21	W	2.68	304.61
5	MWD	2368	0.90	277.00	95	2367.97	-3.67	1.80	N	3.67	W	4.09	296.07
6	MWD	2463	1.10	272.10	95	2462.96	-5.33	1.92	N	5.33	W	5.66	289.84
7	MWD	2559	1.40	269.10	96	2558.93	-7.42	1.94	N	7.42	W	7.67	284.63
8	MWD	2654	2.10	266.70	95	2653.89	-10.32	1.82	N	10.32	W	10.48	280.00
9	MWD	2749	0.90	258.20	95	2748.86	-12.78	1.57	N	12.78	W	12.88	276.98
10	MWD	2845	1.00	251.30	96	2844.84	-14.32	1.14	N	14.32	W	14.36	274.56
11	MWD	2941	1.00	244.70	96	2940.83	-15.87	0.52	N	15.87	W	15.88	271.86
12	MWD	3036	1.60	234.90	95	3035.80	-17.70	0.60	S	17.70	W	17.71	268.06
13	MWD	3131	1.20	236.40	95	3130.77	-19.62	1.91	S	19.62	W	19.71	264.43
14	MWD	3227	0.80	209.10	96	3226.76	-20.78	3.06	S	20.78	W	21.00	261.63
15	MWD	3322	0.70	247.40	95	3321.75	-21.64	3.86	S	21.64	W	21.98	259.89
16	MWD	3418	0.70	261.60	96	3417.75	-22.76	4.17	S	22.76	W	23.14	259.62
17	MWD	3513	1.00	273.60	95	3512.74	-24.16	4.20	S	24.16	W	24.52	260.13
18	MWD	3609	1.00	274.20	96	3608.72	-25.83	4.09	S	25.83	W	26.15	261.01
19	MWD	3704	1.00	256.90	95	3703.71	-27.47	4.21	S	27.47	W	27.79	261.28
20	MWD	3800	0.60	232.70	96	3799.70	-28.68	4.71	S	28.68	W	29.07	260.68
21	MWD	3895	0.60	228.40	95	3894.69	-29.45	5.34	S	29.45	W	29.93	259.72
22	MWD	3991	0.90	253.10	96	3990.68	-30.55	5.89	S	30.55	W	31.11	259.08
23	MWD	4086	0.70	226.10	95	4085.67	-31.68	6.51	S	31.68	W	32.34	258.38
24	MWD	4181	0.40	238.60	95	4180.67	-32.38	7.09	S	32.38	W	33.15	257.65
25	MWD	4277	0.40	238.40	96	4276.67	-32.95	7.44	S	32.95	W	33.78	257.28
26	MWD	4373	0.60	253.40	96	4372.66	-33.72	7.76	S	33.72	W	34.60	257.04
27	MWD	4468	0.90	236.00	95	4467.66	-34.81	8.32	S	34.81	W	35.79	256.56
28	MWD	4563	0.40	245.90	95	4562.65	-35.73	8.87	S	35.73	W	36.82	256.06
29	MWD	4659	0.90	251.00	96	4658.64	-36.75	9.25	S	36.75	W	37.90	255.87
30	MWD	4754	0.80	287.50	95	4753.63	-38.09	9.30	S	38.09	W	39.21	256.29
31	MWD	4850	0.80	263.30	96	4849.62	-39.40	9.17	S	39.40	W	40.45	256.89
32	MWD	4942	1.00	236.40	92	4941.61	-40.70	9.69	S	40.70	W	41.84	256.61
33	MWD	5038	1.20	215.20	96	5037.60	-41.98	10.98	S	41.98	W	43.39	255.35
34	MWD	5133	0.60	246.70	95	5132.58	-43.01	11.99	S	43.01	W	44.65	254.43
35	MWD	5228	1.00	215.40	95	5227.58	-43.95	12.86	S	43.95	W	45.79	253.69
36	MWD	5324	0.90	208.90	96	5323.56	-44.80	14.20	S	44.80	W	46.99	252.41
37	MWD	5419	1.10	207.60	95	5418.55	-45.58	15.66	S	45.58	W	48.20	251.04
38	MWD	5515	1.30	210.90	96	5514.53	-46.57	17.41	S	46.57	W	49.72	249.50
39	MWD	5610	1.20	185.10	95	5609.50	-47.21	19.33	S	47.21	W	51.01	247.73
40	MWD	5705	1.10	188.00	95	5704.49	-47.42	21.22	S	47.42	W	51.96	245.89
41	MWD	5801	1.50	202.00	96	5800.46	-48.02	23.30	S	48.02	W	53.38	244.12
42	MWD	5896	0.70	212.20	95	5895.44	-48.80	24.94	S	48.80	W	54.80	242.92
43	MWD	5992	0.40	166.40	96	5991.44	-49.03	25.77	S	49.03	W	55.39	242.28
44	MWD	6087	0.30	209.20	95	6086.44	-49.07	26.31	S	49.07	W	55.68	241.81
45	MWD	6182	0.10	82.20	95	6181.44	-49.11	26.51	S	49.11	W	55.81	241.64
46	MWD	6277	0.80	258.20	95	6276.43	-49.68	26.64	S	49.68	W	56.37	241.80
47	MWD	6372	0.80	200.90	95	6371.43	-50.57	27.39	S	50.57	W	57.51	241.56
48	MWD	6468	1.50	214.10	96	6467.41	-51.51	29.06	S	51.51	W	59.14	240.57
49	MWD	6563	1.30	218.60	95	6562.38	-52.88	30.93	S	52.88	W	61.26	239.68
50	MWD	6658	1.10	190.80	95	6657.36	-53.72	32.67	S	53.72	W	62.88	238.70

51	MWD	6754	1.30	190.90	96	6753.34	-54.10	34.64	S	54.10	W	64.24	237.37
52	MWD	6849	1.50	207.40	95	6848.31	-54.88	36.80	S	54.88	W	66.08	236.15
53	MWD	6945	1.80	196.30	96	6944.27	-55.88	39.37	S	55.88	W	68.35	234.83
54	MWD	7040	1.80	190.70	95	7039.22	-56.57	42.27	S	56.57	W	70.62	233.24
55	MWD	7135	1.40	188.20	95	7134.18	-57.02	44.88	S	57.02	W	72.56	231.79
56	MWD	7231	1.80	186.80	96	7230.15	-57.36	47.54	S	57.36	W	74.50	230.35
57	MWD	7326	1.60	187.50	95	7325.10	-57.71	50.33	S	57.71	W	76.58	228.91
58	MWD	7422	1.80	207.40	96	7421.06	-58.58	53.00	S	58.58	W	79.00	227.86
59	MWD	7517	1.70	202.40	95	7516.02	-59.80	55.63	S	59.80	W	81.68	227.07
60	MWD	7613	1.00	225.60	96	7611.99	-60.95	57.53	S	60.95	W	83.81	226.65
61	MWD	7708	0.80	195.20	95	7706.98	-61.71	58.75	S	61.71	W	85.21	226.41
62	MWD	7804	0.60	235.00	96	7802.97	-62.30	59.69	S	62.30	W	86.28	226.23
63	MWD	7899	0.90	210.00	95	7897.97	-63.08	60.62	S	63.08	W	87.49	226.14
64	MWD	7994	0.60	255.80	95	7992.96	-63.94	61.39	S	63.94	W	88.63	226.17
65	MWD	8090	1.00	241.30	96	8088.95	-65.16	61.91	S	65.16	W	89.88	226.46
66	MWD	8185	0.90	251.70	95	8183.94	-66.59	62.54	S	66.59	W	91.36	226.80
67	MWD	8281	0.80	256.30	96	8279.93	-67.96	62.94	S	67.96	W	92.63	227.20
68	MWD	8376	0.50	237.20	95	8374.92	-68.95	63.32	S	68.95	W	93.62	227.44
69	MWD	8471	0.70	243.00	95	8469.91	-69.82	63.81	S	69.82	W	94.58	227.57
70	MWD	8567	0.80	244.60	96	8565.91	-70.95	64.36	S	70.95	W	95.79	227.79
71	MWD	8662	0.90	249.30	95	8660.90	-72.24	64.91	S	72.24	W	97.12	228.06
72	MWD	8758	0.50	274.10	96	8756.89	-73.37	65.15	S	73.37	W	98.12	228.40
73	MWD	8853	0.50	242.20	95	8851.88	-74.15	65.31	S	74.15	W	98.81	228.62
74	MWD	8948	0.80	240.60	95	8946.88	-75.09	65.83	S	75.09	W	99.86	228.76
75	MWD	9044	0.60	276.40	96	9042.87	-76.17	66.10	S	76.17	W	100.86	229.05
76	MWD	9139	0.70	281.00	95	9137.87	-77.24	65.94	S	77.24	W	101.55	229.51
77	MWD	9232	0.70	239.60	93	9230.86	-78.29	66.12	S	78.29	W	102.47	229.82
78	MWD	9327	0.70	275.40	95	9325.85	-79.36	66.36	S	79.36	W	103.45	230.10
79	MWD	9423	1.00	261.40	96	9421.84	-80.78	66.43	S	80.78	W	104.58	230.57
80	MWD	9518	0.70	263.80	95	9516.83	-82.17	66.61	S	82.17	W	105.78	230.97
81	MWD	9613	0.70	239.60	95	9611.82	-83.25	66.97	S	83.25	W	106.84	231.19
82	MWD	9709	0.90	261.50	96	9707.82	-84.50	67.38	S	84.50	W	108.07	231.43
83	MWD	9804	1.10	227.90	95	9802.80	-85.92	68.10	S	85.92	W	109.63	231.60
84	MWD	9891	1.10	241.30	87	9889.79	-87.27	69.06	S	87.27	W	111.29	231.64

Operator:	Oasis Petroleum
Well :	Chalmers 5300 31-19H
MWD Providers	Ryan
Directional Supervision:	RPM

Section:	19	QQ:	NW	County:	McKenzie	State:	ND
Township:	153	N/S:	N	Footages:	1535	FN/SL:	S
Range:	100	E/W:	W		375	FE/WL:	W

Vertical Section Plane: 90

#	MD	Inc.	Azm.	T.V.D.	Ver. Sect.	Coordinates +N/-S	Coordinates +E/-W	DLS
Tie	9891.00	1.10	241.30	9889.79	-87.27	-69.06	-87.27	0.30
1	9990.00	0.90	244.70	9988.77	-88.81	-69.85	-88.81	0.21
2	10027.00	1.00	241.70	10025.77	-89.35	-70.13	-89.35	0.30
3	10059.00	1.00	252.50	10057.76	-89.87	-70.34	-89.87	0.59
4	10091.00	0.10	331.50	10089.76	-90.15	-70.40	-90.15	3.08
5	10123.00	3.90	87.80	10121.74	-89.07	-70.34	-89.07	12.33
6	10154.00	7.40	88.40	10152.58	-86.02	-70.24	-86.02	11.29
7	10186.00	10.60	88.50	10184.19	-81.02	-70.10	-81.02	10.00
8	10218.00	14.20	91.20	10215.43	-74.15	-70.11	-74.15	11.39
9	10250.00	18.10	90.60	10246.17	-65.25	-70.24	-65.25	12.20
10	10280.00	22.00	95.50	10274.34	-54.99	-70.83	-54.99	14.14
11	10312.00	25.80	96.70	10303.59	-42.11	-72.22	-42.11	11.97
12	10344.00	29.90	97.10	10331.88	-27.27	-74.02	-27.27	12.83
13	10376.00	34.10	96.20	10359.01	-10.43	-75.97	-10.43	13.21
14	10408.00	38.20	96.80	10384.85	8.32	-78.11	8.32	12.86
15	10439.00	42.30	94.70	10408.50	28.25	-80.11	28.25	13.93
16	10471.00	45.50	92.20	10431.56	50.39	-81.43	50.39	11.37
17	10503.00	48.50	88.50	10453.39	73.78	-81.55	73.78	12.62
18	10535.00	52.70	87.20	10473.69	98.48	-80.61	98.48	13.49
19	10566.00	56.90	88.30	10491.56	123.79	-79.63	123.79	13.85
20	10598.00	61.10	89.50	10508.04	151.21	-79.11	151.21	13.51
21	10630.00	63.50	88.20	10522.91	179.53	-78.53	179.53	8.32
22	10662.00	65.50	89.00	10536.69	208.40	-77.83	208.40	6.64
23	10694.00	66.60	90.50	10549.68	237.65	-77.70	237.65	5.49
24	10725.00	68.10	90.60	10561.62	266.25	-77.98	266.25	4.85
25	10757.00	72.60	89.50	10572.37	296.38	-78.00	296.38	14.43
26	10789.00	78.00	89.90	10580.49	327.32	-77.84	327.32	16.92
27	10821.00	83.50	88.90	10585.63	358.89	-77.51	358.89	17.46
28	10840.00	85.50	89.00	10587.45	377.80	-77.16	377.80	10.54
29	10902.00	86.90	85.80	10591.56	439.59	-74.35	439.59	5.62
30	10934.00	86.80	88.00	10593.32	471.49	-72.63	471.49	6.87
31	11029.00	89.50	89.90	10596.39	566.42	-70.89	566.42	3.47

32	11124.00	89.40	90.70	10597.30	661.41	-71.39	661.41	0.85
33	11220.00	89.50	90.60	10598.22	757.40	-72.47	757.40	0.15
34	11315.00	88.30	90.80	10600.05	852.37	-73.63	852.37	1.28
35	11412.00	88.50	90.10	10602.75	949.33	-74.40	949.33	0.75
36	11508.00	89.00	88.80	10604.85	1045.30	-73.47	1045.30	1.45
37	11604.00	88.80	88.30	10606.69	1141.25	-71.05	1141.25	0.56
38	11698.00	89.80	88.20	10607.84	1235.20	-68.18	1235.20	1.07
39	11793.00	89.90	88.00	10608.09	1330.15	-65.03	1330.15	0.24
40	11888.00	89.80	86.80	10608.34	1425.05	-60.72	1425.05	1.27
41	11985.00	89.50	87.70	10608.93	1521.93	-56.06	1521.93	0.98
42	12080.00	87.80	89.80	10611.17	1616.88	-53.99	1616.88	2.84
43	12175.00	89.70	90.70	10613.24	1711.85	-54.41	1711.85	2.21
44	12268.00	89.40	90.30	10613.97	1804.84	-55.22	1804.84	0.54
45	12359.00	89.40	89.60	10614.92	1895.83	-55.14	1895.83	0.77
46	12451.00	89.90	90.30	10615.49	1987.83	-55.06	1987.83	0.94
47	12543.00	89.80	90.20	10615.73	2079.83	-55.46	2079.83	0.15
48	12634.00	89.00	89.50	10616.68	2170.82	-55.22	2170.82	1.17
49	12725.00	90.60	90.00	10617.00	2261.82	-54.82	2261.82	1.84
50	12817.00	89.10	89.40	10617.24	2353.81	-54.34	2353.81	1.76
51	12909.00	89.30	89.40	10618.52	2445.80	-53.38	2445.80	0.22
52	13001.00	89.50	90.60	10619.49	2537.79	-53.38	2537.79	1.32
53	13092.00	93.40	92.00	10617.18	2628.72	-55.44	2628.72	4.55
54	13184.00	92.80	92.50	10612.21	2720.52	-59.05	2720.52	0.85
55	13267.00	92.80	92.50	10608.15	2803.34	-62.66	2803.34	0.00

Operator:	**Oasis Petroleum**
Well :	Chalmers 5300 31-19H
MWD Providers	Ryan
Directional Supervision:	RPM

Section:	19	QQ:	NE SW	County:	McKenzie	State:	ND
Township:	153	N/S:	N	Footages:	1,472.34	FN/SL:	S
Range:	100	E/W:	W		3,178.34	FE/WL:	W

Vertical Section Plane: **90.00**

#	MD	Inc.	Azm.	T.V.D.	Ver. Sect.	Coordinates +N / -S	Coordinates +E / -W	DLS
Tie	13001.00	89.50	90.60	10619.35	2537.73	-55.62	2537.73	1.32
1	13062.00	89.80	91.30	10619.72	2598.72	-56.63	2598.72	1.25
2	13092.00	88.00	91.10	10620.30	2628.71	-57.26	2628.71	6.04
3	13123.00	88.00	90.80	10621.38	2659.68	-57.77	2659.68	0.97
4	13153.00	87.90	91.30	10622.45	2689.66	-58.32	2689.66	1.70
5	13184.00	88.10	90.90	10623.54	2720.63	-58.92	2720.63	1.44
6	13275.00	88.30	90.90	10626.39	2811.58	-60.35	2811.58	0.22
7	13367.00	90.50	91.80	10627.36	2903.54	-62.51	2903.54	2.58
8	13459.00	88.20	92.20	10628.40	2995.47	-65.72	2995.47	2.54
9	13550.00	88.90	92.70	10630.70	3086.36	-69.61	3086.36	0.95
10	13581.00	89.60	93.20	10631.11	3117.32	-71.21	3117.32	2.77
11	13642.00	89.00	93.20	10631.85	3178.22	-74.61	3178.22	0.98
12	13733.00	89.00	93.50	10633.44	3269.05	-79.93	3269.05	0.33
13	13824.00	89.70	93.60	10634.48	3359.87	-85.56	3359.87	0.78
14	13916.00	88.20	93.00	10636.16	3451.69	-90.86	3451.69	1.76
15	14007.00	88.30	92.60	10638.94	3542.54	-95.30	3542.54	0.45
16	14099.00	88.80	93.40	10641.27	3634.39	-100.12	3634.39	1.03
17	14159.00	89.90	92.30	10641.95	3694.31	-103.10	3694.31	2.59
18	14190.00	90.20	92.20	10641.92	3725.28	-104.32	3725.28	1.02
19	14220.00	90.70	92.90	10641.69	3755.25	-105.65	3755.25	2.87
20	14281.00	91.20	92.20	10640.67	3816.18	-108.36	3816.18	1.41
21	14373.00	88.50	90.80	10640.92	3908.14	-110.77	3908.14	3.31
22	14468.00	89.70	91.60	10642.41	4003.10	-112.76	4003.10	1.52
23	14563.00	89.90	89.90	10642.74	4098.09	-114.00	4098.09	1.80
24	14659.00	90.40	91.70	10642.49	4194.08	-115.34	4194.08	1.95
25	14754.00	89.50	90.00	10642.57	4289.06	-116.75	4289.06	2.02
26	14850.00	90.20	90.60	10642.82	4385.06	-117.26	4385.06	0.96
27	14946.00	89.40	89.80	10643.16	4481.06	-117.59	4481.06	1.18
28	15041.00	87.60	88.90	10645.64	4576.01	-116.51	4576.01	2.12
29	15137.00	89.50	90.10	10648.07	4671.97	-115.68	4671.97	2.34
30	15232.00	88.70	90.60	10649.57	4766.96	-116.26	4766.96	0.99
31	15264.00	89.00	90.90	10650.21	4798.95	-116.68	4798.95	1.33
32	15328.00	89.80	90.60	10650.88	4862.94	-117.51	4862.94	1.33
33	15360.00	89.80	89.90	10650.99	4894.94	-117.65	4894.94	2.19

34	15424.00	88.50	88.50	10651.94	4958.92	-116.76	4958.92	2.98
35	15520.00	89.10	89.00	10653.95	5054.88	-114.67	5054.88	0.81
36	15583.00	89.80	89.10	10654.55	5117.87	-113.62	5117.87	1.12
37	15615.00	89.50	89.10	10654.75	5149.86	-113.12	5149.86	0.94
38	15679.00	88.50	89.10	10655.87	5213.84	-112.11	5213.84	1.56
39	15710.00	88.40	89.30	10656.71	5244.83	-111.68	5244.83	0.72
40	15806.00	87.40	88.60	10660.22	5340.75	-109.92	5340.75	1.27
41	15838.00	87.50	88.60	10661.65	5372.71	-109.14	5372.71	0.31
42	15902.00	88.00	88.00	10664.16	5436.63	-107.25	5436.63	1.22
43	15997.00	87.80	88.00	10667.64	5531.51	-103.93	5531.51	0.21
44	16029.00	87.70	87.70	10668.90	5563.46	-102.73	5563.46	0.99
45	16092.00	88.80	88.30	10670.82	5626.39	-100.54	5626.39	1.99
46	16124.00	89.30	88.30	10671.35	5658.37	-99.59	5658.37	1.56
47	16188.00	89.40	88.30	10672.08	5722.34	-97.69	5722.34	0.16
48	16220.00	89.60	88.50	10672.36	5754.33	-96.79	5754.33	0.88
49	16283.00	90.30	88.30	10672.41	5817.30	-95.04	5817.30	1.16
50	16378.00	90.90	88.20	10671.42	5912.25	-92.13	5912.25	0.64
51	16474.00	89.70	88.30	10670.91	6008.20	-89.20	6008.20	1.25
52	16570.00	89.70	87.70	10671.42	6104.14	-85.85	6104.14	0.62
53	16634.00	90.20	87.20	10671.47	6168.08	-83.01	6168.08	1.10
54	16665.00	90.00	87.30	10671.42	6199.04	-81.52	6199.04	0.72
55	16758.00	88.70	88.20	10672.47	6291.96	-77.87	6291.96	1.70
56	16854.00	89.40	88.10	10674.07	6387.90	-74.77	6387.90	0.74
57	16950.00	90.20	87.80	10674.40	6483.84	-71.33	6483.84	0.89
58	17045.00	89.10	89.00	10674.98	6578.79	-68.68	6578.79	1.71
59	17140.00	89.40	87.80	10676.22	6673.75	-66.03	6673.75	1.30
60	17236.00	89.10	87.50	10677.48	6769.66	-62.09	6769.66	0.44
61	17332.00	89.40	87.30	10678.74	6865.55	-57.74	6865.55	0.38
62	17428.00	89.40	87.00	10679.74	6961.43	-52.97	6961.43	0.31
63	17524.00	89.90	86.60	10680.33	7057.27	-47.61	7057.27	0.67
64	17619.00	89.90	88.40	10680.49	7152.18	-43.46	7152.18	1.89
65	17683.00	89.30	87.40	10680.94	7216.13	-41.12	7216.13	1.82
66	17715.00	88.40	86.90	10681.58	7248.09	-39.53	7248.09	3.22
67	17778.00	88.30	86.70	10683.40	7310.96	-36.01	7310.96	0.35
68	17810.00	88.10	87.00	10684.40	7342.90	-34.25	7342.90	1.13
69	17906.00	89.80	88.20	10686.16	7438.79	-30.24	7438.79	2.17
70	17999.00	90.20	87.80	10686.16	7531.74	-26.99	7531.74	0.61
71	18095.00	89.40	87.00	10686.50	7627.64	-22.64	7627.64	1.18
72	18191.00	89.40	86.20	10687.50	7723.46	-16.94	7723.46	0.83
73	18287.00	89.60	86.60	10688.34	7819.27	-10.91	7819.27	0.47
74	18319.00	89.80	86.70	10688.51	7851.21	-9.04	7851.21	0.70
75	18382.00	90.10	87.70	10688.56	7914.14	-5.97	7914.14	1.66
76	18478.00	89.00	88.30	10689.32	8010.07	-2.62	8010.07	1.31
77	18573.00	88.00	88.80	10691.80	8105.01	-0.21	8105.01	1.18
78	18669.00	88.50	87.80	10694.74	8200.92	2.63	8200.92	1.16
79	18764.00	88.80	88.80	10696.97	8295.85	5.45	8295.85	1.10
80	18859.00	89.80	88.20	10698.13	8390.81	7.94	8390.81	1.23

81	18954.00	89.40	87.40	10698.80	8485.74	11.58	8485.74	0.94
82	19050.00	90.20	87.90	10699.13	8581.65	15.52	8581.65	0.98
83	19145.00	89.40	86.90	10699.46	8676.55	19.83	8676.55	1.35
84	19240.00	89.80	86.80	10700.13	8771.41	25.05	8771.41	0.43
85	19336.00	89.90	85.60	10700.38	8867.19	31.41	8867.19	1.25
86	19431.00	90.40	86.00	10700.13	8961.94	38.37	8961.94	0.67
87	19527.00	89.90	85.40	10699.88	9057.67	45.57	9057.67	0.81
88	19623.00	89.20	83.90	10700.63	9153.24	54.52	9153.24	1.72
89	19719.00	89.70	84.50	10701.55	9248.75	64.22	9248.75	0.81
90	19815.00	90.00	85.20	10701.81	9344.36	72.84	9344.36	0.79
91	19910.00	89.80	83.50	10701.97	9438.89	82.19	9438.89	1.80
92	20006.00	90.20	82.60	10701.97	9534.18	93.80	9534.18	1.03
93	20102.00	90.80	81.80	10701.13	9629.29	106.83	9629.29	1.04
94	20197.00	91.10	82.30	10699.56	9723.37	119.97	9723.37	0.61
95	20249.00	90.90	81.70	10698.65	9774.85	127.21	9774.85	1.22
96	20300.00	90.90	81.70	10697.85	9825.31	134.57	9825.31	0.00

RPM Geologic

LITHOLOGY

Rig crews caught lagged samples in 30' intervals in the vertical hole from 8,120 to 10,700' MD and 10,840' to TD (20,300'). 10' Samples were collected in the curve from 10,700 to 10,840'.

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

Drilling vertical hole above the Kibbey Lime Formation

8120-8150 SHALE: orange to red, light brown in part, trace light gray, firm to soft, sub blocky to sub platey, earthy texture, slight to moderately calcareous, silty in part; SILTSTONE: orange to red, very fine grained, friable, sub angular, very well sorted, calcareous cement

8150-8180 SHALE: orange to red, light brown in part, trace light gray, firm to soft, sub blocky to sub platey, earthy texture, slight to moderately calcareous, silty in part; SILTSTONE: orange to red, very fine grained, friable, sub angular, very well sorted, calcareous cement

8180-8225 SHALE: orange to red, light brown in part, trace light gray, firm to soft, sub blocky to sub platey, earthy texture, slight to moderately calcareous, silty in part; SILTSTONE: orange to red, very fine grained, friable, sub angular, very well sorted, calcareous cement

Kibbey Lime — *8,225' TVD (-6,296')*

8225-8238 ANHYDRITE: reddish orange, white, soft, amorphous texture

8238-8260 LIMESTONE: mudstone, off white, cream, light brown, firm to hard, microcrystalline, crystalline texture, common fossils fragment, good visible porosity

8260-8300 SHALE: orange to red, light brown in part, trace light gray, firm to soft, sub blocky to sub platey, earthy texture, slight to moderately calcareous; occasional SILTSTONE: orange to red, very fine grained, friable, sub angular, very well sorted, calcareous cement

8300-8330 SHALE: orange to red, light brown in part, trace light gray, firm to soft, sub blocky to sub platey, earthy texture, slight to moderately calcareous; occasional SILTSTONE: orange to red, very fine grained, friable, sub angular, very well sorted, calcareous cement

8330-8376 SHALE: orange to red, light brown in part, trace light gray, firm to soft, sub blocky to sub platey, earthy texture, slight to moderately calcareous; occasional LIMESTONE: wackestone, off white, cream, light brown, firm to hard, microcrystalline, crystalline texture, common fossils fragment, good visible porosity; trace ANHYDRITE: white, soft, amorphous texture

Charles Salt Formation ***8,376' TVD (-6,447')***

8376-8390 SALT: clear, milky, translucent, crystalline, hard, euhedral to sub hedral, crystalline texture; occasional SHALE: orange to red, light brown in part, trace light gray, firm to soft, sub blocky to sub platey, earthy texture, slight to moderately calcareous; trace ANHYDRITE: white, soft, amorphous texture

8390-8420 SALT: clear, milky, translucent, crystalline, hard, euhedral to sub hedral, crystalline texture; SHALE: orange to red, light brown in part, trace light gray, firm to soft, sub blocky to sub platey, earthy texture, slight to moderately calcareous; trace ANHYDRITE: white, soft, amorphous texture

8420-8450 SALT: clear, milky, translucent, crystalline, hard, euhedral to sub hedral, crystalline texture; occasional SHALE: orange to red, light brown in part, trace light gray, firm to soft, sub blocky to sub platey, earthy texture, slight to moderately calcareous; trace ANHYDRITE: white, soft, amorphous texture

8450-8480 SALT: clear, milky, translucent, crystalline, hard, euhedral to sub hedral, crystalline texture; SHALE: orange to red, light brown in part, trace light gray, firm to soft, sub blocky to sub platey, earthy texture, slight to moderately calcareous; trace ANHYDRITE: white, soft, amorphous texture

8480-8510 SALT: clear, milky, translucent, crystalline, hard, euhedral to sub hedral, crystalline texture; occasional SHALE: orange to red, light brown, gray in part, trace light gray, firm to soft, sub blocky to sub platey, earthy texture, slight to moderately calcareous; trace ANHYDRITE: white, soft, amorphous texture

8510-8553 SALT: clear, milky, translucent, crystalline, hard, euhedral to sub hedral, crystalline texture; trace SHALE: orange to red, light brown, gray in part, trace light gray, firm to soft, sub blocky to sub platey, earthy texture, slight to moderately calcareous

8553-8580 ARGILLACEOUS LIMESTONE: mudstone, cream, light gray, firm to hard, microcrystalline texture, trace fossils fragment, trace oil stain

8580-8600 SALT: clear, milky, translucent, crystalline, hard, euhedral to sub hedral, crystalline texture; trace SHALE: orange to red, light brown, gray in part, trace light gray, firm to soft, sub blocky to sub platey, earthy texture, slight to moderately calcareous, ARGILLACEOUS LIMESTONE: mudstone, light to medium gray, firm, crystalline texture, trace fossil fragment

8600-8630 SALT: clear, milky, translucent, crystalline, hard, euhedral to sub hedral, crystalline texture; trace SHALE: orange to red, light brown, gray in part, trace light gray, firm to soft, sub blocky to sub platey, earthy texture, slight to moderately calcareous, trace ARGILLACEOUS LIMESTONE: mudstone, light to medium gray, firm, crystalline texture, trace fossil fragment

8630-8650 SALT: clear, milky, translucent, crystalline, hard, euhedral to subhedral, crystalline texture; trace ARGILLACEOUS LIMESTONE: mudstone, light to medium gray, firm, crystalline texture, trace fossils fragment, trace pellets

8650-8680 ARGILLACEOUS LIMESTONE: mudstone, cream, light gray, firm to hard, microcrystalline texture, trace fossils fragment, trace oil stain; occasional SALT: clear, milky, translucent, crystalline, hard, euhedral to subhedral, crystalline texture; trace ANHYDRITE: white, soft, amorphous texture

8680-8734 SALT: clear, milky, translucent, crystalline, hard, euhedral to subhedral, crystalline texture; occasional ARGILLACEOUS LIMESTONE: mudstone, cream, light gray, firm to hard, microcrystalline texture, trace fossils fragment, trace oil stain

8734-8780 ARGILLACEOUS LIMESTONE: mudstone to wackestone, light to medium gray, occasional light brown, firm to hard, microcrystalline texture, algal matting, trace fossils fragment, occasional oil stain; occasional SALT: clear, milky, crystalline, hard, euhedral to sub hedral, crystalline texture

8780-8810 ARGILLACEOUS LIMESTONE: mudstone to wackestone, light to medium gray, tan to light brown, cream to white, firm to hard, microcrystalline texture, trace disseminated pyrite, occasional algal matting, trace fossils fragment, occasional oil stain; trace SALT: clear, milky, crystalline, hard, euhedral to subhedral, crystalline texture; trace ANHYDRITE: white, soft, amorphous texture

8810-8834 ARGILLACEOUS LIMESTONE: mudstone to wackestone, light to medium gray, tan to light brown, firm to hard, microcrystalline texture, trace disseminated pyrite, occasional algal matting, trace fossils fragment, occasional oil stain; trace ANHYDRITE: white, soft, amorphous texture

8834-8854 SALT: clear, milky, crystalline, hard, euhedral to sub hedral, crystalline texture

8854-8870 ARGILLACEOUS LIMESTONE: mudstone to wackestone, light to medium gray, tan to light brown, firm to hard, microcrystalline texture, occasional algal matting, trace fossils fragment, occasional oil stain; SALT: clear, milky, crystalline, hard, euhedral to subhedral, crystalline texture; trace ANHYDRITE: white, soft, amorphous texture

8870-8900 ARGILLACEOUS LIMESTONE: mudstone to wackestone, light to medium gray, tan to light brown, firm to hard, microcrystalline texture, occasional algal matting, trace fossils fragment, occasional oil stain; ANHYDRITE: white, soft, amorphous texture

8900-8936 ARGILLACEOUS LIMESTONE: mudstone to wackestone, medium to dark gray, firm to hard, microcrystalline texture, occasional algal matting, trace fossils fragment, common oil stain

8936-8950 ANHYDRITE: white, soft, amorphous texture

8950-8990 ARGILLACEOUS LIMESTONE: mudstone to wackestone, light to medium gray, tan to light brown, firm to hard, microcrystalline texture, occasional algal matting, trace fossils fragment, occasional oil stain; trace ANHYDRITE: white, soft, amorphous texture

8990-9043 SALT: clear, milky, crystalline, hard, euhedral to subhedral, crystalline texture

Base Charles Salt ***9,043' TVD (-7,114')***

9043-9080 LIMESTONE: mudstone to wackestone, light to medium gray, tan to light brown, firm to hard, microcrystalline texture, mottled appearance, argillaceous in part, trace fossils fragment, possible fracture porosity, trace oil stain; trace ANHYDRITE: white, soft, amorphous texture

9080-9110 ARGILLACEOUS LIMESTONE: wackestone, light to medium gray, occasional dark gray, tan to light brown, firm to hard, microcrystalline texture, trace fossils fragment, possible fracture porosity, trace oil stain; trace ANHYDRITE: white, soft, amorphous texture

9110-9140 ARGILLACEOUS LIMESTONE: wackestone, medium gray, occasional dark gray, tan to light brown, firm to hard, microcrystalline texture, trace fossils fragment, possible fracture porosity, trace oil stain; trace ANHYDRITE: white, soft, amorphous texture

9140-9170 ARGILLACEOUS LIMESTONE: wackestone, medium gray, occasional dark gray, tan to light brown, firm to hard, microcrystalline texture, trace fossils fragment, possible fracture porosity, trace oil stain; trace ANHYDRITE: white, soft, amorphous texture

9170-9200 ARGILLACEOUS LIMESTONE: wackestone, medium gray, occasional dark gray, tan to light brown, firm to hard, microcrystalline texture, trace fossils fragment, possible fracture porosity, trace oil stain

9200-9230 ARGILLACEOUS LIMESTONE: wackestone, medium gray, occasional dark gray, tan to light brown, firm to hard, microcrystalline texture, dolomitic in part, trace fossils fragment, possible fracture porosity, trace oil stain

9230-9260 ARGILLACEOUS LIMESTONE: wackestone, medium gray, occasional dark gray, tan to light brown, firm to hard, microcrystalline texture, dolomitic in part, trace fossils fragment, possible fracture porosity, trace oil stain

9260-9281 LIMESTONE: mudstone, gray to brown, firm to hard, microcrystalline texture, trace fracture porosity, trace oil stain

Mission Canyon Formation ***9,281' TVD (-7,352')***

9281-9320 ARGILLACEOUS LIMESTONE: wackestone, dark to medium gray, mottled in part, firm to hard, microcrystalline texture, dolomitic in part, trace fossils fragment, possible fracture porosity, trace oil stain

9320-9350 ARGILLACEOUS LIMESTONE: wackestone, dark to medium gray, mottled in part, firm to hard, microcrystalline texture, dolomitic in part, trace fossils fragment, possible fracture porosity, trace oil stain

9350-9380 ARGILLACEOUS LIMESTONE: wackestone, dark to medium gray, mottled in part, firm to hard, microcrystalline texture, dolomitic in part, trace fossils fragment, possible fracture porosity, trace oil stain

9380-9410 ARGILLACEOUS LIMESTONE: wackestone, dark to medium gray, mottled in part, firm to hard, microcrystalline texture, dolomitic in part, trace fossils fragment, possible fracture porosity, trace oil stain

9410-9440 ARGILLACEOUS LIMESTONE: wackestone, dark to medium gray, mottled in part, firm to hard, microcrystalline texture, dolomitic in part, trace fossils fragment, possible fracture porosity, trace oil stain

9440-9470 ARGILLACEOUS LIMESTONE: wackestone, light brown to tan, light to medium gray, mottled in part, firm to hard, microcrystalline texture, dolomitic in part, trace fossils fragment, possible fracture porosity, trace oil stain

9470-9500 ARGILLACEOUS LIMESTONE: wackestone, light brown to tan, light to medium gray, mottled in part, firm to hard, microcrystalline texture, dolomitic in part, trace fossils fragment, possible fracture porosity, trace oil stain

9500-9530 ARGILLACEOUS LIMESTONE: wackestone, light brown to tan, light to medium gray, mottled in part, firm to hard, microcrystalline texture, dolomitic in part, trace fossils fragment, possible fracture porosity, trace oil stain

9530-9560 LIMESTONE: mudstone, light brown to tan, light to medium gray, mottled in part, firm to hard, microcrystalline texture, dolomitic in part, trace fossils fragment, possible fracture porosity, trace oil stain

9560-9590 LIMESTONE: mudstone, light brown to tan, light to medium gray, mottled in part, firm to hard, microcrystalline texture, dolomitic in part, trace fossils fragment, possible fracture porosity, trace oil stain

9590-9620 LIMESTONE: mudstone, light brown to tan, dark gray, microcrystalline, firm to hard, crystalline texture, trace fossils fragment, trace oil stain

9620-9650 LIMESTONE: mudstone, light brown to tan, dark gray, microcrystalline, firm to hard, crystalline texture, trace fossils fragment, trace oil stain

9650-9680 LIMESTONE: mudstone, light brown to tan, dark gray, microcrystalline, firm to hard, crystalline texture, trace fossils fragment, trace oil stain

9680-9710 LIMESTONE: mudstone, light brown to tan, dark gray, microcrystalline, firm to hard, crystalline texture, trace fossils fragment, trace oil stain

9710-9740 ARGILLACEOUS LIMESTONE: wackestone, light brown to tan, dark gray, microcrystalline, firm to hard, crystalline texture, trace fossils fragment, intergranular porosity trace oil stain

9740-9770 ARGILLACEOUS LIMESTONE: wackestone, light brown to tan, dark gray, microcrystalline, firm to hard, crystalline texture, trace fossils fragment, intergranular porosity, trace oil stain

9770-9800 ARGILLACEOUS LIMESTONE: wackestone, light brown to tan, dark gray, microcrystalline, firm to hard, crystalline texture, trace fossils fragment, oil stain, intergranular porosity

9800-9839 LIMESTONE: mudstone to wackestone, cream to white, trace light brown to tan, trace very dark gray, microcrystalline, blocky, firm to hard, crystalline texture, trace fossils fragments, trace algal matting, intergranular porosity, trace oil stain

Lodgepole Formation ***9,839' TVD (-7,910')***

9839-9860 LIMESTONE: mudstone to wackestone, cream to white, trace light brown to tan, trace very dark gray, microcrystalline, blocky, firm to hard, crystalline texture, trace fossils fragments, trace algal matting, intergranular porosity, trace oil stain

9860-9890 LIMESTONE: mudstone to wackestone, very dark gray, microcrystalline, blocky, firm to hard, crystalline texture, trace fossils fragments, trace algal matting, intergranular porosity, trace oil stain

9890-9920 ARGILLACEOUS LIMESTONE: wackestone, light brown to tan, cream to white, trace very dark gray, microcrystalline, blocky, firm to hard, crystalline texture, trace fossils fragments, trace algal matting, intergranular porosity, trace oil stain

9920-9948 ARGILLACEOUS LIMESTONE: wackestone, light brown to tan, light to medium gray, trace cream to white, trace very dark gray, microcrystalline, blocky, firm to hard, crystalline texture, trace fossils fragments, trace algal matting, intergranular porosity, trace oil stain

9948-10000 ARGILLACEOUS LIMESTONE: wackestone, dark gray, microcrystalline, hard to firm, earthy texture, no visible porosity, trace visible oil stain

10000-10050 ARGILLACEOUS LIMESTONE: wackestone, dark gray, microcrystalline, hard to firm, earthy texture, no visible porosity, trace visible oil stain

10050-10100 ARGILLACEOUS LIMESTONE: wackestone, dark gray, microcrystalline, hard to firm, earthy texture, no visible porosity, trace visible oil stain

10100-10150 ARGILLACEOUS LIMESTONE: wackestone, dark gray, microcrystalline, hard to firm, earthy texture, no visible porosity, trace visible oil stain

10150-10200 ARGILLACEOUS LIMESTONE: wackestone, dark gray, microcrystalline, hard to firm, earthy texture, no visible porosity, trace visible oil stain

10200-10250 ARGILLACEOUS LIMESTONE: wackestone, dark to medium gray, microcrystalline, hard to firm, earthy texture, no visible porosity, trace visible oil stain

10250-10300 ARGILLACEOUS LIMESTONE: wackestone, dark to medium gray, microcrystalline, hard to firm, earthy texture, no visible porosity, trace visible oil stain

10300-10350 ARGILLACEOUS LIMESTONE: wackestone, dark to medium gray, microcrystalline, hard to firm, earthy texture, no visible porosity, trace visible oil stain

10350-10400 ARGILLACEOUS LIMESTONE: wackestone, dark to medium gray, microcrystalline, hard to firm, earthy texture, no visible porosity, trace visible oil stain

10400-10450 ARGILLACEOUS LIMESTONE: wackestone, dark to medium gray, microcrystalline, hard to firm, earthy texture, no visible porosity, trace visible oil stain

10450-10500 ARGILLACEOUS LIMESTONE: wackestone, dark to medium gray, microcrystalline, hard to firm, earthy texture, no visible porosity, trace visible oil stain

10500-10550 ARGILLACEOUS LIMESTONE: wackestone, dark to medium gray, microcrystalline, hard to firm, earthy texture, no visible porosity, trace visible oil stain

10550-10600 ARGILLACEOUS LIMESTONE: wackestone, dark to medium gray, microcrystalline, hard to firm, earthy texture, no visible porosity, trace visible oil stain

10600-10650 ARGILLACEOUS LIMESTONE: wackestone, dark to medium gray, microcrystalline, hard to firm, earthy texture, no visible porosity, trace visible oil stain

10650-10696 ARGILLACEOUS LIMESTONE: wackestone, dark to medium gray, microcrystalline, hard to firm, earthy texture, no visible porosity, trace visible oil stain

False Bakken ***10,696' MD / 10,550' TVD (-8,621')***

10696-10714 SHALE: very dark gray to brown, sub blocky to blocky, friable to firm, smooth hard, waxy texture, calcareous, occasional disseminated pyrite, no visible oil stain

10714-10736 ARGILLACEOUS LIMESTONE: wackestone, dark to medium gray, microcrystalline, hard to firm, earthy texture, no visible porosity, trace visible oil stain

Bakken Formation, Upper Shale ***10,736' MD / 10,566' TVD (-8,637')***

10736-10806 SHALE: very dark brown, black, sub blocky to blocky, friable, hard, waxy texture, slight calcareous, trace disseminated and nodular pyrite, carbonaceous, abundant visible oil stain, possible fracture porosity

Bakken Formation, Middle Member ***10,806' MD / 10,583' TVD (-8,654')***

10806-10850 SILTSTONE: gray to brown, very fine grained, firm to friable, sub rounded to sub angular, vitreous, slight to not calcareous, well sorted, poorly cemented, trace disseminated pyrite, trace patchy oil stain, trace intergranular porosity

10850-10900 SILTSTONE: gray to brown, very fine grained, firm to friable, sub rounded to sub angular, vitreous, slight to not calcareous, well sorted, poorly cemented, trace disseminated pyrite, trace patchy oil stain, trace intergranular porosity

10900-10940 SILTSTONE: gray to brown, very fine grained, firm to friable, sub rounded to sub angular, vitreous, slight to not calcareous, well sorted, poorly cemented, trace disseminated pyrite, trace patchy oil stain, trace intergranular porosity

10940-11000 SILTY SANDSTONE: white to off white, light to medium gray, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional disseminated pyrite, trace intergranular porosity, possible fracture porosity

11000-11050 SILTY SANDSTONE: white to off white, light to medium gray, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional disseminated pyrite, trace intergranular porosity, possible fracture porosity

11050-11100 SILTY SANDSTONE: white to off white, light to medium gray, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional disseminated pyrite, trace intergranular porosity, possible fracture porosity

11100-11150 SILTY SANDSTONE: white to off white, light to medium gray, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional disseminated pyrite, trace intergranular porosity, possible fracture porosity

11150-11200 SILTY SANDSTONE: white to off white, light to medium gray, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional disseminated pyrite, trace intergranular porosity, possible fracture porosity

11200-11250 SILTY SANDSTONE: light to medium gray, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional disseminated pyrite, trace intergranular porosity, possible fracture porosity, fast white streaming cut, weak white diffuse cut

11250-11300 SILTY SANDSTONE: light to medium gray, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, fast white streaming cut, weak white diffuse cut

11300-11350 SILTY SANDSTONE: light to medium gray, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, fast white streaming cut, weak white diffuse cut

11350-11400 SILTY SANDSTONE: light to medium gray, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, fast white streaming cut, weak white diffuse cut

11400-11450 SILTY SANDSTONE: light to medium gray, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, fast abundant white streaming cut, moderately white diffuse cut

11450-11500 SILTY SANDSTONE: light to medium gray, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, fast abundant white streaming cut, moderately white diffuse cut

11500-11550 SILTY SANDSTONE: light to medium gray, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, fast abundant white streaming cut, moderately white diffuse cut

11550-11600 SILTY SANDSTONE: light to medium gray, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, fast abundant white streaming cut, moderately white diffuse cut

11600-11650 SILTY SANDSTONE: light to medium gray, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, fast abundant white streaming cut, strong cream to white diffuse cut

11650-11700 SILTY SANDSTONE: light to medium gray, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, fast abundant white streaming cut, strong cream to white diffuse cut

11700-11750 SILTY SANDSTONE: light to medium gray, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, fast abundant white streaming cut, strong cream to white diffuse cut

11750-11800 SILTY SANDSTONE: light to medium gray, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, fast abundant white streaming cut, strong cream to white diffuse cut

11800-11850 SILTY SANDSTONE: light to medium gray, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, fast abundant white streaming cut, strong cream to white diffuse cut

11850-11900 SILTY SANDSTONE: light to medium gray, off white, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, fast abundant white streaming cut, strong cream to white diffuse cut

11900-11950 SILTY SANDSTONE: light to medium gray, off white, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, fast abundant white streaming cut, strong cream to white diffuse cut

11950-12000 SILTY SANDSTONE: light to medium gray, off white, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, fast abundant white streaming cut, strong cream to white diffuse cut

12000-12050 SILTY SANDSTONE: light to medium gray, off white, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, fast abundant white streaming cut, strong cream to white diffuse cut

12050-12100 SILTY SANDSTONE: light to medium gray, off white, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, fast abundant white streaming cut, strong cream to white diffuse cut

12100-12150 SILTY SANDSTONE: light to medium gray, off white, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, fast abundant white streaming cut, strong cream to white diffuse cut

12150-12200 SILTY SANDSTONE: light to medium gray, off white, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, fast abundant white streaming cut, strong cream to white diffuse cut

12200-12250 SILTY SANDSTONE: light to medium gray, light brown to tan, off white, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, fast abundant white streaming cut, strong cream to white diffuse cut

12250-12300 SILTY SANDSTONE: light to medium gray, light brown to tan, off white, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, fast abundant white streaming cut, strong cream to white diffuse cut

12300-12350 SILTY SANDSTONE: light to medium gray, light brown to tan, off white, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, fast abundant white streaming cut, strong cream to white diffuse cut

12350-12400 SILTY SANDSTONE: light to medium gray, light brown to tan, off white, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, fast abundant white streaming cut, strong cream to white diffuse cut

12400-12450 SILTY SANDSTONE: light to medium gray, light brown to tan, off white, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, fast abundant white streaming cut, strong cream to white diffuse cut

12450-12500 SILTY SANDSTONE: light to medium gray, light brown to tan, off white, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, fast abundant white streaming cut, weak cream to white diffuse cut

12500-12550 SILTY SANDSTONE: light to medium gray, light brown to tan, off white, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, fast abundant white streaming cut, weak cream to white diffuse cut

12550-12600 SILTY SANDSTONE: light to medium gray, light brown to tan, off white, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, fast abundant white streaming cut, weak cream to white diffuse cut

12600-12650 SILTY SANDSTONE: light to medium gray, light brown to tan, off white, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, fast abundant white streaming cut, weak cream to white diffuse cut

12650-12700 SILTY SANDSTONE: light to medium gray, light brown to tan, off white, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, fast abundant white streaming cut, strong cream to white diffuse cut

12700-12750 SILTY SANDSTONE: light to medium gray, light brown to tan, off white, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, fast abundant white streaming cut, strong cream to white diffuse cut

12750-12800 SILTY SANDSTONE: light to medium gray, off white, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, fast abundant white streaming cut, strong cream to white diffuse cut

12800-12850 SILTY SANDSTONE: light to medium gray, off white, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, fast abundant white streaming cut, strong cream to white diffuse cut

12850-12900 SILTY SANDSTONE: light to medium gray, off white, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, slight abundant white streaming cut, weak cream to white diffuse cut

12900-12950 SILTY SANDSTONE: light to medium gray, off white, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, slight abundant white streaming cut, weak cream to white diffuse cut

12950-13000 SILTY SANDSTONE: light to medium gray, off white, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, slight abundant white streaming cut, weak cream to white diffuse cut

13000-13050 SILTY SANDSTONE: light to medium gray, off white, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, slight abundant white streaming cut, weak cream to white diffuse cut

13050-13100 SILTY SANDSTONE: light to medium gray, off white, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, slight abundant white streaming cut, weak cream to white diffuse cut

13100-13150 SILTY SANDSTONE: light to medium gray, light brown, off white, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, slight abundant white streaming cut, weak cream to white diffuse cut

13150-13200 SILTY SANDSTONE: light to medium gray, light brown, off white, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, slight abundant white streaming cut, weak cream to white diffuse cut

13200-13250 SILTY SANDSTONE: light to medium gray, light brown, off white, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, slight abundant white streaming cut, weak cream to white diffuse cut

13250-13300 SILTY SANDSTONE: light to medium gray, light brown, off white, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, slight abundant white streaming cut, weak cream to white diffuse cut

13300-13350 SILTY SANDSTONE: light to medium gray, light brown, off white, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, slight abundant white streaming cut, weak cream to white diffuse cut

13350-13400 SILTY SANDSTONE: light to medium gray, light brown, off white, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, slight abundant white streaming cut, weak cream to white diffuse cut

13400-13450 SILTY SANDSTONE: light to medium gray, light brown, off white, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, slight abundant white streaming cut, weak cream to white diffuse cut

13450-13500 SILTY SANDSTONE: light to medium gray, light brown, off white, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, slight abundant white streaming cut, weak cream to white diffuse cut

13500-13550 SILTY SANDSTONE: light to medium gray, light brown, off white, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, slight abundant white streaming cut, weak cream to white diffuse cut

13550-13600 SILTY SANDSTONE: light to medium gray, light brown, off white, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, slight abundant white streaming cut, weak cream to white diffuse cut

13600-13650 SILTY SANDSTONE: light to medium gray, light brown, off white, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, slight abundant white streaming cut, weak cream to white diffuse cut

13650-13700 SILTY SANDSTONE: light to medium gray, light brown, off white, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, slight abundant white streaming cut, weak cream to white diffuse cut

13700-13750 SILTY SANDSTONE: medium to light gray, light brown, off white, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, slight abundant white streaming cut, weak cream to white diffuse cut

13750-13800 SILTY SANDSTONE: medium to light gray, light brown, off white, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, slight abundant white streaming cut, weak cream to white diffuse cut

13800-13850 SILTY SANDSTONE: medium to light gray, light brown, off white, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, slight abundant white streaming cut, weak cream to white diffuse cut

13850-13900 SILTY SANDSTONE: medium to light gray, light brown, off white, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, slight abundant white streaming cut, weak cream to white diffuse cut

13900-13950 SILTY SANDSTONE: medium to light gray, light brown, off white, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, slight abundant white streaming cut, weak cream to white diffuse cut

13950-14000 SILTY SANDSTONE: medium to light gray, light brown, off white, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, trace patchy oil stain, slight abundant white streaming cut, weak cream to white diffuse cut

14000-14050 SILTY SANDSTONE: medium to light gray, light brown, off white, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, trace patchy oil stain, slight abundant white streaming cut, weak cream to white diffuse cut

14050-14100 SILTY SANDSTONE: medium to light gray, light brown, off white, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, trace patchy oil stain, slight abundant white streaming cut, weak cream to white diffuse cut

14100-14150 SILTY SANDSTONE: medium to light gray, off white, occasional light brown, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, trace patchy oil stain, slight abundant white streaming cut, weak cream to white diffuse cut

14150-14200 SILTY SANDSTONE: medium to light gray, off white, occasional light brown, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, trace patchy oil stain, fast abundant white streaming cut, strong cream to white diffuse cut

14200-14250 SILTY SANDSTONE: medium to light gray, off white, occasional light brown, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, trace patchy oil stain, fast abundant white streaming cut, strong cream to white diffuse cut

14250-14300 SILTY SANDSTONE: medium to light gray, off white, occasional light brown, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, trace patchy oil stain, fast abundant white streaming cut, strong cream to white diffuse cut

14300-14350 SILTY SANDSTONE: medium to light gray, off white, occasional light brown, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, trace patchy oil stain, fast abundant white streaming cut, strong cream to white diffuse cut

14350-14400 SILTY SANDSTONE: medium to light gray, off white, occasional light brown, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, trace patchy oil stain, fast abundant white streaming cut, very strong white diffuse cut

14400-14450 SILTY SANDSTONE: medium to light gray, off white, occasional light brown, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, trace patchy oil stain, fast abundant white streaming cut, very strong white diffuse cut

14450-14500 SILTY SANDSTONE: medium to light gray, off white, occasional light brown, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, trace patchy oil stain, fast abundant white streaming cut, very strong white diffuse cut

14500-14550 SILTY SANDSTONE: medium to light gray, occasional light brown, trace off white, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, trace patchy oil stain, fast abundant white streaming cut, very strong white diffuse cut

14550-14600 SILTY SANDSTONE: medium to light gray, occasional light brown, trace off white, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, trace patchy oil stain, no streaming cut, weak white diffuse cut

14600-14650 SILTY SANDSTONE: medium to light gray, occasional light brown, trace off white, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, trace patchy oil stain, no streaming cut, weak white diffuse cut

14650-14700 SILTY SANDSTONE: medium to light gray, occasional light brown, trace off white, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, trace patchy oil stain, no streaming cut, weak white diffuse cut

14700-14750 SILTY SANDSTONE: medium to light gray, occasional light brown, trace off white, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, trace patchy oil stain, no streaming cut, weak white diffuse cut

14750-14800 SILTY SANDSTONE: medium to light gray, occasional light brown, trace off white, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, trace patchy oil stain, fast abundant white streaming cut, very strong white diffuse cut

14800-14850 SILTY SANDSTONE: medium to light gray, occasional light brown, trace off white, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, trace patchy oil stain, fast abundant white streaming cut, very strong white diffuse cut

14850-14900 SILTY SANDSTONE: medium to light gray, occasional light brown, trace off white, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, trace patchy oil stain, fast abundant white streaming cut, very strong white diffuse cut

14900-14950 SILTY SANDSTONE: medium to light gray, occasional light brown, trace off white, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, trace patchy oil stain, fast abundant white streaming cut, very strong white diffuse cut

14950-15000 SILTY SANDSTONE: medium to light gray, occasional light brown, trace off white, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, trace patchy oil stain, fast abundant white streaming cut, very strong white diffuse cut

15000-15050 SILTY SANDSTONE: medium to light gray, occasional light brown, trace off white, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, trace patchy oil stain, fast abundant white streaming cut, very strong white diffuse cut

15050-15100 SILTY SANDSTONE: medium to light gray, occasional light brown, trace off white, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, trace patchy oil stain, fast abundant white streaming cut, very strong white diffuse cut

15100-15150 SILTY SANDSTONE: medium to light gray, occasional light brown, trace off white, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, trace patchy oil stain, fast abundant white streaming cut, very strong white diffuse cut

15150-15200 SILTY SANDSTONE: medium to light gray, occasional light brown, trace off white, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, trace patchy oil stain, fast abundant white streaming cut, very strong white diffuse cut

15200-15250 SILTY SANDSTONE: medium to light gray, occasional light brown, trace off white, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, trace patchy oil stain, fast abundant white streaming cut, moderately cream to white diffuse cut

15250-15300 SILTY SANDSTONE: medium to light gray, occasional light brown, trace off white, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, trace patchy oil stain, fast abundant white streaming cut, moderately cream to white diffuse cut

15300-15350 SILTY SANDSTONE: medium to light gray, occasional light brown, trace off white, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, trace patchy oil stain, fast abundant white streaming cut, moderately cream to white diffuse cut

15350-15400 SILTY SANDSTONE: medium to light gray, occasional light brown, trace off white, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, trace patchy oil stain, fast abundant white streaming cut, moderately cream to white diffuse cut

15400-15450 SILTY SANDSTONE: medium to light gray, occasional light brown, trace off white, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, trace patchy oil stain, fast abundant white streaming cut, moderately cream to white diffuse cut

15450-15500 SILTY SANDSTONE: medium to light gray, occasional light brown, trace off white, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, trace patchy oil stain, fast abundant white streaming cut, moderately cream to white diffuse cut

15500-15550 SILTY SANDSTONE: medium to light gray, occasional light brown, trace off white, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, trace patchy oil stain, fast abundant white streaming cut, moderately cream to white diffuse cut

15550-15600 SILTY SANDSTONE: medium to light gray, occasional off white, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, trace patchy oil stain, fast abundant white streaming cut, moderately cream to white diffuse cut

15600-15650 SILTY SANDSTONE: medium to light gray, occasional off white, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, trace patchy oil stain, fast abundant white streaming cut, moderately white diffuse cut

15650-15700 SILTY SANDSTONE: medium to light gray, occasional off white, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, trace patchy oil stain, fast abundant white streaming cut, moderately white diffuse cut

15700-15750 SILTY SANDSTONE: medium to light gray, occasional off white, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, trace patchy oil stain, fast abundant white streaming cut, moderately white diffuse cut

15750-15800 SILTY SANDSTONE: medium to light gray, occasional off white, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, trace patchy oil stain, fast abundant white streaming cut, moderately white diffuse cut

15800-15850 SILTY SANDSTONE: medium to light gray, occasional off white, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, trace patchy oil stain, fast trace white streaming cut, weak white diffuse cut

15850-15900 SILTY SANDSTONE: medium to light gray, occasional off white, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, trace patchy oil stain, fast trace white streaming cut, weak white diffuse cut

15900-15950 SILTY SANDSTONE: medium to light gray, occasional off white, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, trace patchy oil stain, fast trace white streaming cut, weak white diffuse cut

15950-16000 SILTY SANDSTONE: medium to light gray, occasional off white, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, trace patchy oil stain, fast trace white streaming cut, weak white diffuse cut

16000-16050 SILTY SANDSTONE: medium to light gray, dark gray, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, trace patchy oil stain, no streaming cut, weak white diffuse cut

16050-16100 SILTY SANDSTONE: medium to light gray, dark gray, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, trace patchy oil stain, no streaming cut, weak white diffuse cut

16100-16150 SILTY SANDSTONE: medium to light gray, dark gray, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, trace patchy oil stain, no streaming cut, weak white diffuse cut

16150-16200 SILTY SANDSTONE: medium to light gray, dark gray, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, trace patchy oil stain, no streaming cut, weak white diffuse cut

16200-16250 SILTY SANDSTONE: medium to light gray, dark gray, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, trace patchy oil stain, no streaming cut, weak white diffuse cut

16250-16300 SILTY SANDSTONE: medium to light gray, dark gray, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, trace patchy oil stain, no streaming cut, weak white diffuse cut

16300-16350 SILTY SANDSTONE: medium to light gray, dark gray, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, trace patchy oil stain, no streaming cut, weak white diffuse cut

16350-16400 SILTY SANDSTONE: medium to light gray, dark gray, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, trace patchy oil stain, no streaming cut, weak white diffuse cut

16400-16450 SILTY SANDSTONE: medium to light gray, dark gray, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, trace patchy oil stain, no streaming cut, weak white diffuse cut

16450-16500 SILTY SANDSTONE: medium to dark gray, trace light gray, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, trace patchy oil stain, no streaming cut, weak white diffuse cut

16500-16550 SILTY SANDSTONE: medium to dark gray, trace light gray, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, trace patchy oil stain, no streaming cut, weak white diffuse cut

16550-16600 SILTY SANDSTONE: medium to dark gray, trace light gray, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, trace patchy oil stain, no streaming cut, weak white diffuse cut

16600-16650 SILTY SANDSTONE: medium to dark gray, trace light gray, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, trace patchy oil stain, no streaming cut, weak white diffuse cut

16650-16700 SILTY SANDSTONE: medium to light gray, dark gray, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, trace patchy oil stain, fast weak streaming cut, weak white diffuse cut

16700-16750 SILTY SANDSTONE: medium to light gray, dark gray, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, trace patchy oil stain, fast weak streaming cut, weak white diffuse cut

16750-16800 SILTY SANDSTONE: medium to light gray, dark gray, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, trace patchy oil stain, fast weak streaming cut, weak white diffuse cut

16800-16850 SILTY SANDSTONE: medium to light gray, dark gray, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, trace patchy oil stain, fast weak streaming cut, moderately white diffuse cut

16850-16900 SILTY SANDSTONE: medium to light gray, dark gray, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, trace patchy oil stain, fast weak streaming cut, moderately white diffuse cut

16900-16950 SILTY SANDSTONE: medium to light gray, dark gray, trace off white, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, trace patchy oil stain, fast weak streaming cut, moderately white diffuse cut

16950-17000 SILTY SANDSTONE: medium to light gray, off white, occasional dark gray, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, trace patchy oil stain, fast weak streaming cut, moderately white diffuse cut

17000-17050 SILTY SANDSTONE: medium to light gray, off white, occasional dark gray, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, trace patchy oil stain, fast weak streaming cut, moderately white diffuse cut

17050-17100 SILTY SANDSTONE: medium to light gray, off white, occasional dark gray, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, trace patchy oil stain, fast weak streaming cut, moderately white diffuse cut

17100-17150 SILTY SANDSTONE: medium to light gray, off white, occasional dark gray, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, trace patchy oil stain, fast weak streaming cut, moderately white diffuse cut

17150-17200 SILTY SANDSTONE: medium to light gray, off white, occasional dark gray, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, trace patchy oil stain, fast weak streaming cut, moderately white diffuse cut

17200-17250 SILTY SANDSTONE: medium to light gray, off white, occasional dark gray, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, trace patchy oil stain, fast weak streaming cut, moderately white diffuse cut

17250-17300 SILTY SANDSTONE: medium to light gray, off white, occasional dark gray, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, trace patchy oil stain, fast weak streaming cut, moderately white diffuse cut

17300-17350 SILTY SANDSTONE: medium to light gray, off white, occasional dark gray, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, trace patchy oil stain, strong abundant streaming cut, moderately white diffuse cut

17350-17400 SILTY SANDSTONE: medium to light gray, off white, occasional dark gray, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, trace patchy oil stain, strong abundant streaming cut, moderately white diffuse cut

17400-17450 SILTY SANDSTONE: medium to light gray, off white, occasional dark gray, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, trace patchy oil stain, strong abundant streaming cut, moderately white diffuse cut

17450-17500 SILTY SANDSTONE: medium to light gray, off white, occasional dark gray, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, trace patchy oil stain, strong abundant streaming cut, moderately white diffuse cut

17500-17550 SILTY SANDSTONE: medium to light gray, off white, occasional dark gray, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, trace patchy oil stain, strong abundant streaming cut, moderately white diffuse cut

17550-17600 SILTY SANDSTONE: medium to light gray, off white, occasional dark gray, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, trace patchy oil stain, strong abundant streaming cut, moderately white diffuse cut

17600-17650 SILTY SANDSTONE: medium to light gray, off white, occasional dark gray, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, trace patchy oil stain, strong abundant streaming cut, moderately white diffuse cut

17650-17700 SILTY SANDSTONE: medium to light gray, off white, occasional dark gray, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, trace patchy oil stain, strong abundant streaming cut, moderately white diffuse cut

17700-17750 SILTY SANDSTONE: light to medium gray, off white, occasional dark gray, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, trace patchy oil stain, no visible streaming cut, slight strong white diffuse cut

17750-17800 SILTY SANDSTONE: light to medium gray, off white, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, trace patchy oil stain, no visible streaming cut, slight strong white diffuse cut

17800-17850 SILTY SANDSTONE: light to medium gray, off white, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, trace patchy oil stain, no visible streaming cut, slight strong white diffuse cut

17850-17900 SILTY SANDSTONE: light to medium gray, off white, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, trace patchy oil stain, no visible streaming cut, slight strong white diffuse cut

17900-17950 SILTY SANDSTONE: light to medium gray, off white, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, trace patchy oil stain, no visible streaming cut, slight strong white diffuse cut

17950-18000 SILTY SANDSTONE: light to medium gray, off white, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, trace patchy oil stain, no visible streaming cut, slight strong white diffuse cut

18000-18050 SILTY SANDSTONE: light to medium gray, off white, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, trace patchy oil stain, no visible streaming cut, slight strong white diffuse cut

18050-18100 SILTY SANDSTONE: light to medium gray, off white, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, trace patchy oil stain, no visible streaming cut, slight strong white diffuse cut

18100-18150 SILTY SANDSTONE: light to medium gray, off white, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, trace patchy oil stain, strong abundant streaming cut, moderately white diffuse cut

18150-18200 SILTY SANDSTONE: light to medium gray, off white, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, trace patchy oil stain, strong abundant streaming cut, moderately white diffuse cut

18200-18250 SILTY SANDSTONE: light to medium gray, off white, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, trace patchy oil stain, strong abundant streaming cut, moderately white diffuse cut

18250-18300 SILTY SANDSTONE: light to medium gray, off white, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, trace patchy oil stain, strong abundant streaming cut, moderately white diffuse cut

18300-18350 SILTY SANDSTONE: light to medium gray, off white, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, trace patchy oil stain, strong abundant streaming cut, moderately white diffuse cut

18350-18400 SILTY SANDSTONE: light to medium gray, off white, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, trace patchy oil stain, strong abundant streaming cut, moderately white diffuse cut

18400-18450 SILTY SANDSTONE: light to medium gray, off white, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, trace patchy oil stain, strong abundant streaming cut, moderately white diffuse cut

18450-18500 SILTY SANDSTONE: light to medium gray, off white, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, trace patchy oil stain, strong abundant streaming cut, moderately white diffuse cut

18500-18550 SILTY SANDSTONE: light to medium gray, off white, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, trace patchy oil stain, no visible streaming cut, moderately white diffuse cut

18550-18600 SILTY SANDSTONE: light to medium gray, off white, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, trace patchy oil stain, no visible streaming cut, moderately white diffuse cut

18600-18650 SILTY SANDSTONE: light to medium gray, off white, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, trace patchy oil stain, no visible streaming cut, moderately white diffuse cut

18650-18700 SILTY SANDSTONE: light to medium gray, off white, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, trace patchy oil stain, abundant moderate streaming cut, moderately white diffuse cut

18700-18750 SILTY SANDSTONE: light to medium gray, off white, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, trace patchy oil stain, abundant moderate streaming cut, moderately white diffuse cut

18750-18800 SILTY SANDSTONE: light to medium gray, off white, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, trace patchy oil stain, abundant moderate streaming cut, moderately white diffuse cut

18800-18850 SILTY SANDSTONE: light to medium gray, off white, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, trace patchy oil stain, abundant moderate streaming cut, moderately white diffuse cut

18850-18900 SILTY SANDSTONE: light to medium gray, off white, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, trace patchy oil stain, strong abundant streaming cut, moderately white diffuse cut

18900-18950 SILTY SANDSTONE: light to medium gray, off white, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, trace patchy oil stain, strong abundant streaming cut, moderately white diffuse cut

18950-19000 SILTY SANDSTONE: light to medium gray, off white, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, trace patchy oil stain, strong abundant streaming cut, moderately white diffuse cut

19000-19050 SILTY SANDSTONE: light to medium gray, off white, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, trace patchy oil stain, strong abundant streaming cut, moderately white diffuse cut

19050-19100 SILTY SANDSTONE: light to medium gray, off white, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, trace patchy oil stain, strong abundant streaming cut, moderately white diffuse cut

19100-19150 SILTY SANDSTONE: light to medium gray, off white, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, trace patchy oil stain, strong abundant streaming cut, moderately white diffuse cut

19150-19200 SILTY SANDSTONE: light to medium gray, off white, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, trace patchy oil stain, strong abundant streaming cut, moderately white diffuse cut

19200-19250 SILTY SANDSTONE: light to medium gray, off white, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, trace patchy oil stain, strong abundant streaming cut, moderately white diffuse cut

19250-19300 SILTY SANDSTONE: light to medium gray, off white, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, trace patchy oil stain, strong abundant streaming cut, moderately white diffuse cut

19300-19350 SILTY SANDSTONE: light to medium gray, off white, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, trace patchy oil stain, abundant moderate streaming cut, moderately white diffuse cut

19350-19400 SILTY SANDSTONE: light to medium gray, off white, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, trace patchy oil stain, abundant moderate streaming cut, moderately white diffuse cut

19400-19450 SILTY SANDSTONE: light to medium gray, off white, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, trace patchy oil stain, abundant moderate streaming cut, moderately white diffuse cut

19450-19500 SILTY SANDSTONE: light to medium gray, off white, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, trace patchy oil stain, abundant moderate streaming cut, moderately white diffuse cut

19500-19550 SILTY SANDSTONE: light to medium gray, white to off white, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, trace patchy oil stain, abundant moderate streaming cut, moderately white diffuse cut

19550-19600 SILTY SANDSTONE: light to medium gray, white to off white, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, trace patchy oil stain, abundant moderate streaming cut, moderately white diffuse cut

19600-19650 SILTY SANDSTONE: light to medium gray, white to off white, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, trace patchy oil stain, abundant moderate streaming cut, moderately white diffuse cut

19650-19700 SILTY SANDSTONE: light to medium gray, white to off white, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, trace patchy oil stain, abundant moderate streaming cut, moderately white diffuse cut

19700-19750 SILTY SANDSTONE: light to medium gray, white to off white, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, trace patchy oil stain, abundant moderate streaming cut, moderately white diffuse cut

19750-19800 SILTY SANDSTONE: light to medium gray, white to off white, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, trace patchy oil stain, abundant moderate streaming cut, moderately white diffuse cut

19800-19850 SILTY SANDSTONE: light to medium gray, white to off white, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, trace patchy oil stain, abundant moderate streaming cut, moderately white diffuse cut

19850-19900 SILTY SANDSTONE: light to medium gray, white to off white, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, trace patchy oil stain, strong abundant streaming cut, moderately white diffuse cut

19900-19950 SILTY SANDSTONE: light to medium gray, white to off white, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, trace patchy oil stain, strong abundant streaming cut, moderately white diffuse cut

19950-20000 SILTY SANDSTONE: light to medium gray, white to off white, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, trace patchy oil stain, strong abundant streaming cut, moderately white diffuse cut

20000-20050 SILTY SANDSTONE: light to medium gray, white to off white, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, trace patchy oil stain, strong abundant streaming cut, moderately white diffuse cut

20050-20100 SILTY SANDSTONE: light to medium gray, white to off white, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, trace patchy oil stain, abundant moderate streaming cut, moderately white diffuse cut

20100-20150 SILTY SANDSTONE: light to medium gray, white to off white, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, trace patchy oil stain, abundant moderate streaming cut, moderately white diffuse cut

20150-20200 SILTY SANDSTONE: light to medium gray, white to off white, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, trace patchy oil stain, abundant moderate streaming cut, moderately white diffuse cut

20200-20250 SILTY SANDSTONE: light to medium gray, white to off white, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, trace patchy oil stain, abundant moderate streaming cut, moderately white diffuse cut

20250-20300 SILTY SANDSTONE: light to medium gray, white to off white, very fine grained, sub angular, firm to friable, moderately sorted, calcareous cement, occasional nodular and disseminated pyrite, trace intergranular porosity, possible fracture porosity, trace patchy oil stain, abundant moderate streaming cut, moderately white diffuse cut

20,300' TD reached @ 03:00 hrs CST, 20 October 2011

ELECTRIC LOG REPORT

GING COMPANY:	Schlumberger	DRILLER'S TD DEPTH:	9,948'
ENGINEERS:	M. Arnett	DRILLER'S CASING DEPTH:	1,915'
WITNESSED BY:	Richard Ceynar	LOGGER'S TD DEPTH:	9,966'
DATE:	9 Oct 2011	LOGGER'S CASING DEPTH:	1,917'

ELEVATION:	GL:	1,904'	MUD CONDITIONS:	Wt: 9.7 lbm/gal
	KB:	1,929'	Oil Based Mud	Vis: 51 s
HOLE CONDITION:		Run #1: Pulled well	TECHNICAL PROBLEMS:	No problems.

Logging Time:

Time arrived:	13:30 Hrs 9 October 2011	Job ended:	21:20 Hrs on 9 October 2011
Job started:	17:00 Hrs 9 October 2011	Time Departed:	22:20 Hrs on 9 October 2011

Electric Logging Program:

Array Induction Log with gamma

Interval logged = 1,917' - 9,966'
Grain density = 2.71 g/cc
Resistivity scale scale = .20 to 2000 Ohms

Compensated neutron log 3 detector density with gamma

Interval logged = 4,685' - 9,966'
Grain density = 2.71 g/cc
Porosity scale =.3 to -0.1

Formation Tops

	TVD	Sub Sea
Greenhorn	4,380'	-2,451'
Mowry	4,800'	-2,871'
Dakota	5,195'	-3,266'
Rierdon	6,155'	-4,226'
Dunham Salt	6,652'	-4,723'
Dunham Salt Base	6,762'	-4,833'
Spearfish	6,804'	-4,875'
Pine Salt	7,110'	-5,181'
Pine Salt Base	7,152'	-5,223'
Opeche Salt	7,170'	-5,241'
Opeche Salt Base	7,243'	-5,314'
Broom Creek	7,381'	-5,452'
Otter	7,818'	-5,889'
Kibby Lime	8,225'	-6,296'
Charles Salt	8,376'	-6,447'
Base Charles Salt	9,043'	-7,114'
Mission Canyon	9,281'	-7,352'
Lodgepole	9,839'	-7,910'

COMMENTS:

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
NOV 2011
ND OIL & GAS DIVISION

Well File No.
20407

TH

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

- [x] Notice of Intent — Approximate Start Date: **November 8, 2011**
- [ ] Report of Work Done — Date Work Completed:
- [ ] Notice of Intent to Begin a Workover Project that may Qualify for a Tax Exemption Pursuant to NDCC Section 57-51.1-03. — Approximate Start Date:

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

Well Name and Number: **Chalmers 5300 31-19H**

Footages	Qtr-Qtr	Section	Township	Range
1535 F S L 375 F W L	**LOT3**	**19**	**153 N**	**100 W**

Field	Pool	County
Wildcat	**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.

Exds 05/14/2012

Company	Telephone Number
Oasis Petroleum North America LLC	**281-404-9491**

Address: **1001 Fannin, Suite 1500**

City	State	Zip Code
Houston	**TX**	**77002**

Signature: Brandi Terry
Printed Name: **Brandi Terry**
Title: **Regulatory Specialist**
Date: **November 8, 2011**
Email Address: **bterry@oasispetroleum.com**

FOR STATE USE ONLY

- [ ] Received
- [x] Approved

Date: 11-14-2011
By: David Tabor
Title: **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
NOV 2011
NO OIL & GAS DIVISION

Well File No.
20407

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- [ ] Drilling Prognosis
- [ ] Redrilling or Repair
- [ ] Casing or Liner
- [ ] Plug Well
- [ ] Supplemental History
- [ ] Temporarily Abandon
- [ ] Other **Waiver from tubing/packer requirement**
- [ ] Spill Report
- [ ] Shooting
- [ ] Acidizing
- [ ] Fracture Treatment
- [ ] Change Production Method
- [ ] Reclamation

Well Name and Number: **Chalmers 5300 31-19H**

Footages	Qtr-Qtr	Section	Township	Range
1535 F S L 375 F W L	LOT3	19	153 N	100 W

Field	Pool	County
Wildcat	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 waiver from the tubing/pkr requirement included in NDAC 43-02-03-21: 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# & 32# casing at surface with an API burst rating of 11,220 psi**
2. **The frac design will use 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 monitoring equipment.**
4. **The casing is exposed to significantly lower rates and pressures during flow back 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	281-404-9491

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

Signature	Printed Name
Brandi Terry	Brandi Terry
Title: Regulatory Specialist	Date: November 8, 2011

Email Address: bterry@oasispetroleum.com

FOR STATE USE ONLY

- [ ] Received
- [x] Approved

Date: November 9, 2011
By: David S. Middleton
Title: PETROLEUM ENGINEER

SUNDRY NOTICES AND REPORTS ON WELLS - FORM 4

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

NOV 2011
RECEIVED
ND OIL & GAS
DIVISION

Well File No.
20407

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

- [x] Notice of Intent — Approximate Start Date: **November 9, 2011**
- [ ] Report of Work Done — Date Work Completed:
- [ ] Notice of Intent to Begin a Workover Project that may Qualify for a Tax Exemption Pursuant to NDCC Section 57-51.1-03. — Approximate Start Date:

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

Well Name and Number					
Chalmers 5300 31-19H					
Footages		Qtr-Qtr	Section	Township	Range
1535 F **S** L	**375** F **W** L	**LOT3**	**19**	**153 N**	**100 W**
Field	Pool	County			
Wildcat	**Bakken**	**McKenzie**			

24-HOUR PRODUCTION RATE

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

Name of Contractor(s)			
Excel Industries, Inc.			
Address	City	State	Zip Code
P.Box 159	**Miles City**	**MT**	**59301**

DETAILS OF WORK

Oasis Petroleum North America LLC plans to reclaim the reserve pit for the above referenced well as follows:

NDIC field inspector, Mark Binns and the landowner were notified on 11/1/2011
Landowner: Wesley G and Barbara J Lindvig, 14075 41st Street NW, Williston, ND 58801
Fluids will be hauled to the Oasis Petroleum, Belle SWD 5503 43-1 (NDIC 90147)
Cuttings will be mixed with clay to solidify. Slope and contour wellsite to ensure proper drainage.

Company		Telephone Number
Oasis Petroleum North America LLC		**281-404-9491**
Address		
1001 Fannin, Suite 1500		
City	State	Zip Code
Houston	**TX**	**77002**
Signature	Printed Name	
Brandi Terry (signature)	**Brandi Terry**	
Title	Date	
Regulatory Specialist	**November 1, 2011**	
Email Address		
bterry@oasispetroleum.com		

FOR STATE USE ONLY

[ ] Received	[x] Approved
Date	11-2-11
By	[signature]
Title	[illegible]

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

Wednesday, October 26, 2011

State of North Dakota

Subject: **Surveys**

Re: **Oasis**
Chamlers 5300 31-91H
Williams, ND

Enclosed, please find the original and one copy of the survey performed on the above-referenced well by Ryan Energy Technologies U.S.A., Inc. (Operator No. 740022). 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 Survey*	*TD Straight Line Projection*
Pitre, Jace	MWD Operator	O.H.	1915'	13184'	10/05/11	10/15/11	MWD	13267'
Pitre, Jace	MWD Operator	ST 1	13001'	20249'	10/15/11	10/20/11	MWD	20300'

A certified plat on which the bottom hole location is oriented both to the surface location and to the lease lines (or unit lines in case of pooling) is attached to the survey report. If any other information is required please contact the undersigned at the letterhead address or phone number.

Douglas Hudson

Douglas Hudson
Well Planner

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

Wednesday, October 26, 2011

State of North Dakota

Subject: **Survey Certification Letter**

Re: **Oasis**
Chamlers 5300 31-91H
Williams, ND

I, Jace Pitre, certify that; I am employed by Ryan Energy Technologies U.S.A., Inc.; that I did on the conduct or supervise the taking of the following MWD surveys:

on the day(s) of 10/5/2011 thru 10/15/2011 from a depth of 1915' MD to a depth of 13184' MD and Straight line projection to TD 13267' MD;
on the day(s) of 10/15/2011 thru 10/20/2011 from a depth of 13001' MD to a depth of 20249' MD and Straight line projection to TD 20300' MD;

that the data is true, correct, complete, and within the limitations of the tool as set forth by Ryan Energy Technologies U.S.A., Inc.; that I am authorized and qualified to make this report; that this survey was conducted at the request of Oasis for the Chamlers 5300 31-91H; in Williams, ND.

Jace Pitre

Jace Pitre
MWD Operator
Ryan Energy Technologies U.S.A., Inc.

Report #: 1
Date: 4-Oct-11

Ryan Drilling Technologies & Solutions

Ryan Job # 5098
Kit # 27

SURVEY REPORT

Customer: Oasis/Rpm
Well Name: Chalmers 5300-31-19 H
Block or Section:
Rig #: Nabors 149
Calculation Method: Minimun Curvature Calculation

MWD Operator: Jace Pitre/Nick Brochu
Directional Drillers: Jordan Jensen
Survey Corrected To: True North
Vertical Section Direction: 90
Survey Correction: 8.81
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	**1915**	**0.00**	**0.00**	**0.00**	**1915.00**	**0.00**	**0.00**	**0.00**	**0.00**
1	1987	0.50	17.70	75.00	1987.00	0.10	0.30	0.10	0.69
2	2082	0.50	284.00	78.00	2082.00	-0.18	0.79	-0.18	0.77
3	2177	0.60	296.50	80.00	2176.99	-1.03	1.12	-1.03	0.16
4	2273	0.90	284.10	82.00	2272.98	-2.21	1.52	-2.21	0.35
5	**2368**	**0.90**	**277.00**	**84.00**	**2367.97**	**-3.67**	**1.80**	**-3.67**	**0.12**
6	2463	1.10	272.10	86.00	2462.96	-5.33	1.92	-5.33	0.23
7	2559	1.40	269.10	89.00	2558.93	-7.42	1.94	-7.42	0.32
8	2654	2.10	266.70	91.00	2653.89	-10.32	1.82	-10.32	0.74
9	2749	0.90	258.20	93.00	2748.86	-12.78	1.57	-12.78	1.28
10	**2845**	**1.00**	**251.30**	**96.00**	**2844.84**	**-14.32**	**1.14**	**-14.32**	**0.16**
11	2941	1.00	244.70	98.00	2940.83	-15.87	0.52	-15.87	0.12
12	3036	1.60	234.90	102.00	3035.80	-17.70	-0.60	-17.70	0.67
13	3131	1.20	236.40	103.00	3130.77	-19.62	-1.91	-19.62	0.42
14	3227	0.80	209.10	105.00	3226.76	-20.78	-3.06	-20.78	0.64
15	**3322**	**0.70**	**247.40**	**109.00**	**3321.75**	**-21.64**	**-3.86**	**-21.64**	**0.53**
16	3418	0.70	261.60	109.00	3417.75	-22.76	-4.17	-22.76	0.18
17	3513	1.00	273.60	111.00	3512.74	-24.16	-4.20	-24.16	0.37
18	3609	1.00	274.20	113.00	3608.72	-25.83	-4.09	-25.83	0.01
19	3704	1.00	256.90	115.00	3703.71	-27.47	-4.21	-27.47	0.32
20	**3800**	**0.60**	**232.70**	**116.00**	**3799.70**	**-28.68**	**-4.71**	**-28.68**	**0.54**
21	3895	0.60	228.40	118.00	3894.69	-29.45	-5.34	-29.45	0.05
22	3991	0.90	253.10	120.00	3990.68	-30.55	-5.89	-30.55	0.45
23	4086	0.70	226.10	122.00	4085.67	-31.68	-6.51	-31.68	0.44
24	4181	0.40	238.60	118.00	4180.67	-32.38	-7.09	-32.38	0.34
25	**4277**	**0.40**	**238.40**	**118.00**	**4276.67**	**-32.95**	**-7.44**	**-32.95**	**0.00**
26	4373	0.60	253.40	118.00	4372.66	-33.72	-7.76	-33.72	0.25
27	4468	0.90	236.00	120.00	4467.66	-34.81	-8.32	-34.81	0.39
28	4563	0.40	245.90	120.00	4562.65	-35.73	-8.87	-35.73	0.54
29	4659	0.90	251.00	122.00	4658.64	-36.75	-9.25	-36.75	0.52
30	**4754**	**0.80**	**287.50**	**122.00**	**4753.63**	**-38.09**	**-9.30**	**-38.09**	**0.57**
31	4850	0.80	263.30	125.00	4849.62	-39.40	-9.17	-39.40	0.35
32	4942	1.00	236.40	125.00	4941.61	-40.70	-9.69	-40.70	0.50
33	5038	1.20	215.20	129.00	5037.60	-41.98	-10.98	-41.98	0.47
34	5133	0.60	246.70	129.00	5132.58	-43.01	-11.99	-43.01	0.80
35	**5228**	**1.00**	**215.40**	**132.00**	**5227.58**	**-43.95**	**-12.86**	**-43.95**	**0.61**
36	5324	0.90	208.90	134.00	5323.56	-44.80	-14.20	-44.80	0.15
37	5419	1.10	207.60	134.00	5418.55	-45.58	-15.66	-45.58	0.21
38	5515	1.30	210.90	136.00	5514.53	-46.57	-17.41	-46.57	0.22
39	5610	1.20	185.10	138.00	5609.50	-47.21	-19.33	-47.21	0.60
40	**5705**	**1.10**	**188.00**	**140.00**	**5704.49**	**-47.42**	**-21.22**	**-47.42**	**0.12**
41	5801	1.50	202.00	140.00	5800.46	-48.02	-23.30	-48.02	0.53
42	5896	0.70	212.20	141.00	5895.44	-48.80	-24.94	-48.80	0.86
43	5992	0.40	166.40	120.00	5991.44	-49.03	-25.77	-49.03	0.53
44	6087	0.30	209.20	143.00	6086.44	-49.07	-26.31	-49.07	0.29
45	**6182**	**0.10**	**82.20**	**152.00**	**6181.44**	**-49.11**	**-26.51**	**-49.11**	**0.39**
46	6277	0.80	258.20	147.00	6276.43	-49.68	-26.64	-49.68	0.95
47	6372	0.80	200.90	147.00	6371.43	-50.57	-27.39	-50.57	0.81
48	6468	1.50	214.10	149.00	6467.41	-51.51	-29.06	-51.51	0.77
49	6563	1.30	218.60	149.00	6562.38	-52.88	-30.93	-52.88	0.24
50	**6658**	**1.10**	**190.80**	**149.00**	**6657.36**	**-53.72**	**-32.67**	**-53.72**	**0.64**
51	6754	1.30	190.90	152.00	6753.34	-54.10	-34.64	-54.10	0.21
52	6849	1.50	207.40	150.00	6848.31	-54.88	-36.80	-54.88	0.47
53	6945	1.80	196.30	154.00	6944.27	-55.88	-39.37	-55.88	0.46
54	7040	1.80	190.70	154.00	7039.22	-56.57	-42.27	-56.57	0.19
55	**7135**	**1.40**	**188.20**	**156.00**	**7134.19**	**-57.02**	**-44.88**	**-57.02**	**0.43**
56	7231	1.80	186.80	158.00	7230.15	-57.36	-47.54	-57.36	0.42
57	7326	1.60	187.50	159.00	7325.11	-57.71	-50.33	-57.71	0.21
58	7422	1.80	207.40	161.00	7421.06	-58.58	-53.00	-58.58	0.65
59	7517	1.70	202.40	163.00	7516.02	-59.80	-55.63	-59.80	0.19
60	**7613**	**1.00**	**225.60**	**163.00**	**7611.99**	**-60.95**	**-57.53**	**-60.95**	**0.91**
61	7708	0.80	195.20	163.00	7706.98	-61.71	-58.75	-61.71	0.54
62	7804	0.60	235.00	165.00	7802.98	-62.30	-59.69	-62.30	0.53
63	7899	0.90	210.00	165.00	7897.97	-63.08	-60.62	-63.08	0.46
64	7994	0.60	255.80	167.00	7992.96	-63.94	-61.39	-63.94	0.68
65	**8090**	**1.00**	**241.30**	**168.00**	**8088.95**	**-65.16**	**-61.91**	**-65.16**	**0.46**

Report #: 1
Date: 4-Oct-11

Ryan Drilling Technologies & Solutions

Ryan Job # 5098
Kit # 27

SURVEY REPORT

Customer: Oasis/Rpm
Well Name: Chalmers 5300-31-19 H
Block or Section:
Rig #: Nabors 149
Calculation Method: Minimun Curvature Calculation

MWD Operator: Jace Pitre/Nick Brochu
Directional Drillers: Jordan Jensen
Survey Corrected To: True North
Vertical Section Direction: 90
Survey Correction: 8.81
Temperature Forecasting Model (Chart Only): Logarithmic

Survey #	MD	Inc	Azm	Temp	TVD	VS	N/S	E/W	DLS
66	8185	0.90	251.70	168.00	8183.94	-66.59	-62.54	-66.59	0.21
67	8281	0.80	256.30	168.00	8279.93	-67.96	-62.94	-67.96	0.13
68	8376	0.50	237.20	170.00	8374.92	-68.95	-63.32	-68.95	0.39
69	8471	0.70	243.00	172.00	8469.92	-69.82	-63.81	-69.82	0.22
70	**8567**	**0.80**	**244.60**	**167.00**	**8565.91**	**-70.95**	**-64.36**	**-70.95**	**0.11**
71	8662	0.90	249.30	167.00	8660.90	-72.24	-64.91	-72.24	0.13
72	8758	0.50	274.10	165.00	8756.89	-73.37	-65.15	-73.37	0.51
73	8853	0.50	242.20	167.00	8851.89	-74.15	-65.31	-74.15	0.29
74	8948	0.80	240.60	176.00	8946.88	-75.09	-65.83	-75.09	0.32
75	**9044**	**0.60**	**276.40**	**172.00**	**9042.87**	**-76.17**	**-66.10**	**-76.17**	**0.49**
76	9139	0.70	281.00	174.00	9137.87	-77.24	-65.94	-77.24	0.12
77	9232	0.70	239.60	176.00	9230.86	-78.29	-66.12	-78.29	0.53
78	9327	0.70	275.40	177.00	9325.85	-79.36	-66.36	-79.36	0.45
79	9423	1.00	261.40	179.00	9421.84	-80.78	-66.43	-80.78	0.38
80	**9518**	**0.70**	**263.80**	**183.00**	**9516.83**	**-82.17**	**-66.61**	**-82.17**	**0.32**
81	9613	0.70	239.60	183.00	9611.83	-83.25	-66.97	-83.25	0.31
82	9709	0.90	261.50	179.00	9707.82	-84.50	-67.38	-84.50	0.38
83	9804	1.10	227.90	183.00	9802.80	-85.92	-68.10	-85.92	0.64
84	9891	1.10	241.30	183.00	9889.79	-87.27	-69.06	-87.27	0.30
85	**9990**	**0.90**	**244.70**	**172.00**	**9988.77**	**-88.80**	**-69.85**	**-88.80**	**0.21**
86	10027	1.00	241.70	176.00	10025.77	-89.35	-70.12	-89.35	0.30
87	10059	1.00	252.50	176.00	10057.76	-89.86	-70.34	-89.86	0.59
88	10091	0.10	331.50	177.00	10089.76	-90.14	-70.40	-90.14	3.08
89	10123	3.90	87.80	177.00	10121.74	-89.07	-70.33	-89.07	12.33
90	**10154**	**7.40**	**88.40**	**177.00**	**10152.58**	**-86.02**	**-70.24**	**-86.02**	**11.29**
91	10186	10.60	88.50	176.00	10184.18	-81.02	-70.10	-81.02	10.00
92	10218	14.20	91.20	177.00	10215.43	-74.15	-70.11	-74.15	11.39
93	10250	18.10	90.60	179.00	10246.16	-65.25	-70.24	-65.25	12.20
94	10280	22.00	95.50	183.00	10274.34	-54.99	-70.83	-54.99	14.14
95	**10312**	**25.80**	**96.70**	**183.00**	**10303.59**	**-42.10**	**-72.22**	**-42.10**	**11.97**
96	10344	29.90	97.10	181.00	10331.88	-27.27	-74.02	-27.27	12.83
97	10376	34.10	96.20	183.00	10359.01	-10.43	-75.97	-10.43	13.21
98	10408	38.20	96.80	183.00	10384.84	8.32	-78.11	8.32	12.86
99	10439	42.30	94.70	183.00	10408.50	28.25	-80.10	28.25	13.93
100	**10471**	**45.50**	**92.20**	**183.00**	**10431.56**	**50.39**	**-81.43**	**50.39**	**11.37**
101	10503	48.50	88.50	183.00	10453.38	73.78	-81.55	73.78	12.62
102	10535	52.70	87.20	183.00	10473.69	98.49	-80.61	98.49	13.49
103	10566	56.90	88.30	186.00	10491.56	123.79	-79.63	123.79	13.85
104	10598	61.10	89.50	186.00	10508.03	151.21	-79.11	151.21	13.51
105	**10630**	**63.50**	**88.20**	**188.00**	**10522.91**	**179.53**	**-78.53**	**179.53**	**8.32**
106	10662	65.50	89.00	188.00	10536.68	208.41	-77.83	208.41	6.64
107	10694	66.60	90.50	188.00	10549.67	237.65	-77.70	237.65	5.49
108	10725	68.10	90.60	188.00	10561.61	266.26	-77.98	266.26	4.85
109	10757	72.60	89.50	190.00	10572.37	296.38	-78.00	296.38	14.43
110	**10789**	**78.00**	**89.90**	**190.00**	**10580.49**	**327.33**	**-77.84**	**327.33**	**16.92**
111	10821	83.50	88.90	192.00	10585.63	358.89	-77.51	358.89	17.46
112	10840	85.50	89.00	194.00	10587.45	377.80	-77.16	377.80	10.54
113	10902	86.90	88.50	226.00	10591.56	439.65	-75.81	439.65	2.40
114	10934	86.80	88.00	221.00	10593.32	471.59	-74.84	471.59	1.59
115	**11029**	**89.50**	**89.90**	**221.00**	**10596.39**	**566.51**	**-73.10**	**566.51**	**3.47**
116	11124	89.40	90.70	224.00	10597.30	661.50	-73.59	661.50	0.85
117	11220	89.50	90.60	226.00	10598.22	757.49	-74.68	757.49	0.15
118	11315	88.30	90.80	228.00	10600.04	852.46	-75.84	852.46	1.28
119	11412	88.50	90.10	226.00	10602.75	949.42	-76.61	949.42	0.75
120	**11508**	**89.00**	**88.80**	**228.00**	**10604.85**	**1045.39**	**-75.68**	**1045.39**	**1.45**
121	11604	88.80	88.30	230.00	10606.69	1141.34	-73.25	1141.34	0.56
122	11698	89.80	88.20	228.00	10607.84	1235.29	-70.38	1235.29	1.07
123	11793	89.90	88.00	231.00	10608.09	1330.24	-67.23	1330.24	0.24
124	11888	89.80	86.80	233.00	10608.33	1425.14	-62.93	1425.14	1.27
125	**11985**	**89.50**	**87.70**	**231.00**	**10608.93**	**1522.03**	**-58.27**	**1522.03**	**0.98**
126	12080	87.90	89.80	233.00	10611.08	1616.97	-56.20	1616.97	2.78
127	12175	89.70	90.70	233.00	10613.07	1711.94	-56.61	1711.94	2.12
128	12268	89.40	90.30	237.00	10613.80	1804.94	-57.43	1804.94	0.54
129	12359	89.40	89.60	239.00	10614.75	1895.93	-57.35	1895.93	0.77
130	**12451**	**89.90**	**90.30**	**237.00**	**10615.32**	**1987.93**	**-57.27**	**1987.93**	**0.94**

Report #: 1
Date: 4-Oct-11

Ryan Drilling Technologies & Solutions

Ryan Job # 5098
Kit # 27

SURVEY REPORT

Customer: Oasis/Rpm
Well Name: Chalmers 5300-31-19 H
Block or Section:
Rig #: Nabors 149
Calculation Method: Minimun Curvature Calculation

MWD Operator: Jace Pitre/Nick Brochu
Directional Drillers: Jordan Jensen
Survey Corrected To: True North
Vertical Section Direction: 90
Survey Correction: 8.81
Temperature Forecasting Model (Chart Only): Logarithmic

Survey #	MD	Inc	Azm	Temp	TVD	VS	N/S	E/W	DLS
131	12543	89.80	90.20	239.00	10615.56	2079.93	-57.67	2079.93	0.15
132	12634	89.00	89.50	239.00	10616.51	2170.92	-57.43	2170.92	1.17
133	12725	90.60	90.00	240.00	10616.83	2261.92	-57.03	2261.92	1.84
134	12817	89.10	89.40	242.00	10617.07	2353.91	-56.55	2353.91	1.76
135	**12909**	**89.30**	**89.40**	**240.00**	**10618.35**	**2445.90**	**-55.59**	**2445.90**	**0.22**
136	13001	89.50	90.60	242.00	10619.32	2537.89	-55.59	2537.89	1.32
137	13092	93.40	92.00	242.00	10617.01	2628.82	-57.65	2628.82	4.55
138	13184	92.80	92.50	242.00	10612.04	2720.61	-61.26	2720.61	0.85
Projection	13267	92.80	92.50	242.00	10607.98	2803.43	-64.87	2803.43	0.00

Report #: 2
Date: 4-Oct-11

Ryan Drilling Technologies & Solutions

Ryan Job # 5098
Kit # 27

SURVEY REPORT

Customer: Oasis/Rpm
Well Name: Chalmers 5300-31-19 H
Block or Section: Sidetrack #1
Rig #: Nabors 149
Calculation Method: Minimun Curvature Calculation

MWD Operator: Jace Pitre/ Nick Brochu
Directional Drillers: Jordan Jensen
Survey Corrected To: True North
Vertical Section Direction: 90
Survey Correction: 8.81
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	**13001**	**89.50**	**90.60**	**242.00**	**10619.35**	**2537.73**	**-55.62**	**2537.73**	**1.32**
1	13062	89.80	91.30	242.00	10619.72	2598.72	-56.63	2598.72	1.25
2	13092	88.00	91.10	240.00	10620.30	2628.71	-57.26	2628.71	6.04
3	13123	88.00	90.80	237.00	10621.38	2659.68	-57.77	2659.68	0.97
4	13153	87.90	91.30	239.00	10622.45	2689.66	-58.32	2689.66	1.70
5	**13184**	**88.10**	**90.90**	**240.00**	**10623.54**	**2720.63**	**-58.92**	**2720.63**	**1.44**
6	13275	88.30	90.90	242.00	10626.39	2811.58	-60.35	2811.58	0.22
7	13367	90.50	91.80	244.00	10627.36	2903.54	-62.51	2903.54	2.58
8	13459	88.20	92.20	244.00	10628.40	2995.47	-65.72	2995.47	2.54
9	13550	88.90	92.70	246.00	10630.70	3086.36	-69.61	3086.36	0.95
10	**13581**	**89.60**	**93.20**	**246.00**	**10631.11**	**3117.32**	**-71.21**	**3117.32**	**2.77**
11	13642	89.00	93.20	244.00	10631.85	3178.22	-74.61	3178.22	0.98
12	13733	89.00	93.50	248.00	10633.44	3269.05	-79.93	3269.05	0.33
13	13824	89.70	93.60	249.00	10634.48	3359.87	-85.56	3359.87	0.78
14	13916	88.20	93.00	249.00	10636.16	3451.69	-90.86	3451.69	1.76
15	**14007**	**88.30**	**92.60**	**251.00**	**10638.94**	**3542.54**	**-95.30**	**3542.54**	**0.45**
16	14099	88.80	93.40	248.00	10641.27	3634.39	-100.12	3634.39	1.03
17	14159	89.90	92.30	251.00	10641.95	3694.31	-103.10	3694.31	2.59
18	14190	90.20	92.20	251.00	10641.92	3725.28	-104.32	3725.28	1.02
19	14220	90.70	92.90	251.00	10641.69	3755.25	-105.65	3755.25	2.87
20	**14281**	**91.20**	**92.20**	**249.00**	**10640.67**	**3816.18**	**-108.36**	**3816.18**	**1.41**
21	14373	88.50	90.80	251.00	10640.92	3908.14	-110.77	3908.14	3.31
22	14468	89.70	91.60	255.00	10642.41	4003.10	-112.76	4003.10	1.52
23	14563	89.90	89.90	253.00	10642.74	4098.09	-114.00	4098.09	1.80
24	14659	90.40	91.70	255.00	10642.49	4194.08	-115.34	4194.08	1.95
25	**14754**	**89.50**	**90.00**	**253.00**	**10642.57**	**4289.06**	**-116.75**	**4289.06**	**2.02**
26	14850	90.20	90.60	257.00	10642.82	4385.06	-117.26	4385.06	0.96
27	14946	89.40	89.80	253.00	10643.16	4481.06	-117.59	4481.06	1.18
28	15041	87.60	88.90	257.00	10645.64	4576.01	-116.51	4576.01	2.12
29	15137	89.50	90.10	259.00	10648.07	4671.97	-115.68	4671.97	2.34
30	**15232**	**88.70**	**90.60**	**257.00**	**10649.57**	**4766.96**	**-116.26**	**4766.96**	**0.99**
31	15264	89.00	90.90	257.00	10650.21	4798.95	-116.68	4798.95	1.33
32	15328	89.80	90.60	257.00	10650.88	4862.94	-117.51	4862.94	1.33
33	15360	89.80	89.90	258.00	10650.99	4894.94	-117.65	4894.94	2.19
34	15424	88.50	88.50	257.00	10651.94	4958.92	-116.76	4958.92	2.98
35	**15520**	**89.10**	**89.00**	**260.00**	**10653.95**	**5054.88**	**-114.67**	**5054.88**	**0.81**
36	15583	89.80	89.10	260.00	10654.55	5117.87	-113.62	5117.87	1.12
37	15615	89.50	89.10	257.00	10654.75	5149.86	-113.12	5149.86	0.94
38	15679	88.50	89.10	260.00	10655.87	5213.84	-112.11	5213.84	1.56
39	15710	88.40	89.30	258.00	10656.71	5244.83	-111.68	5244.83	0.72
40	**15806**	**87.40**	**88.60**	**262.00**	**10660.22**	**5340.75**	**-109.92**	**5340.75**	**1.27**
41	15838	87.50	88.60	262.00	10661.65	5372.71	-109.14	5372.71	0.31
42	15902	88.00	88.00	262.00	10664.16	5436.63	-107.25	5436.63	1.22
43	15997	87.80	88.00	264.00	10667.64	5531.51	-103.93	5531.51	0.21
44	16029	87.70	87.70	262.00	10668.90	5563.46	-102.73	5563.46	0.99
45	**16092**	**88.80**	**88.30**	**261.00**	**10670.82**	**5626.39**	**-100.54**	**5626.39**	**1.99**
46	16124	89.30	88.30	262.00	10671.35	5658.37	-99.59	5658.37	1.56
47	16188	89.40	88.30	262.00	10672.08	5722.34	-97.69	5722.34	0.16
48	16220	89.60	88.50	262.00	10672.36	5754.33	-96.79	5754.33	0.88
49	16283	90.30	88.30	262.00	10672.41	5817.30	-95.04	5817.30	1.16
50	**16378**	**90.90**	**88.20**	**260.00**	**10671.42**	**5912.25**	**-92.13**	**5912.25**	**0.64**
51	16474	89.70	88.30	262.00	10670.91	6008.20	-89.20	6008.20	1.25
52	16570	89.70	88.70	264.00	10671.42	6104.17	-86.69	6104.17	0.42
53	16634	90.20	87.20	264.00	10671.47	6168.13	-84.40	6168.13	2.47
54	16665	90.00	87.30	262.00	10671.42	6199.09	-82.91	6199.09	0.72
55	**16758**	**88.70**	**87.20**	**266.00**	**10672.47**	**6291.97**	**-78.45**	**6291.97**	**1.40**
56	16854	89.40	88.10	267.00	10674.07	6387.88	-74.52	6387.88	1.19
57	16950	90.20	87.80	267.00	10674.40	6483.82	-71.08	6483.82	0.89
58	17045	89.10	89.00	266.00	10674.98	6578.77	-68.43	6578.77	1.71
59	17140	89.40	87.80	267.00	10676.22	6673.73	-65.78	6673.73	1.30
60	**17236**	**89.10**	**87.50**	**269.00**	**10677.48**	**6769.64**	**-61.84**	**6769.64**	**0.44**
61	17332	89.40	87.30	269.00	10678.74	6865.53	-57.49	6865.53	0.38
62	17428	89.40	87.00	271.00	10679.74	6961.41	-52.71	6961.41	0.31
63	17524	89.90	86.60	271.00	10680.33	7057.25	-47.35	7057.25	0.67
64	17619	89.90	88.40	267.00	10680.49	7152.16	-43.21	7152.16	1.89
65	**17683**	**89.30**	**87.40**	**269.00**	**10680.94**	**7216.11**	**-40.87**	**7216.11**	**1.82**

Report #: 2
Date: 4-Oct-11

Ryan Drilling Technologies & Solutions

Ryan Job # 5098
Kit # 27

SURVEY REPORT

Customer: Oasis/Rpm
Well Name: Chalmers 5300-31-19 H
Block or Section: Sidetrack #1
Rig #: Nabors 149
Calculation Method: Minimun Curvature Calculation

MWD Operator: Jace Pitre/ Nick Brochu
Directional Drillers: Jordan Jensen
Survey Corrected To: True North
Vertical Section Direction: 90
Survey Correction: 8.81
Temperature Forecasting Model (Chart Only): Logarithmic

Survey #	MD	Inc	Azm	Temp	TVD	VS	N/S	E/W	DLS
66	17715	88.40	86.90	267.00	10681.58	7248.07	-39.28	7248.07	3.22
67	17778	88.30	86.70	269.00	10683.40	7310.94	-35.76	7310.94	0.35
68	17810	88.10	87.00	267.00	10684.40	7342.88	-34.00	7342.88	1.13
69	17906	89.80	88.20	267.00	10686.16	7438.77	-29.98	7438.77	2.17
70	**17999**	**90.20**	**87.70**	**269.00**	**10686.16**	**7531.71**	**-26.66**	**7531.71**	**0.69**
71	18095	89.40	87.00	271.00	10686.50	7627.61	-22.22	7627.61	1.11
72	18191	89.40	86.20	271.00	10687.50	7723.43	-16.53	7723.43	0.83
73	18287	89.60	86.60	271.00	10688.34	7819.24	-10.50	7819.24	0.47
74	18319	89.80	86.70	271.00	10688.51	7851.19	-8.63	7851.19	0.70
75	**18382**	**90.10**	**87.70**	**267.00**	**10688.56**	**7914.11**	**-5.55**	**7914.11**	**1.66**
76	18478	89.00	88.30	271.00	10689.32	8010.05	-2.20	8010.05	1.31
77	18573	88.00	88.80	271.00	10691.80	8104.98	0.20	8104.98	1.18
78	18669	88.50	87.80	271.00	10694.74	8200.89	3.05	8200.89	1.16
79	18764	88.80	88.80	271.00	10696.97	8295.82	5.87	8295.82	1.10
80	**18859**	**89.80**	**88.20**	**271.00**	**10698.13**	**8390.78**	**8.35**	**8390.78**	**1.23**
81	18954	89.40	87.40	273.00	10698.80	8485.71	12.00	8485.71	0.94
82	19050	90.20	87.90	273.00	10699.13	8581.63	15.94	8581.63	0.98
83	19145	89.40	86.90	273.00	10699.46	8676.53	20.25	8676.53	1.35
84	19240	89.80	86.80	275.00	10700.13	8771.38	25.47	8771.38	0.43
85	**19336**	**89.90**	**85.60**	**275.00**	**10700.38**	**8867.17**	**31.83**	**8867.17**	**1.25**
86	19431	90.40	86.00	275.00	10700.13	8961.91	38.79	8961.91	0.67
87	19527	89.90	85.40	275.00	10699.88	9057.64	45.98	9057.64	0.81
88	19623	89.20	83.90	275.00	10700.63	9153.22	54.93	9153.22	1.72
89	19719	89.70	84.50	271.00	10701.55	9248.72	64.63	9248.72	0.81
90	**19815**	**90.00**	**85.20**	**275.00**	**10701.81**	**9344.33**	**73.25**	**9344.33**	**0.79**
91	19910	89.80	83.50	275.00	10701.97	9438.87	82.60	9438.87	1.80
92	20006	90.20	82.60	275.00	10701.97	9534.16	94.22	9534.16	1.03
93	20102	90.80	81.80	275.00	10701.13	9629.27	107.25	9629.27	1.04
94	20197	91.10	82.30	276.00	10699.56	9723.34	120.39	9723.34	0.61
95	**20249**	**90.90**	**81.70**	**275.00**	**10698.65**	**9774.83**	**127.62**	**9774.83**	**1.22**
Projection	20300	90.90	81.70	275.00	10697.85	9825.28	134.98	9825.28	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)

RECEIVED
MAY 2011
ND OIL & GAS DIVISION

Well File No.
20407

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

☑ Notice of Intent	Approximate Start Date: **July, 2011**	☐ 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 **Suspension of Drilling**	

Well Name and Number					
Chalmers 5300 31-19H					
Footages		Qtr-Qtr	Section	Township	Range
1535 F **S** L	**375** F **W** L	**LOT 3**	**19**	**153 N**	**100 W**
Field	Pool	County			
Wildcat	**Dakota**	**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 requests permission for suspension of drilling for up to 90 days for the referenced well under NDAC 43-02-03-55. Oasis intends to drill the surface hole with freshwater based drilling mud and set surface casing with a small drilling rig and move off within 3 to 5 days. The casing will be set at a depth pre-approved by the NDIC per the Application for Permit to Drill NDAC 43-02-03-21. No saltwater will be used in the drilling and cementing operations of the surface casing. Once the surface casing is cemented, a plug or mechanical seal will be placed at the top of the casing to prevent any foreign matter from getting into the well. A rig capable of drilling to TD will move onto the location within the 90 days previously outlined to complete the drilling and casing plan as per the APD. The undersigned states that this request for suspension of drilling operations in accordance with the Subsection 4 of Section 43-02-03-55 of the NDAC, is being requested to take advantage of the cost savings and time savings of using an initial rig that is smaller than the rig necessary to drill a well to total depth but is not intended to alter or extend the terms and conditions of, or suspend any obligation under, any oil and gas lease with acreage in or under the spacing or drilling unit for the above-referenced well. Oasis understands NDAC 43-02-03-31 requirements regarding confidentiality pertaining to this permit. The lined reserve pit will be fenced immediately after construction if the well pad is located in a pasture (NDAC 43-02-03-19 & 19.1). Oasis will plug and abandon the well and reclaim the well site if the well is not drilled by the larger rotary rig within 90 days after spudding the well with the smaller drilling rig.

Company		Telephone Number
Oasis Petroleum North America LLC		**281.404.9488**
Address		
1001 Fannin, Suite 1500		
City	State	Zip Code
Houston	**TX**	**77002**
Signature	Printed Name	
	Laura Strong	
Title	Date	
Drilling Engineer	**May 11, 2011**	
Email Address		
Lstrong@oasispetroleum.com		

FOR STATE USE ONLY

☐ Received	☒ Approved
Date: 5/27/11	
By:	
Title: Resource Permit Manager	

NORTH DAKOTA
OIL AND GAS DIVISION

Oil and Gas Division 20407

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

ROBIN E. HESKETH
OASIS PETROLEUM NORTH AMERICA LLC
1001 FANNIN, SUITE 1500
HOUSTON, TX 77002 USA

Date: **2/3/2011**

RE: CORES AND SAMPLES

Well Name: **CHALMERS 5300 31-19H** Well File No.: **20407**
Location: **LOT3 19-153-100** County: MCKENZIE
Permit Type: **Wildcat - HORIZONTAL**
Field: **WILDCAT** Target Horizon: BAKKEN

Dear ROBIN E. HESKETH:

North Dakota Century Code (NDCC) 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 the NDCC Section 38-08-04 and North Dakota Administrative Code 43-02-03-38.1.

2) Samples shall include all cuttings from:

Base of the Last Charles Salt

Samples of cuttings shall be taken at 30' maximum intervals through all vertical, build and horizontal sections. Samples must be washed, dried, packed in sample envelopes in correct order with labels showing operator, well name, location and depth, and forwarded in standard boxes to the State Geologist within 30 days of the completion of drilling operations.

3) Cores: ALL CORES cut shall be preserved in correct order, properly boxed, and forwarded to the State Geologist within 90 days of completion of drilling operations. Any extension of time must have written approval from the State Geologist.

4) All cores, core chips, and samples must be shipped, prepaid, to the State Geologist at the following address:

ND Geological Survey Core Library
Campus Road and Cornell
Grand Forks, ND 58202

5) NDCC 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

Richard A. Suggs
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.oilgas.nd.gov

February 3, 2011

Brandi Terry
Engineering Tech
OASIS PETROLEUM NORTH AMERICA LLC
1001 Fannin Suite 1500
Houston, TX 77002

RE: HORIZONTAL WELL
CHALMERS 5300 31-19H
LOT3 Section 19-153N-100W
MCKENZIECounty
Well File # 20407

Dear Brandi :

Pursuant to Commission Order No. 14638, 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 1220' setback (per Commission policy) from the north & south boundaries and 200' setback from the east & west boundaries within the 1280 acre drilling unit consisting of Section 19 & 20 T153N R100W.

PERMIT STIPULATIONS: OASIS PETRO NO AMER must contact NDIC Field Inspector Kevin Connors at 701-220-5989 prior to location construction.

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.

Reserve pit

Please be advised that conditions may be imposed on the use and reclamation of a drilling reserve pit on this site if specific site conditions warrant.

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 a Cement Bond Log from which the presence of cement can be determined in every well in which production or intermediate casing has been set and a Gamma Ray Log must be run from total depth to ground level elevation of the well bore. All logs must be submitted as one paper copy and one digital copy in LAS (Log ASCII) format, or a format approved by the Director. Image logs that include, but are not limited to, Mud Logs, Cement Bond Logs, and Cyberlook Logs, cannot be produced in their entirety as LAS (Log ASCII) files. To create a solution and establish a standard format for industry to follow when submitting image logs, the Director has given approval for the operator to submit an image log as a TIFF (*.tif) formatted file. The TIFF (*.tif) format will be accepted only when the log cannot be produced in its entirety as a LAS (Log ASCII) file format. The digital copy may be submitted on a 3.5" floppy diskette, a standard CD, 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**	**6 / 1 / 2011**	**No**

Operator	Telephone Number
OASIS PETROLEUM NORTH AMERICA LLC	**281-404-9491**

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

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

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

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

Well Name	Well Number
CHALMERS	**5300 31-19H**

Surface Footages	Qtr-Qtr	Section	Township	Range	County
1535 F **S** L **375** F **W** L	**LOT3**	**19**	**153 N**	**100 W**	**MCKENZIE**
Longstring Casing Point Footages	Qtr-Qtr	Section	Township	Range	County
1535 F **S** L **867** F **W** L	**NWSW**	**19**	**153 N**	**100 W**	**Williams**
Longstring Casing Point Coordinates From Well Head	Azimuth	Longstring Total Depth			
0 S From WH **492 E** From WH	**90.0 º**	**10845** Feet MD	**10558** Feet TVD		
Bottom Hole Footages From Nearest Section Line	Qtr-Qtr	Section	Township	Range	County
1535 F **S** L **200** F **E** L	**NESE**	**20**	**153 N**	**100 W**	**Williams**

Bottom Hole Coordinates From Well Head	KOP Lateral 1	Azimuth Lateral 1	Estimated Total Depth Lateral 1
0 S From WH **9938 E** From WH	**10081** Feet MD	**90.0 º**	**20291** Feet MD **10621** Feet TVD

Latitude of Well Head	Longitude of Well Head	NAD Reference	Description of (Subject to NDIC Approval)
48 ° 03 ' 26.47 "	**-103 ° 36 ' 09.41 "**	**WGS84**	**DRILLING UNIT Section 19 & 20 T153N R100W**

Ground Elevation	Acres in Spacing/Drilling Unit	Spacing/Drilling Unit Setback Requirement	Industrial Commission Order
1908 Feet Above S.L.	**1280**	**1220** Feet N/S **200** Feet E/W	**14638**

North Line of Spacing/Drilling Unit	South Line of Spacing/Drilling Unit	East Line of Spacing/Drilling Unit	West Line of Spacing/Drilling Unit
10489 Feet	**10513** Feet	**5280** Feet	**5264** Feet

Objective Horizons	Pierre Shale Top
Bakken	**1780**

Proposed	Size	Weight	Depth	Cement Volume	
Surface Casing	**9 - 5/8 "**	**36** Lb./Ft.	**1880** Feet	**575** 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.	**10845** Feet MD	**10558** Feet TVD	**810** Sacks	**4781** Feet	**5208** Feet

Base Last Charles Salt (If Applicable)	
9034 Feet	**NOTE: Intermediate or longstring casing string must be cemented above the top Dakota Group Sand.**

Proposed Logs
Triple Combo:KOP to KibbyGR/RES TO BSCGR TO SURFCBL/GR TOC/GR TO BSC

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 and the well bore is within 150 feet of the respective setback requirement; 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

Additional Attachments: Drill Plan with geological tops/mud Well Summary with casing and cement plans Directional plan/plot and surveyor's plats.

Lateral 2

KOP Lateral 2 Feet MD	Azimuth Lateral 2 º	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 º	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 º	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 º	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 1 / 28 / 2011
ePermit	Printed Name **Brandi Terry**	Title **Engineering Tech**

FOR STATE USE ONLY

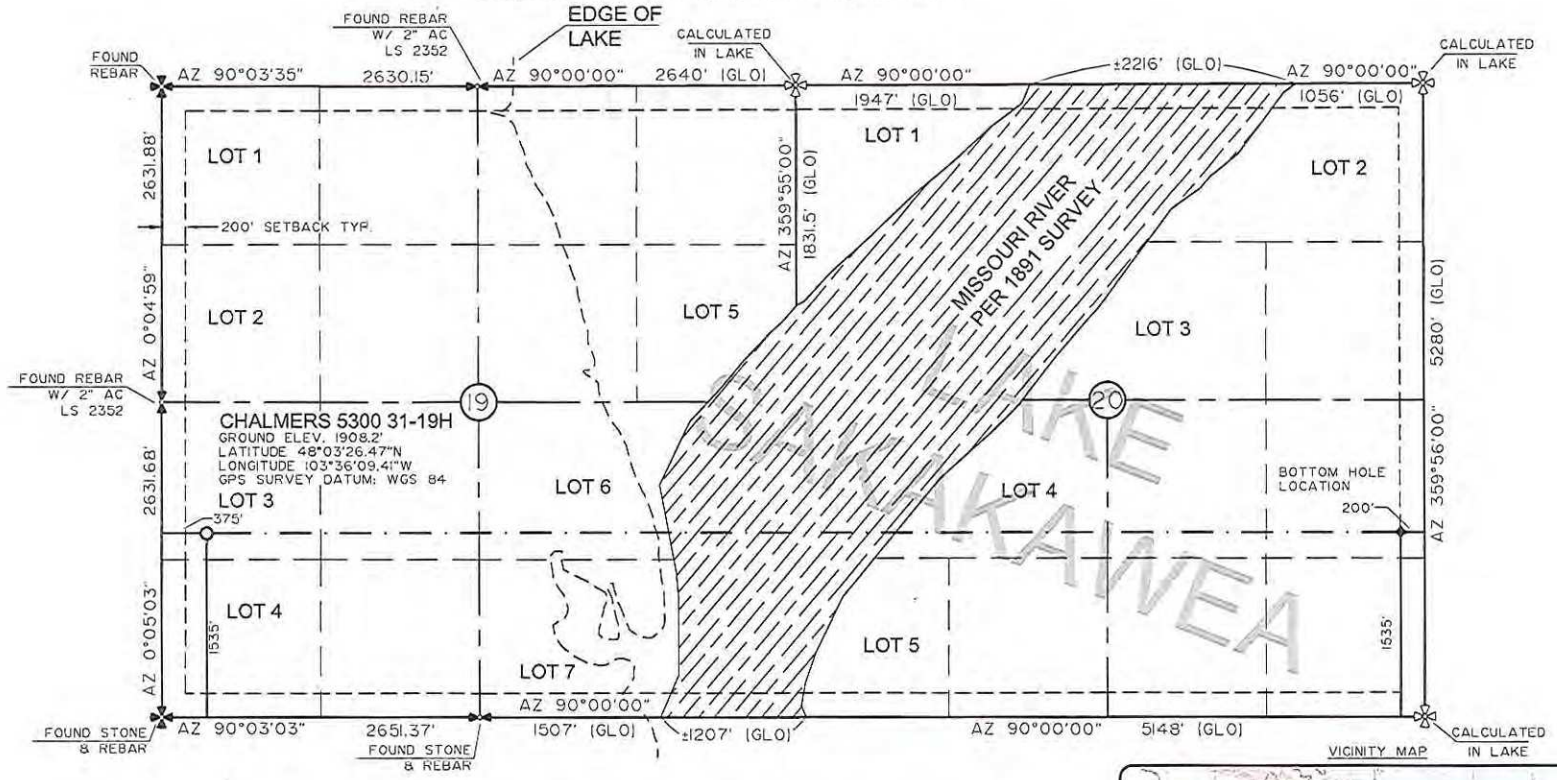
Permit and File Number **20407**	API Number **33 - 053 - 03472**
Field **WILDCAT**	
Pool **BAKKEN**	Permit Type **WILDCAT**

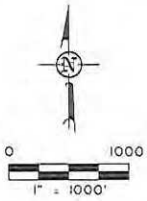
FOR STATE USE ONLY

Date Approved **2 / 3 / 2011**
By **Nathaniel Erbele**
Title **Petroleum Resource Specialist**

WELL LOCATION PLAT

OASIS PETROLEUM NORTH AMERICA, LLC
1001 FANNIN, SUITE 202 HOUSTON, TX 77002
"CHALMERS 5300 31-19H"
1535 FEET FROM SOUTH LINE AND 375 FEET FROM WEST LINE
SECTION 19, T153N, R100W, 5th P.M., MCKENZIE COUNTY, NORTH DAKOTA





- MONUMENT - RECOVERED
- MONUMENT - NOT RECOVERED

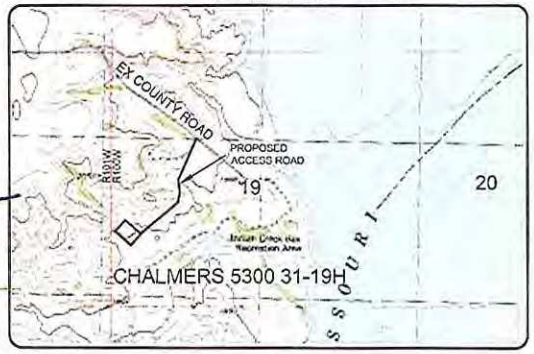
STAKED ON 9/23/10
VERTICAL CONTROL DATUM WAS BASED UPON
CONTROL POINT 13 WITH AN ELEVATION OF 2090.8'

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

ROBERT L. PROVOST 2884S
INTERSTATE ENGINEERING INC.
P.O. BOX 648

REGISTERED LAND SURVEYOR
ROBERT L. PROVOST
LS-2884
DATE: 9/30/10
NORTH DAKOTA

VICINITY MAP



Revision No.	Date	By	Description

OASIS PETROLEUM NORTH AMERICA, LLC
WELL LOCATION PLAT
SECTION 19, T153N, R100W
MCKENZIE COUNTY, NORTH DAKOTA
Drawn By: JJS | Project No.: 510-09-183
Checked By: JLH/RLP | Date: SEPT 2010

Interstate Engineering, Inc.
P.O. Box 648
425 East Main Street
Sidney, Montana 59270
Phone (406) 433-5617
Fax (406) 433-5618
www.interstateeng.com

INTERSTATE ENGINEERING
Professionals you need, people you trust

SHEET NO. 1

Oasis Petroleum
Well Summary
Chalmers 5300 31-19H
Section 19 T153N R100W
Williams 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 1,880’	36	J-55	LTC	8.921"	8.765"	3400	4530	5660

Interval	Description	Collapse	Burst	Tension
		(psi) a	(psi) b	(1000 lbs) c
0’ to 1,880’	9-5/8", 36#, J-55, LTC, 8rd	2020 / 2.3	3520 / 4.0	453 / 2.86

API Rating & Safety Factor

a) Based on full casing evacuation with 9.0 ppg fluid on backside (1,880’ setting depth).
b) Burst pressure based on 9 ppg fluid with no fluid on backside (1,880’ setting depth).
c) Based on string weight in 9.0 ppg fluid at 1,880’ TVD plus 100k# overpull. (Buoyed weight equals 58k lbs.)

Cement volumes are based on 9-5/8" casing set in 13-1/2" hole with 55% excess to circulate cement back to surface. Mix and pump the following slurry.

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

Lead Slurry: **350 sks** (196 bbls) Conventional system with 94 lb/sk cement, 4% extender, 2% expanding agent, 2% CaCl2 and 0.25 lb/sk lost circulation control agent

Tail Slurry: **225 sks** (60 bbls) Conventional system with 94 lb/sk cement, 3% NaCl, and .25 lb/sk lost circulation control agent

Oasis Petroleum
Well Summary
Chalmers 5300 31-19H
Section 19 T153N R100W
Williams County, ND

INTERMEDIATE CASING AND CEMENT DESIGN

Intermediate Casing Design

							Make-up Torque (ft-lbs)		
Size	**Interval**	**Weight**	**Grade**	**Coupling**	**I.D.**	**Drift**	**Minimum**	**Optimum**	**Max**
7"	0' – 6,500'	29	P-110	LTC	6.184"	6.059"	5,980	7,970	8,770
7"	6,500' – 9,200'	32	HCP-110	LTC	6.094"	6.000"**	6,730	8,970	9,870
7"	9,200' – 10,845'	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' – 6,500'	6,500'	7", 29#, P-110, LTC, 8rd	8,530 / 2.5	11,220 / 1.19	797 / 2.18
6,500' – 9,200'	2,700'	7", 32#, HCP-110, LTC, 8rd	11,820 / 1.11	12,460 / 1.3	
9,200' – 10,845'	1,645'	7", 29#, P-110, LTC, 8rd	8,530 / 1.5	11,220 / 1.16	

API Rating & Safety Factor

a) Collapse Strength Reduction Factor = .963 @ 7,900' & negligible below 9470'. Assume full casing evacuation with 10 ppg fluid on backside (from 0 to 6,500' & 9,200' to 10,845'). And assume full casing evacuation with 1.2 psi/ft equivalent fluid gradient across salt intervals (from 6,500' to 9,200' TVD).

b) Burst pressure based on 9,000 psig max press for stimulation plus 10.2 ppg fluid in casing and 9.0 ppg fluid on on backside—to 10,558' TVD.

c) Based on string weight in 10 ppg fluid, (265k lbs) plus 100k#.

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

Pre-flush (Spacer): **150 bbls** Saltwater
20 bbls CW8 System
10 bbls Fresh Water

Lead Slurry: **155 sks** (71 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, 0.6% retarder, 0.0 lb/sk lost circulation control agent, and 0.4% dispersant

Tail Slurry: **655 sks** (192 bbls) Conventional system with 94 lb/sk cement, 10% NaCl, 35% Silica, 0.2% fluid loss agent, 0.8% dispersant, 0.0 lb/sk lost circulation control agent and 0.3% retarder

Oasis Petroleum
Well Summary
Chalmers 5300 31-19H
Section 19 T153N R100W
Williams County, ND

PRODUCTION LINER

							Make-up Torque (ft-lbs)		
Size	**Interval**	**Weight**	**Grade**	**Coupling**	**I.D.**	**Drift**	**Minimum**	**Optimum**	**Max**
4-1/2"	10,030' to 20,291'	11.6	P-110	LTC	4.000"	3.875"	2,270	3,020	3,780

Interval	**Description**	**Collapse**	**Burst**	**Tension**	**Cost per ft**
		(psi) **a**	(psi) **b**	(1000 lbs) **c**	
10,030' to 20,291'	4-1/2", 11.6 lb, P-110, LTC, 8rd	7,580 / 1.4	10,690 / 1.1	277 / 1.37	

API Rating & Safety Factor

a) Based on full casing evacuation with 9.5 ppg fluid on backside @ 10,558' TVD.
b) Burst pressure based on 9,000psi Stimulation pressure with 10.2 ppg internal fluid gradient with 9.0 ppg gradient on backside at 10,558' TVD.
c) Based on string weight in 9.5 ppg fluid (Buoyed weight: 102k lbs.) plus 100k lbs overpull.

DRILLING PLAN

PROSPECT/FIELD	Indian Hills	**Horizontal Middle Bakken**	**COUNTY/STATE**	McKenzie Co., ND	
OPERATOR	Oasis		**RIG**	XTC-17	
WELL NO.	5300 31-19H		**LEASE**	Chalmers	
LOCATION	NWSW 19-153N-100W	Surface Location (survey plat): 1535' fsl	375' fwl		
EST. T.D.	20,291 ' MD		**GROUND ELEV:**	1904 Finished Pad Elev.	**Sub Hieght:** 16
	TOTAL LATERAL:	9,446' (est)	**KB ELEV:**	1920	

PROGNOSIS: Based on 1,920' KB(est)

MARKER		DEPTH (Surf Loc)	DATUM (Surf Loc)
Pierre	NDIC MAP	1,780	140
Greenhorn		4,382	-2462
Mowry		4,795	-2875
Dakota		5,208	-3288
Rierdon		6,156	-4236
Dunham Salt		6,664	-4744
Dunham Salt Base		6,738	-4818
Spearfish		6,742	-4822
Pine Salt		7,058	-5138
Pine Salt Base		7,129	-5209
Opeche Salt		7,173	-5253
Opeche Salt Base		7,243	-5323
Broom Creek		7,383	-5463
Amsden (Top of Minnelusa Gp.)		7,436	-5516
Tyler		7,760	-5840
Otter (Base of Minnelusa Gp.)		7,836	-5916
Kibbey		8,189	-6269
Charles Salt		8,327	-6407
UB		8,932	-7012
Base Last Salt		9,034	-7114
Ratcliffe		9,074	-7154
Mission Canyon		9,254	-7334
Lodgepole		9,816	-7896
Lodgepole Fracture Zone		10,079	-8159
False Bakken		10,525	-8605
Upper Bakken		10,534	-8614
Middle Bakken		10,547	-8627
Middle Bakken Sand Target		10,558	-8638
Base Middle Bakken Sand Target		10,570	-8650
Lower Bakken		10,587	-8667
Three Forks		10,613	-8693

Dip Rate: **-0.4° or .67ft /100ft down**

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
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 1000'

DST'S:

None planned

CORES:

None planned

MUDLOGGING:

Two-Man: 8,127'
~200' above the Charles (Kibbey) to Casing point; Casing point to TD
30' samples at direction of wellsite geologist; 10' through target @ curve land

BOP:

11" 5000 psi blind, pipe & annular

Max. Anticipated BHP: 5615

Surface Formation: *Glacial till*

MUD:	Interval		Type	WT	Vis	WL	Remarks
Surface	0' -	1,880'	FW/Gel - Lime Sweeps				Circ Mud Tanks
Intermediate	1,880' -	10,845'	Invert				Circ Mud Tanks
Liner	10,030' -	20,291'	Salt Water				Circ Mud Tanks

CASING:	Size	Wt ppf	Hole	Depth		Cement	WOC	Remarks
Surface:	9-5/8"	36#	13-1/2"	1,880'		To Surface	12	100' into Pierre
Intermediate:	7"	29/32#	8-3/4"	10,845'		4781	24	500' above Dakota
Production Liner:	4.5"	11.6#	6"	20,291'	**TOL @ 10,030'**			50' above KOP

PROBABLE PLUGS, IF REQ'D:

OTHER:

	MD	TVD	FNL/FSL	FEL/FWL	S-T-R	AZI
Surface:	1,880'	1880	1535' FSL	375' FWL	**19-T153N-R100W**	N/A
KOP:	10,081'	10,081'	1535' FSL	375' FWL	**19-T153N-R100W**	N/A
EOC:	10,827'	10,558'	1535' FSL	849' FWL	**19-T153N-R100W**	90.0
Casing Point:	10,845'	10,558'	1535' FSL	867' FWL	**19-T153N-R100W**	90.0
Middle Bakken Lateral TD:	20,291'	10,621'	1535' FSL	200' FEL	**20-T153N-R100W**	90.0

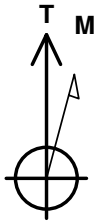
Survey Company:
Build Rate: 12 deg /100'

Comments:

DRILL TO KOP AND LOG.

DRILL CURVE TO 90 DEG AND 7" CASING POINT
SET 7" CASING. DRILL THREE FORKS LATERAL.
MWD Surveys will be taken every 100' in vertical hole, and a minimum of every 30' while building curve and every 90' while drilling latera
MWD GR to be run from KOP to Lateral TD.
GR must be run to ground surface.

Geology: ACNelson 10/14/2010 **Engineering:** L Strong BT-REV 2-2-2011



Azimuths to True North
Magnetic North: 8.81°

Magnetic Field
Strength: 56793.9snT
Dip Angle: 73.15°
Date: 1/4/2011
Model: IGRF2010

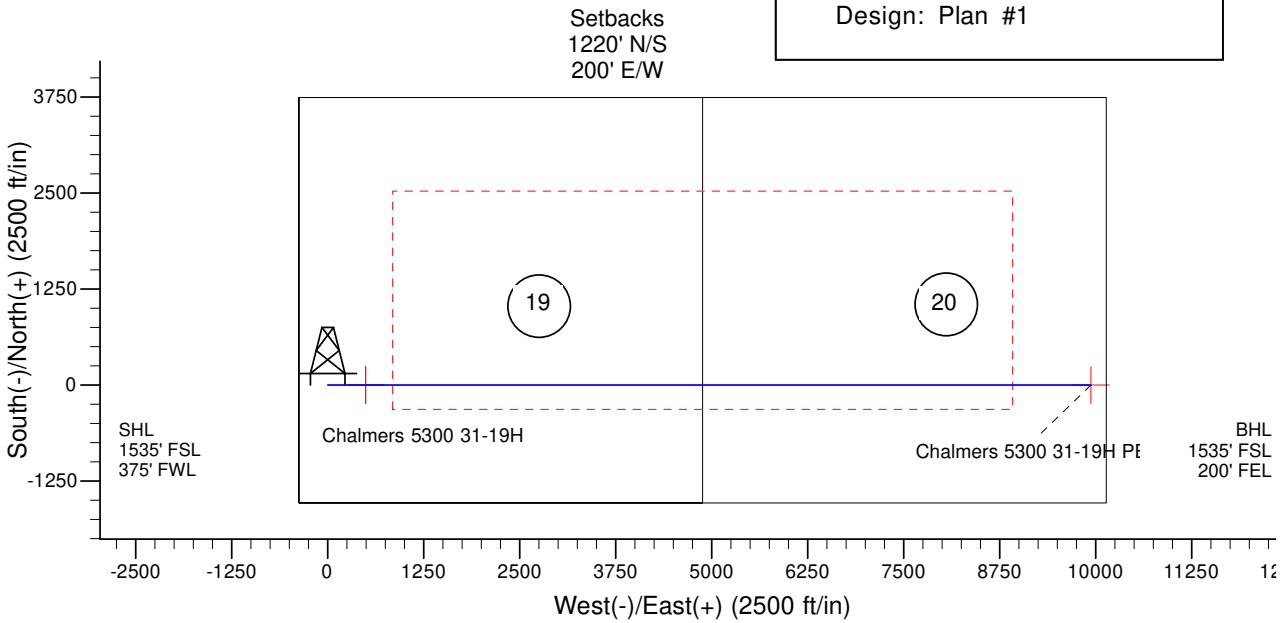
OASIS PETROLEUM

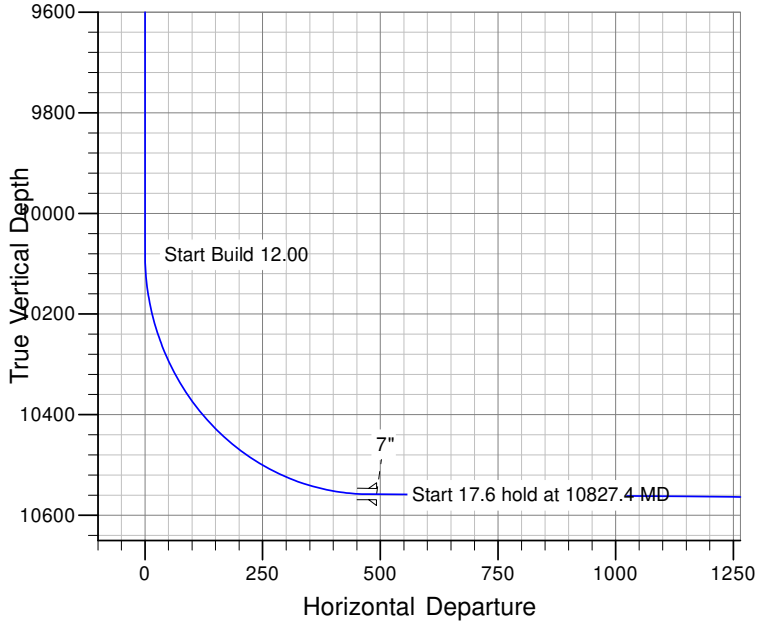
Project: McKenzie County, ND
Site: Sec. 19 T153N R100W
Well: Chalmers 5300 31-19H
Wellbore: OH
Design: Plan #1

SITE DETAILS: Sec. 19 T153N R100W

Site Centre Latitude: 48° 3' 26.470 N
Longitude: 103° 36' 9.410 W

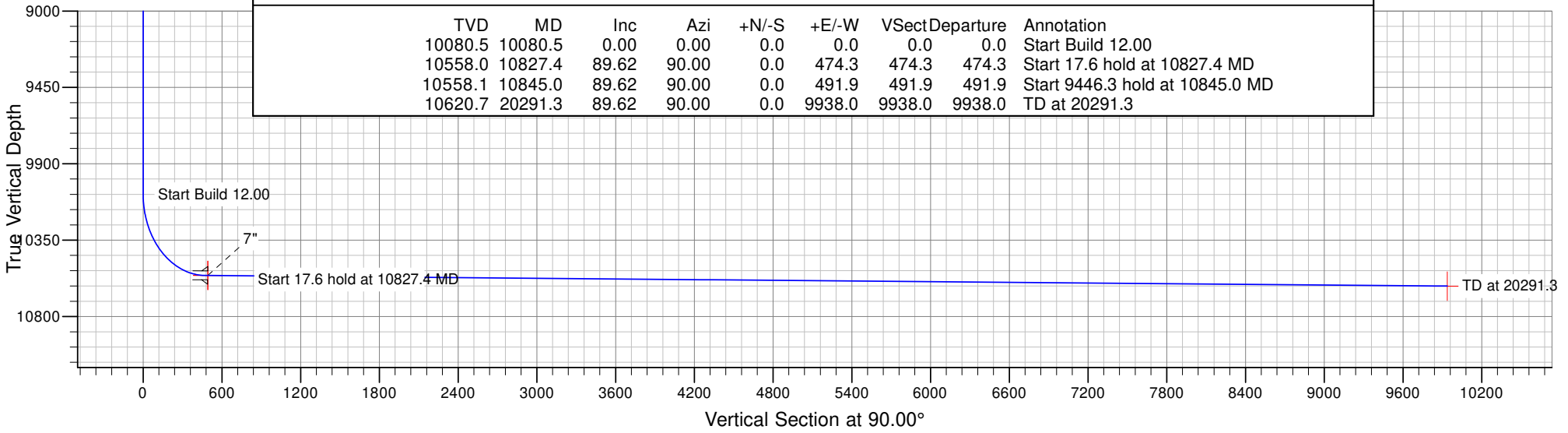
Positional Uncertainity: 0.0
Convergence: -2.31
Local North: True





ANNOTATIONS

TVD	MD	Inc	Azi	+N/-S	+E/-W	VSect	Departure	Annotation
10080.5	10080.5	0.00	0.00	0.0	0.0	0.0	0.0	Start Build 12.00
10558.0	10827.4	89.62	90.00	0.0	474.3	474.3	474.3	Start 17.6 hold at 10827.4 MD
10558.1	10845.0	89.62	90.00	0.0	491.9	491.9	491.9	Start 9446.3 hold at 10845.0 MD
10620.7	20291.3	89.62	90.00	0.0	9938.0	9938.0	9938.0	TD at 20291.3



Oasis

McKenzie County, ND
Sec. 19 T153N R100W
Chalmers 5300 31-19H

OH

Plan: Plan #1

Survey Report - Geographic

02 February, 2011

Survey Report - Geographic

Company:	Oasis	**Local Co-ordinate Reference:**	Well Chalmers 5300 31-19H
Project:	McKenzie County, ND	**TVD Reference:**	WELL @ 1920.0ft (Original Well Elev)
Site:	Sec. 19 T153N R100W	**MD Reference:**	WELL @ 1920.0ft (Original Well Elev)
Well:	Chalmers 5300 31-19H	**North Reference:**	True
Wellbore:	OH	**Survey Calculation Method:**	Minimum Curvature
Design:	Plan #1	**Database:**	EDM Network

Project McKenzie County, ND

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

Site Sec. 19 T153N R100W

Site Position:		**Northing:**	122,216.07 m	**Latitude:**	48° 3' 26.470 N
From:	Lat/Long	**Easting:**	368,800.47 m	**Longitude:**	103° 36' 9.410 W
Position Uncertainty:	0.0 ft	**Slot Radius:**	13.200 in	**Grid Convergence:**	-2.31 °

Well Chalmers 5300 31-19H

Well Position	**+N/-S**	0.0 ft	**Northing:**	122,216.07 m	**Latitude:**	48° 3' 26.470 N
	+E/-W	0.0 ft	**Easting:**	368,800.47 m	**Longitude:**	103° 36' 9.410 W
Position Uncertainty		0.0 ft	**Wellhead Elevation:**	ft	**Ground Level:**	1,904.0 ft

Wellbore OH

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	1/4/2011	8.81	73.15	56,794

Design Plan #1

Audit Notes:

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

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

Survey Tool Program **Date** 2/2/2011

From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
0.0	20,291.3	Plan #1 (OH)	MWD	MWD - Standard

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (m)	Map Easting (m)	Latitude	Longitude
0.0	0.00	0.00	0.0	0.0	0.0	122,216.07	368,800.47	48° 3' 26.470 N	103° 36' 9.410 W
100.0	0.00	0.00	100.0	0.0	0.0	122,216.07	368,800.47	48° 3' 26.470 N	103° 36' 9.410 W
200.0	0.00	0.00	200.0	0.0	0.0	122,216.07	368,800.47	48° 3' 26.470 N	103° 36' 9.410 W
300.0	0.00	0.00	300.0	0.0	0.0	122,216.07	368,800.47	48° 3' 26.470 N	103° 36' 9.410 W
400.0	0.00	0.00	400.0	0.0	0.0	122,216.07	368,800.47	48° 3' 26.470 N	103° 36' 9.410 W
500.0	0.00	0.00	500.0	0.0	0.0	122,216.07	368,800.47	48° 3' 26.470 N	103° 36' 9.410 W
600.0	0.00	0.00	600.0	0.0	0.0	122,216.07	368,800.47	48° 3' 26.470 N	103° 36' 9.410 W
700.0	0.00	0.00	700.0	0.0	0.0	122,216.07	368,800.47	48° 3' 26.470 N	103° 36' 9.410 W
800.0	0.00	0.00	800.0	0.0	0.0	122,216.07	368,800.47	48° 3' 26.470 N	103° 36' 9.410 W
900.0	0.00	0.00	900.0	0.0	0.0	122,216.07	368,800.47	48° 3' 26.470 N	103° 36' 9.410 W
1,000.0	0.00	0.00	1,000.0	0.0	0.0	122,216.07	368,800.47	48° 3' 26.470 N	103° 36' 9.410 W
1,100.0	0.00	0.00	1,100.0	0.0	0.0	122,216.07	368,800.47	48° 3' 26.470 N	103° 36' 9.410 W

Company:	Oasis	**Local Co-ordinate Reference:**	Well Chalmers 5300 31-19H
Project:	McKenzie County, ND	**TVD Reference:**	WELL @ 1920.0ft (Original Well Elev)
Site:	Sec. 19 T153N R100W	**MD Reference:**	WELL @ 1920.0ft (Original Well Elev)
Well:	Chalmers 5300 31-19H	**North Reference:**	True
Wellbore:	OH	**Survey Calculation Method:**	Minimum Curvature
Design:	Plan #1	**Database:**	EDM Network

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (m)	Map Easting (m)	Latitude	Longitude
1,200.0	0.00	0.00	1,200.0	0.0	0.0	122,216.07	368,800.47	48° 3' 26.470 N	103° 36' 9.410 W
1,300.0	0.00	0.00	1,300.0	0.0	0.0	122,216.07	368,800.47	48° 3' 26.470 N	103° 36' 9.410 W
1,400.0	0.00	0.00	1,400.0	0.0	0.0	122,216.07	368,800.47	48° 3' 26.470 N	103° 36' 9.410 W
1,500.0	0.00	0.00	1,500.0	0.0	0.0	122,216.07	368,800.47	48° 3' 26.470 N	103° 36' 9.410 W
1,600.0	0.00	0.00	1,600.0	0.0	0.0	122,216.07	368,800.47	48° 3' 26.470 N	103° 36' 9.410 W
1,700.0	0.00	0.00	1,700.0	0.0	0.0	122,216.07	368,800.47	48° 3' 26.470 N	103° 36' 9.410 W
1,780.0	0.00	0.00	1,780.0	0.0	0.0	122,216.07	368,800.47	48° 3' 26.470 N	103° 36' 9.410 W
Pierre									
1,800.0	0.00	0.00	1,800.0	0.0	0.0	122,216.07	368,800.47	48° 3' 26.470 N	103° 36' 9.410 W
1,880.0	0.00	0.00	1,880.0	0.0	0.0	122,216.07	368,800.47	48° 3' 26.470 N	103° 36' 9.410 W
9 5/8"									
1,900.0	0.00	0.00	1,900.0	0.0	0.0	122,216.07	368,800.47	48° 3' 26.470 N	103° 36' 9.410 W
2,000.0	0.00	0.00	2,000.0	0.0	0.0	122,216.07	368,800.47	48° 3' 26.470 N	103° 36' 9.410 W
2,100.0	0.00	0.00	2,100.0	0.0	0.0	122,216.07	368,800.47	48° 3' 26.470 N	103° 36' 9.410 W
2,200.0	0.00	0.00	2,200.0	0.0	0.0	122,216.07	368,800.47	48° 3' 26.470 N	103° 36' 9.410 W
2,300.0	0.00	0.00	2,300.0	0.0	0.0	122,216.07	368,800.47	48° 3' 26.470 N	103° 36' 9.410 W
2,400.0	0.00	0.00	2,400.0	0.0	0.0	122,216.07	368,800.47	48° 3' 26.470 N	103° 36' 9.410 W
2,500.0	0.00	0.00	2,500.0	0.0	0.0	122,216.07	368,800.47	48° 3' 26.470 N	103° 36' 9.410 W
2,600.0	0.00	0.00	2,600.0	0.0	0.0	122,216.07	368,800.47	48° 3' 26.470 N	103° 36' 9.410 W
2,700.0	0.00	0.00	2,700.0	0.0	0.0	122,216.07	368,800.47	48° 3' 26.470 N	103° 36' 9.410 W
2,800.0	0.00	0.00	2,800.0	0.0	0.0	122,216.07	368,800.47	48° 3' 26.470 N	103° 36' 9.410 W
2,900.0	0.00	0.00	2,900.0	0.0	0.0	122,216.07	368,800.47	48° 3' 26.470 N	103° 36' 9.410 W
3,000.0	0.00	0.00	3,000.0	0.0	0.0	122,216.07	368,800.47	48° 3' 26.470 N	103° 36' 9.410 W
3,100.0	0.00	0.00	3,100.0	0.0	0.0	122,216.07	368,800.47	48° 3' 26.470 N	103° 36' 9.410 W
3,200.0	0.00	0.00	3,200.0	0.0	0.0	122,216.07	368,800.47	48° 3' 26.470 N	103° 36' 9.410 W
3,300.0	0.00	0.00	3,300.0	0.0	0.0	122,216.07	368,800.47	48° 3' 26.470 N	103° 36' 9.410 W
3,400.0	0.00	0.00	3,400.0	0.0	0.0	122,216.07	368,800.47	48° 3' 26.470 N	103° 36' 9.410 W
3,500.0	0.00	0.00	3,500.0	0.0	0.0	122,216.07	368,800.47	48° 3' 26.470 N	103° 36' 9.410 W
3,600.0	0.00	0.00	3,600.0	0.0	0.0	122,216.07	368,800.47	48° 3' 26.470 N	103° 36' 9.410 W
3,700.0	0.00	0.00	3,700.0	0.0	0.0	122,216.07	368,800.47	48° 3' 26.470 N	103° 36' 9.410 W
3,800.0	0.00	0.00	3,800.0	0.0	0.0	122,216.07	368,800.47	48° 3' 26.470 N	103° 36' 9.410 W
3,900.0	0.00	0.00	3,900.0	0.0	0.0	122,216.07	368,800.47	48° 3' 26.470 N	103° 36' 9.410 W
4,000.0	0.00	0.00	4,000.0	0.0	0.0	122,216.07	368,800.47	48° 3' 26.470 N	103° 36' 9.410 W
4,100.0	0.00	0.00	4,100.0	0.0	0.0	122,216.07	368,800.47	48° 3' 26.470 N	103° 36' 9.410 W
4,200.0	0.00	0.00	4,200.0	0.0	0.0	122,216.07	368,800.47	48° 3' 26.470 N	103° 36' 9.410 W
4,300.0	0.00	0.00	4,300.0	0.0	0.0	122,216.07	368,800.47	48° 3' 26.470 N	103° 36' 9.410 W
4,382.0	0.00	0.00	4,382.0	0.0	0.0	122,216.07	368,800.47	48° 3' 26.470 N	103° 36' 9.410 W
Greenhorn									
4,400.0	0.00	0.00	4,400.0	0.0	0.0	122,216.07	368,800.47	48° 3' 26.470 N	103° 36' 9.410 W
4,500.0	0.00	0.00	4,500.0	0.0	0.0	122,216.07	368,800.47	48° 3' 26.470 N	103° 36' 9.410 W
4,600.0	0.00	0.00	4,600.0	0.0	0.0	122,216.07	368,800.47	48° 3' 26.470 N	103° 36' 9.410 W
4,700.0	0.00	0.00	4,700.0	0.0	0.0	122,216.07	368,800.47	48° 3' 26.470 N	103° 36' 9.410 W
4,795.0	0.00	0.00	4,795.0	0.0	0.0	122,216.07	368,800.47	48° 3' 26.470 N	103° 36' 9.410 W
Mowry									
4,800.0	0.00	0.00	4,800.0	0.0	0.0	122,216.07	368,800.47	48° 3' 26.470 N	103° 36' 9.410 W
4,900.0	0.00	0.00	4,900.0	0.0	0.0	122,216.07	368,800.47	48° 3' 26.470 N	103° 36' 9.410 W
5,000.0	0.00	0.00	5,000.0	0.0	0.0	122,216.07	368,800.47	48° 3' 26.470 N	103° 36' 9.410 W
5,100.0	0.00	0.00	5,100.0	0.0	0.0	122,216.07	368,800.47	48° 3' 26.470 N	103° 36' 9.410 W
5,200.0	0.00	0.00	5,200.0	0.0	0.0	122,216.07	368,800.47	48° 3' 26.470 N	103° 36' 9.410 W
5,208.0	0.00	0.00	5,208.0	0.0	0.0	122,216.07	368,800.47	48° 3' 26.470 N	103° 36' 9.410 W
Dakota									
5,300.0	0.00	0.00	5,300.0	0.0	0.0	122,216.07	368,800.47	48° 3' 26.470 N	103° 36' 9.410 W
5,400.0	0.00	0.00	5,400.0	0.0	0.0	122,216.07	368,800.47	48° 3' 26.470 N	103° 36' 9.410 W
5,500.0	0.00	0.00	5,500.0	0.0	0.0	122,216.07	368,800.47	48° 3' 26.470 N	103° 36' 9.410 W

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Site:	Sec. 19 T153N R100W	**MD Reference:**	WELL @ 1920.0ft (Original Well Elev)
Well:	Chalmers 5300 31-19H	**North Reference:**	True
Wellbore:	OH	**Survey Calculation Method:**	Minimum Curvature
Design:	Plan #1	**Database:**	EDM Network

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (m)	Map Easting (m)	Latitude	Longitude
5,600.0	0.00	0.00	5,600.0	0.0	0.0	122,216.07	368,800.47	48° 3' 26.470 N	103° 36' 9.410 W
5,700.0	0.00	0.00	5,700.0	0.0	0.0	122,216.07	368,800.47	48° 3' 26.470 N	103° 36' 9.410 W
5,800.0	0.00	0.00	5,800.0	0.0	0.0	122,216.07	368,800.47	48° 3' 26.470 N	103° 36' 9.410 W
5,900.0	0.00	0.00	5,900.0	0.0	0.0	122,216.07	368,800.47	48° 3' 26.470 N	103° 36' 9.410 W
6,000.0	0.00	0.00	6,000.0	0.0	0.0	122,216.07	368,800.47	48° 3' 26.470 N	103° 36' 9.410 W
6,100.0	0.00	0.00	6,100.0	0.0	0.0	122,216.07	368,800.47	48° 3' 26.470 N	103° 36' 9.410 W
6,156.0	0.00	0.00	6,156.0	0.0	0.0	122,216.07	368,800.47	48° 3' 26.470 N	103° 36' 9.410 W
Rierdon									
6,200.0	0.00	0.00	6,200.0	0.0	0.0	122,216.07	368,800.47	48° 3' 26.470 N	103° 36' 9.410 W
6,300.0	0.00	0.00	6,300.0	0.0	0.0	122,216.07	368,800.47	48° 3' 26.470 N	103° 36' 9.410 W
6,400.0	0.00	0.00	6,400.0	0.0	0.0	122,216.07	368,800.47	48° 3' 26.470 N	103° 36' 9.410 W
6,500.0	0.00	0.00	6,500.0	0.0	0.0	122,216.07	368,800.47	48° 3' 26.470 N	103° 36' 9.410 W
6,600.0	0.00	0.00	6,600.0	0.0	0.0	122,216.07	368,800.47	48° 3' 26.470 N	103° 36' 9.410 W
6,664.0	0.00	0.00	6,664.0	0.0	0.0	122,216.07	368,800.47	48° 3' 26.470 N	103° 36' 9.410 W
Dunham Salt									
6,700.0	0.00	0.00	6,700.0	0.0	0.0	122,216.07	368,800.47	48° 3' 26.470 N	103° 36' 9.410 W
6,738.0	0.00	0.00	6,738.0	0.0	0.0	122,216.07	368,800.47	48° 3' 26.470 N	103° 36' 9.410 W
Dunham Salt Base									
6,742.0	0.00	0.00	6,742.0	0.0	0.0	122,216.07	368,800.47	48° 3' 26.470 N	103° 36' 9.410 W
Spearfish									
6,800.0	0.00	0.00	6,800.0	0.0	0.0	122,216.07	368,800.47	48° 3' 26.470 N	103° 36' 9.410 W
6,900.0	0.00	0.00	6,900.0	0.0	0.0	122,216.07	368,800.47	48° 3' 26.470 N	103° 36' 9.410 W
7,000.0	0.00	0.00	7,000.0	0.0	0.0	122,216.07	368,800.47	48° 3' 26.470 N	103° 36' 9.410 W
7,058.0	0.00	0.00	7,058.0	0.0	0.0	122,216.07	368,800.47	48° 3' 26.470 N	103° 36' 9.410 W
Pine Salt									
7,100.0	0.00	0.00	7,100.0	0.0	0.0	122,216.07	368,800.47	48° 3' 26.470 N	103° 36' 9.410 W
7,129.0	0.00	0.00	7,129.0	0.0	0.0	122,216.07	368,800.47	48° 3' 26.470 N	103° 36' 9.410 W
Pine Salt Base									
7,173.0	0.00	0.00	7,173.0	0.0	0.0	122,216.07	368,800.47	48° 3' 26.470 N	103° 36' 9.410 W
Opeche Salt									
7,200.0	0.00	0.00	7,200.0	0.0	0.0	122,216.07	368,800.47	48° 3' 26.470 N	103° 36' 9.410 W
7,243.0	0.00	0.00	7,243.0	0.0	0.0	122,216.07	368,800.47	48° 3' 26.470 N	103° 36' 9.410 W
Opeche Salt Base									
7,300.0	0.00	0.00	7,300.0	0.0	0.0	122,216.07	368,800.47	48° 3' 26.470 N	103° 36' 9.410 W
7,383.0	0.00	0.00	7,383.0	0.0	0.0	122,216.07	368,800.47	48° 3' 26.470 N	103° 36' 9.410 W
Broom Creek									
7,400.0	0.00	0.00	7,400.0	0.0	0.0	122,216.07	368,800.47	48° 3' 26.470 N	103° 36' 9.410 W
7,436.0	0.00	0.00	7,436.0	0.0	0.0	122,216.07	368,800.47	48° 3' 26.470 N	103° 36' 9.410 W
Amsden (Top of Minnelusa Gp.)									
7,500.0	0.00	0.00	7,500.0	0.0	0.0	122,216.07	368,800.47	48° 3' 26.470 N	103° 36' 9.410 W
7,600.0	0.00	0.00	7,600.0	0.0	0.0	122,216.07	368,800.47	48° 3' 26.470 N	103° 36' 9.410 W
7,700.0	0.00	0.00	7,700.0	0.0	0.0	122,216.07	368,800.47	48° 3' 26.470 N	103° 36' 9.410 W
7,760.0	0.00	0.00	7,760.0	0.0	0.0	122,216.07	368,800.47	48° 3' 26.470 N	103° 36' 9.410 W
Tyler									
7,800.0	0.00	0.00	7,800.0	0.0	0.0	122,216.07	368,800.47	48° 3' 26.470 N	103° 36' 9.410 W
7,836.0	0.00	0.00	7,836.0	0.0	0.0	122,216.07	368,800.47	48° 3' 26.470 N	103° 36' 9.410 W
Otter (Base of Minnelusa Gp.)									
7,900.0	0.00	0.00	7,900.0	0.0	0.0	122,216.07	368,800.47	48° 3' 26.470 N	103° 36' 9.410 W
8,000.0	0.00	0.00	8,000.0	0.0	0.0	122,216.07	368,800.47	48° 3' 26.470 N	103° 36' 9.410 W
8,100.0	0.00	0.00	8,100.0	0.0	0.0	122,216.07	368,800.47	48° 3' 26.470 N	103° 36' 9.410 W
8,189.0	0.00	0.00	8,189.0	0.0	0.0	122,216.07	368,800.47	48° 3' 26.470 N	103° 36' 9.410 W
Kibbey									
8,200.0	0.00	0.00	8,200.0	0.0	0.0	122,216.07	368,800.47	48° 3' 26.470 N	103° 36' 9.410 W

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Well:	Chalmers 5300 31-19H	**North Reference:**	True
Wellbore:	OH	**Survey Calculation Method:**	Minimum Curvature
Design:	Plan #1	**Database:**	EDM Network

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (m)	Map Easting (m)	Latitude	Longitude
8,300.0	0.00	0.00	8,300.0	0.0	0.0	122,216.07	368,800.47	48° 3' 26.470 N	103° 36' 9.410 W
8,327.0	0.00	0.00	8,327.0	0.0	0.0	122,216.07	368,800.47	48° 3' 26.470 N	103° 36' 9.410 W
Charles Salt									
8,400.0	0.00	0.00	8,400.0	0.0	0.0	122,216.07	368,800.47	48° 3' 26.470 N	103° 36' 9.410 W
8,500.0	0.00	0.00	8,500.0	0.0	0.0	122,216.07	368,800.47	48° 3' 26.470 N	103° 36' 9.410 W
8,600.0	0.00	0.00	8,600.0	0.0	0.0	122,216.07	368,800.47	48° 3' 26.470 N	103° 36' 9.410 W
8,700.0	0.00	0.00	8,700.0	0.0	0.0	122,216.07	368,800.47	48° 3' 26.470 N	103° 36' 9.410 W
8,800.0	0.00	0.00	8,800.0	0.0	0.0	122,216.07	368,800.47	48° 3' 26.470 N	103° 36' 9.410 W
8,900.0	0.00	0.00	8,900.0	0.0	0.0	122,216.07	368,800.47	48° 3' 26.470 N	103° 36' 9.410 W
8,932.0	0.00	0.00	8,932.0	0.0	0.0	122,216.07	368,800.47	48° 3' 26.470 N	103° 36' 9.410 W
UB									
9,000.0	0.00	0.00	9,000.0	0.0	0.0	122,216.07	368,800.47	48° 3' 26.470 N	103° 36' 9.410 W
9,034.0	0.00	0.00	9,034.0	0.0	0.0	122,216.07	368,800.47	48° 3' 26.470 N	103° 36' 9.410 W
Base Last Salt									
9,074.0	0.00	0.00	9,074.0	0.0	0.0	122,216.07	368,800.47	48° 3' 26.470 N	103° 36' 9.410 W
Ratcliffe									
9,100.0	0.00	0.00	9,100.0	0.0	0.0	122,216.07	368,800.47	48° 3' 26.470 N	103° 36' 9.410 W
9,200.0	0.00	0.00	9,200.0	0.0	0.0	122,216.07	368,800.47	48° 3' 26.470 N	103° 36' 9.410 W
9,254.0	0.00	0.00	9,254.0	0.0	0.0	122,216.07	368,800.47	48° 3' 26.470 N	103° 36' 9.410 W
Mission Canyon									
9,300.0	0.00	0.00	9,300.0	0.0	0.0	122,216.07	368,800.47	48° 3' 26.470 N	103° 36' 9.410 W
9,400.0	0.00	0.00	9,400.0	0.0	0.0	122,216.07	368,800.47	48° 3' 26.470 N	103° 36' 9.410 W
9,500.0	0.00	0.00	9,500.0	0.0	0.0	122,216.07	368,800.47	48° 3' 26.470 N	103° 36' 9.410 W
9,600.0	0.00	0.00	9,600.0	0.0	0.0	122,216.07	368,800.47	48° 3' 26.470 N	103° 36' 9.410 W
9,700.0	0.00	0.00	9,700.0	0.0	0.0	122,216.07	368,800.47	48° 3' 26.470 N	103° 36' 9.410 W
9,800.0	0.00	0.00	9,800.0	0.0	0.0	122,216.07	368,800.47	48° 3' 26.470 N	103° 36' 9.410 W
9,816.0	0.00	0.00	9,816.0	0.0	0.0	122,216.07	368,800.47	48° 3' 26.470 N	103° 36' 9.410 W
Lodgepole									
9,900.0	0.00	0.00	9,900.0	0.0	0.0	122,216.07	368,800.47	48° 3' 26.470 N	103° 36' 9.410 W
10,000.0	0.00	0.00	10,000.0	0.0	0.0	122,216.07	368,800.47	48° 3' 26.470 N	103° 36' 9.410 W
10,079.0	0.00	0.00	10,079.0	0.0	0.0	122,216.07	368,800.47	48° 3' 26.470 N	103° 36' 9.410 W
Lodgepole Fracture Zone									
10,080.5	0.00	0.00	10,080.5	0.0	0.0	122,216.07	368,800.47	48° 3' 26.470 N	103° 36' 9.410 W
Start Build 12.00									
10,100.0	2.34	90.00	10,100.0	0.0	0.4	122,216.07	368,800.59	48° 3' 26.470 N	103° 36' 9.404 W
10,125.0	5.34	90.00	10,124.9	0.0	2.1	122,216.05	368,801.10	48° 3' 26.470 N	103° 36' 9.380 W
10,150.0	8.34	90.00	10,149.8	0.0	5.0	122,216.01	368,802.01	48° 3' 26.470 N	103° 36' 9.336 W
10,175.0	11.34	90.00	10,174.4	0.0	9.3	122,215.96	368,803.31	48° 3' 26.470 N	103° 36' 9.273 W
10,200.0	14.34	90.00	10,198.8	0.0	14.9	122,215.89	368,805.00	48° 3' 26.470 N	103° 36' 9.191 W
10,225.0	17.34	90.00	10,222.8	0.0	21.7	122,215.80	368,807.08	48° 3' 26.470 N	103° 36' 9.091 W
10,250.0	20.34	90.00	10,246.5	0.0	29.8	122,215.71	368,809.54	48° 3' 26.470 N	103° 36' 8.972 W
10,275.0	23.34	90.00	10,269.7	0.0	39.1	122,215.59	368,812.37	48° 3' 26.470 N	103° 36' 8.835 W
10,300.0	26.34	90.00	10,292.4	0.0	49.6	122,215.46	368,815.57	48° 3' 26.470 N	103° 36' 8.680 W
10,325.0	29.34	90.00	10,314.5	0.0	61.2	122,215.32	368,819.12	48° 3' 26.470 N	103° 36' 8.509 W
10,350.0	32.34	90.00	10,335.9	0.0	74.0	122,215.16	368,823.02	48° 3' 26.470 N	103° 36' 8.320 W
10,375.0	35.34	90.00	10,356.7	0.0	88.0	122,214.99	368,827.26	48° 3' 26.470 N	103° 36' 8.115 W
10,400.0	38.34	90.00	10,376.7	0.0	103.0	122,214.81	368,831.83	48° 3' 26.470 N	103° 36' 7.894 W
10,425.0	41.34	90.00	10,395.9	0.0	119.0	122,214.61	368,836.70	48° 3' 26.470 N	103° 36' 7.659 W
10,450.0	44.34	90.00	10,414.2	0.0	136.0	122,214.40	368,841.88	48° 3' 26.470 N	103° 36' 7.409 W
10,475.0	47.34	90.00	10,431.6	0.0	153.9	122,214.18	368,847.34	48° 3' 26.470 N	103° 36' 7.145 W
10,500.0	50.34	90.00	10,448.1	0.0	172.7	122,213.95	368,853.07	48° 3' 26.470 N	103° 36' 6.868 W
10,525.0	53.34	90.00	10,463.5	0.0	192.4	122,213.71	368,859.06	48° 3' 26.470 N	103° 36' 6.578 W
10,550.0	56.34	90.00	10,477.9	0.0	212.8	122,213.46	368,865.28	48° 3' 26.470 N	103° 36' 6.277 W
10,575.0	59.34	90.00	10,491.2	0.0	234.0	122,213.20	368,871.73	48° 3' 26.470 N	103° 36' 5.966 W

Company:	Oasis	**Local Co-ordinate Reference:**	Well Chalmers 5300 31-19H
Project:	McKenzie County, ND	**TVD Reference:**	WELL @ 1920.0ft (Original Well Elev)
Site:	Sec. 19 T153N R100W	**MD Reference:**	WELL @ 1920.0ft (Original Well Elev)
Well:	Chalmers 5300 31-19H	**North Reference:**	True
Wellbore:	OH	**Survey Calculation Method:**	Minimum Curvature
Design:	Plan #1	**Database:**	EDM Network

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (m)	Map Easting (m)	Latitude	Longitude
10,600.0	62.34	90.00	10,503.4	0.0	255.8	122,212.93	368,878.37	48° 3' 26.470 N	103° 36' 5.645 W
10,625.0	65.34	90.00	10,514.4	0.0	278.2	122,212.65	368,885.21	48° 3' 26.470 N	103° 36' 5.314 W
10,650.0	68.34	90.00	10,524.3	0.0	301.2	122,212.37	368,892.21	48° 3' 26.470 N	103° 36' 4.976 W
10,652.0	68.58	90.00	10,525.0	0.0	303.1	122,212.35	368,892.77	48° 3' 26.470 N	103° 36' 4.949 W
False Bakken									
10,675.0	71.34	90.00	10,532.9	0.0	324.7	122,212.08	368,899.35	48° 3' 26.470 N	103° 36' 4.630 W
10,678.5	71.76	90.00	10,534.0	0.0	328.0	122,212.04	368,900.37	48° 3' 26.470 N	103° 36' 4.581 W
Upper Bakken									
10,700.0	74.34	90.00	10,540.3	0.0	348.6	122,211.79	368,906.63	48° 3' 26.470 N	103° 36' 4.279 W
10,725.0	77.34	90.00	10,546.4	0.0	372.8	122,211.49	368,914.01	48° 3' 26.470 N	103° 36' 3.922 W
10,727.9	77.68	90.00	10,547.0	0.0	375.6	122,211.46	368,914.86	48° 3' 26.470 N	103° 36' 3.881 W
Middle Bakken									
10,750.0	80.34	90.00	10,551.2	0.0	397.3	122,211.19	368,921.48	48° 3' 26.470 N	103° 36' 3.561 W
10,775.0	83.34	90.00	10,554.8	0.0	422.1	122,210.89	368,929.01	48° 3' 26.470 N	103° 36' 3.197 W
10,800.0	86.34	90.00	10,557.0	0.0	447.0	122,210.58	368,936.60	48° 3' 26.470 N	103° 36' 2.830 W
10,827.4	89.62	90.00	10,558.0	0.0	474.3	122,210.25	368,944.92	48° 3' 26.470 N	103° 36' 2.428 W
Start 17.6 hold at 10827.4 MD									
10,829.9	89.62	90.00	10,558.0	0.0	476.9	122,210.22	368,945.70	48° 3' 26.470 N	103° 36' 2.390 W
Middle Bakken Sand Target									
10,845.0	89.62	90.00	10,558.1	0.0	491.9	122,210.03	368,950.29	48° 3' 26.470 N	103° 36' 2.168 W
Start 9446.3 hold at 10845.0 MD - 7"									
10,900.0	89.62	90.00	10,558.5	0.0	546.9	122,209.36	368,967.04	48° 3' 26.470 N	103° 36' 1.359 W
11,000.0	89.62	90.00	10,559.1	0.0	646.9	122,208.13	368,997.50	48° 3' 26.470 N	103° 35' 59.886 W
11,100.0	89.62	90.00	10,559.8	0.0	746.9	122,206.90	369,027.95	48° 3' 26.470 N	103° 35' 58.414 W
11,200.0	89.62	90.00	10,560.5	0.0	846.9	122,205.67	369,058.41	48° 3' 26.470 N	103° 35' 56.942 W
11,300.0	89.62	90.00	10,561.1	0.0	946.9	122,204.44	369,088.86	48° 3' 26.470 N	103° 35' 55.470 W
11,400.0	89.62	90.00	10,561.8	0.0	1,046.9	122,203.22	369,119.32	48° 3' 26.470 N	103° 35' 53.998 W
11,500.0	89.62	90.00	10,562.4	0.0	1,146.9	122,201.99	369,149.77	48° 3' 26.470 N	103° 35' 52.526 W
11,600.0	89.62	90.00	10,563.1	0.0	1,246.9	122,200.76	369,180.23	48° 3' 26.470 N	103° 35' 51.054 W
11,700.0	89.62	90.00	10,563.8	0.0	1,346.9	122,199.53	369,210.68	48° 3' 26.470 N	103° 35' 49.582 W
11,800.0	89.62	90.00	10,564.4	0.0	1,446.9	122,198.30	369,241.14	48° 3' 26.469 N	103° 35' 48.110 W
11,900.0	89.62	90.00	10,565.1	0.0	1,546.9	122,197.08	369,271.59	48° 3' 26.469 N	103° 35' 46.638 W
12,000.0	89.62	90.00	10,565.8	0.0	1,646.9	122,195.85	369,302.04	48° 3' 26.469 N	103° 35' 45.166 W
12,100.0	89.62	90.00	10,566.4	0.0	1,746.9	122,194.62	369,332.50	48° 3' 26.469 N	103° 35' 43.694 W
12,200.0	89.62	90.00	10,567.1	0.0	1,846.9	122,193.39	369,362.95	48° 3' 26.469 N	103° 35' 42.221 W
12,300.0	89.62	90.00	10,567.7	0.0	1,946.9	122,192.17	369,393.41	48° 3' 26.469 N	103° 35' 40.749 W
12,400.0	89.62	90.00	10,568.4	0.0	2,046.9	122,190.94	369,423.86	48° 3' 26.469 N	103° 35' 39.277 W
12,500.0	89.62	90.00	10,569.1	0.0	2,146.9	122,189.71	369,454.32	48° 3' 26.469 N	103° 35' 37.805 W
12,600.0	89.62	90.00	10,569.7	0.0	2,246.9	122,188.48	369,484.77	48° 3' 26.469 N	103° 35' 36.333 W
12,700.0	89.62	90.00	10,570.4	0.0	2,346.9	122,187.25	369,515.23	48° 3' 26.469 N	103° 35' 34.861 W
12,800.0	89.62	90.00	10,571.1	0.0	2,446.9	122,186.03	369,545.68	48° 3' 26.468 N	103° 35' 33.389 W
12,900.0	89.62	90.00	10,571.7	0.0	2,546.9	122,184.80	369,576.14	48° 3' 26.468 N	103° 35' 31.917 W
13,000.0	89.62	90.00	10,572.4	0.0	2,646.9	122,183.57	369,606.59	48° 3' 26.468 N	103° 35' 30.445 W
13,100.0	89.62	90.00	10,573.1	0.0	2,746.9	122,182.34	369,637.04	48° 3' 26.468 N	103° 35' 28.973 W
13,200.0	89.62	90.00	10,573.7	0.0	2,846.9	122,181.11	369,667.50	48° 3' 26.468 N	103° 35' 27.501 W
13,300.0	89.62	90.00	10,574.4	0.0	2,946.9	122,179.89	369,697.95	48° 3' 26.468 N	103° 35' 26.029 W
13,400.0	89.62	90.00	10,575.0	0.0	3,046.9	122,178.66	369,728.41	48° 3' 26.468 N	103° 35' 24.557 W
13,500.0	89.62	90.00	10,575.7	0.0	3,146.9	122,177.43	369,758.86	48° 3' 26.467 N	103° 35' 23.084 W
13,600.0	89.62	90.00	10,576.4	0.0	3,246.9	122,176.20	369,789.32	48° 3' 26.467 N	103° 35' 21.612 W
13,700.0	89.62	90.00	10,577.0	0.0	3,346.9	122,174.98	369,819.77	48° 3' 26.467 N	103° 35' 20.140 W
13,800.0	89.62	90.00	10,577.7	0.0	3,446.9	122,173.75	369,850.23	48° 3' 26.467 N	103° 35' 18.668 W
13,900.0	89.62	90.00	10,578.4	0.0	3,546.9	122,172.52	369,880.68	48° 3' 26.467 N	103° 35' 17.196 W
14,000.0	89.62	90.00	10,579.0	0.0	3,646.9	122,171.29	369,911.14	48° 3' 26.466 N	103° 35' 15.724 W
14,100.0	89.62	90.00	10,579.7	0.0	3,746.9	122,170.06	369,941.59	48° 3' 26.466 N	103° 35' 14.252 W

Company:	Oasis	**Local Co-ordinate Reference:**	Well Chalmers 5300 31-19H
Project:	McKenzie County, ND	**TVD Reference:**	WELL @ 1920.0ft (Original Well Elev)
Site:	Sec. 19 T153N R100W	**MD Reference:**	WELL @ 1920.0ft (Original Well Elev)
Well:	Chalmers 5300 31-19H	**North Reference:**	True
Wellbore:	OH	**Survey Calculation Method:**	Minimum Curvature
Design:	Plan #1	**Database:**	EDM Network

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (m)	Map Easting (m)	Latitude	Longitude
14,200.0	89.62	90.00	10,580.4	0.0	3,846.9	122,168.84	369,972.05	48° 3' 26.466 N	103° 35' 12.780 W
14,300.0	89.62	90.00	10,581.0	0.0	3,946.9	122,167.61	370,002.50	48° 3' 26.466 N	103° 35' 11.308 W
14,400.0	89.62	90.00	10,581.7	0.0	4,046.9	122,166.38	370,032.95	48° 3' 26.466 N	103° 35' 9.836 W
14,500.0	89.62	90.00	10,582.3	0.0	4,146.9	122,165.15	370,063.41	48° 3' 26.465 N	103° 35' 8.364 W
14,600.0	89.62	90.00	10,583.0	0.0	4,246.9	122,163.93	370,093.86	48° 3' 26.465 N	103° 35' 6.892 W
14,700.0	89.62	90.00	10,583.7	0.0	4,346.9	122,162.70	370,124.32	48° 3' 26.465 N	103° 35' 5.420 W
14,800.0	89.62	90.00	10,584.3	0.0	4,446.8	122,161.47	370,154.77	48° 3' 26.465 N	103° 35' 3.947 W
14,900.0	89.62	90.00	10,585.0	0.0	4,546.8	122,160.24	370,185.23	48° 3' 26.465 N	103° 35' 2.475 W
15,000.0	89.62	90.00	10,585.7	0.0	4,646.8	122,159.01	370,215.68	48° 3' 26.464 N	103° 35' 1.003 W
15,100.0	89.62	90.00	10,586.3	0.0	4,746.8	122,157.79	370,246.14	48° 3' 26.464 N	103° 34' 59.531 W
15,200.0	89.62	90.00	10,587.0	0.0	4,846.8	122,156.56	370,276.59	48° 3' 26.464 N	103° 34' 58.059 W
15,300.0	89.62	90.00	10,587.6	0.0	4,946.8	122,155.33	370,307.05	48° 3' 26.464 N	103° 34' 56.587 W
15,400.0	89.62	90.00	10,588.3	0.0	5,046.8	122,154.10	370,337.50	48° 3' 26.463 N	103° 34' 55.115 W
15,500.0	89.62	90.00	10,589.0	0.0	5,146.8	122,152.87	370,367.95	48° 3' 26.463 N	103° 34' 53.643 W
15,600.0	89.62	90.00	10,589.6	0.0	5,246.8	122,151.65	370,398.41	48° 3' 26.463 N	103° 34' 52.171 W
15,700.0	89.62	90.00	10,590.3	0.0	5,346.8	122,150.42	370,428.86	48° 3' 26.462 N	103° 34' 50.699 W
15,800.0	89.62	90.00	10,591.0	0.0	5,446.8	122,149.19	370,459.32	48° 3' 26.462 N	103° 34' 49.227 W
15,900.0	89.62	90.00	10,591.6	0.0	5,546.8	122,147.96	370,489.77	48° 3' 26.462 N	103° 34' 47.755 W
16,000.0	89.62	90.00	10,592.3	0.0	5,646.8	122,146.74	370,520.23	48° 3' 26.462 N	103° 34' 46.282 W
16,100.0	89.62	90.00	10,593.0	0.0	5,746.8	122,145.51	370,550.68	48° 3' 26.461 N	103° 34' 44.810 W
16,200.0	89.62	90.00	10,593.6	0.0	5,846.8	122,144.28	370,581.14	48° 3' 26.461 N	103° 34' 43.338 W
16,300.0	89.62	90.00	10,594.3	0.0	5,946.8	122,143.05	370,611.59	48° 3' 26.461 N	103° 34' 41.866 W
16,400.0	89.62	90.00	10,594.9	0.0	6,046.8	122,141.82	370,642.05	48° 3' 26.460 N	103° 34' 40.394 W
16,500.0	89.62	90.00	10,595.6	0.0	6,146.8	122,140.60	370,672.50	48° 3' 26.460 N	103° 34' 38.922 W
16,600.0	89.62	90.00	10,596.3	0.0	6,246.8	122,139.37	370,702.96	48° 3' 26.460 N	103° 34' 37.450 W
16,700.0	89.62	90.00	10,596.9	0.0	6,346.8	122,138.14	370,733.41	48° 3' 26.459 N	103° 34' 35.978 W
16,800.0	89.62	90.00	10,597.6	0.0	6,446.8	122,136.91	370,763.86	48° 3' 26.459 N	103° 34' 34.506 W
16,900.0	89.62	90.00	10,598.3	0.0	6,546.8	122,135.68	370,794.32	48° 3' 26.459 N	103° 34' 33.034 W
17,000.0	89.62	90.00	10,598.9	0.0	6,646.8	122,134.46	370,824.77	48° 3' 26.458 N	103° 34' 31.562 W
17,100.0	89.62	90.00	10,599.6	0.0	6,746.8	122,133.23	370,855.23	48° 3' 26.458 N	103° 34' 30.090 W
17,200.0	89.62	90.00	10,600.2	0.0	6,846.8	122,132.00	370,885.68	48° 3' 26.458 N	103° 34' 28.618 W
17,300.0	89.62	90.00	10,600.9	0.0	6,946.8	122,130.77	370,916.14	48° 3' 26.457 N	103° 34' 27.145 W
17,400.0	89.62	90.00	10,601.6	0.0	7,046.8	122,129.55	370,946.59	48° 3' 26.457 N	103° 34' 25.673 W
17,500.0	89.62	90.00	10,602.2	0.0	7,146.8	122,128.32	370,977.05	48° 3' 26.457 N	103° 34' 24.201 W
17,600.0	89.62	90.00	10,602.9	0.0	7,246.8	122,127.09	371,007.50	48° 3' 26.456 N	103° 34' 22.729 W
17,700.0	89.62	90.00	10,603.6	0.0	7,346.8	122,125.86	371,037.96	48° 3' 26.456 N	103° 34' 21.257 W
17,800.0	89.62	90.00	10,604.2	0.0	7,446.8	122,124.63	371,068.41	48° 3' 26.455 N	103° 34' 19.785 W
17,900.0	89.62	90.00	10,604.9	0.0	7,546.8	122,123.41	371,098.86	48° 3' 26.455 N	103° 34' 18.313 W
18,000.0	89.62	90.00	10,605.6	0.0	7,646.8	122,122.18	371,129.32	48° 3' 26.455 N	103° 34' 16.841 W
18,100.0	89.62	90.00	10,606.2	0.0	7,746.8	122,120.95	371,159.77	48° 3' 26.454 N	103° 34' 15.369 W
18,200.0	89.62	90.00	10,606.9	0.0	7,846.8	122,119.72	371,190.23	48° 3' 26.454 N	103° 34' 13.897 W
18,300.0	89.62	90.00	10,607.5	0.0	7,946.8	122,118.49	371,220.68	48° 3' 26.453 N	103° 34' 12.425 W
18,400.0	89.62	90.00	10,608.2	0.0	8,046.8	122,117.27	371,251.14	48° 3' 26.453 N	103° 34' 10.953 W
18,500.0	89.62	90.00	10,608.9	0.0	8,146.8	122,116.04	371,281.59	48° 3' 26.453 N	103° 34' 9.481 W
18,600.0	89.62	90.00	10,609.5	0.0	8,246.8	122,114.81	371,312.05	48° 3' 26.452 N	103° 34' 8.008 W
18,700.0	89.62	90.00	10,610.2	0.0	8,346.8	122,113.58	371,342.50	48° 3' 26.452 N	103° 34' 6.536 W
18,800.0	89.62	90.00	10,610.9	0.0	8,446.8	122,112.36	371,372.96	48° 3' 26.451 N	103° 34' 5.064 W
18,900.0	89.62	90.00	10,611.5	0.0	8,546.8	122,111.13	371,403.41	48° 3' 26.451 N	103° 34' 3.592 W
19,000.0	89.62	90.00	10,612.2	0.0	8,646.8	122,109.90	371,433.87	48° 3' 26.450 N	103° 34' 2.120 W
19,100.0	89.62	90.00	10,612.8	0.0	8,746.8	122,108.67	371,464.32	48° 3' 26.450 N	103° 34' 0.648 W
19,200.0	89.62	90.00	10,613.5	0.0	8,846.8	122,107.44	371,494.77	48° 3' 26.449 N	103° 33' 59.176 W
19,300.0	89.62	90.00	10,614.2	0.0	8,946.7	122,106.22	371,525.23	48° 3' 26.449 N	103° 33' 57.704 W
19,400.0	89.62	90.00	10,614.8	0.0	9,046.7	122,104.99	371,555.68	48° 3' 26.449 N	103° 33' 56.232 W
19,500.0	89.62	90.00	10,615.5	0.0	9,146.7	122,103.76	371,586.14	48° 3' 26.448 N	103° 33' 54.760 W
19,600.0	89.62	90.00	10,616.2	0.0	9,246.7	122,102.53	371,616.59	48° 3' 26.448 N	103° 33' 53.288 W

Survey Report - Geographic

Company:	Oasis	**Local Co-ordinate Reference:**	Well Chalmers 5300 31-19H
Project:	McKenzie County, ND	**TVD Reference:**	WELL @ 1920.0ft (Original Well Elev)
Site:	Sec. 19 T153N R100W	**MD Reference:**	WELL @ 1920.0ft (Original Well Elev)
Well:	Chalmers 5300 31-19H	**North Reference:**	True
Wellbore:	OH	**Survey Calculation Method:**	Minimum Curvature
Design:	Plan #1	**Database:**	EDM Network

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (m)	Map Easting (m)	Latitude	Longitude
19,700.0	89.62	90.00	10,616.8	0.0	9,346.7	122,101.30	371,647.05	48° 3' 26.447 N	103° 33' 51.816 W
19,800.0	89.62	90.00	10,617.5	0.0	9,446.7	122,100.08	371,677.50	48° 3' 26.447 N	103° 33' 50.343 W
19,900.0	89.62	90.00	10,618.2	0.0	9,546.7	122,098.85	371,707.96	48° 3' 26.446 N	103° 33' 48.871 W
20,000.0	89.62	90.00	10,618.8	0.0	9,646.7	122,097.62	371,738.41	48° 3' 26.446 N	103° 33' 47.399 W
20,100.0	89.62	90.00	10,619.5	0.0	9,746.7	122,096.39	371,768.87	48° 3' 26.445 N	103° 33' 45.927 W
20,200.0	89.62	90.00	10,620.1	0.0	9,846.7	122,095.17	371,799.32	48° 3' 26.445 N	103° 33' 44.455 W
20,291.3	89.62	90.00	10,620.7	0.0	9,938.0	122,094.05	371,827.12	48° 3' 26.444 N	103° 33' 43.112 W
TD at 20291.3									

Design Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (m)	Easting (m)	Latitude	Longitude
Interp @ 10558.0 (Chalr - plan hits target center - Point	0.00	0.00	10,558.1	0.0	491.9	122,210.03	368,950.29	48° 3' 26.470 N	103° 36' 2.168 W
Chalmers 5300 31-19H l - plan misses target center by 0.3ft at 20291.3ft MD (10620.7 TVD, 0.0 N, 9938.0 E) - Point	0.00	0.00	10,621.0	0.0	9,938.0	122,094.05	371,827.12	48° 3' 26.444 N	103° 33' 43.112 W

Casing Points

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (in)	Hole Diameter (in)
1,880.0	1,880.0	9 5/8"	9.625	13.500
10,845.0	10,558.1	7"	7.000	8.750

Company:	Oasis	**Local Co-ordinate Reference:**	Well Chalmers 5300 31-19H
Project:	McKenzie County, ND	**TVD Reference:**	WELL @ 1920.0ft (Original Well Elev)
Site:	Sec. 19 T153N R100W	**MD Reference:**	WELL @ 1920.0ft (Original Well Elev)
Well:	Chalmers 5300 31-19H	**North Reference:**	True
Wellbore:	OH	**Survey Calculation Method:**	Minimum Curvature
Design:	Plan #1	**Database:**	EDM Network

Formations

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
1,780.0	1,780.0	Pierre			
4,382.0	4,382.0	Greenhorn			
4,795.0	4,795.0	Mowry			
5,208.0	5,208.0	Dakota			
6,156.0	6,156.0	Rierdon			
6,664.0	6,664.0	Dunham Salt			
6,738.0	6,738.0	Dunham Salt Base			
6,742.0	6,742.0	Spearfish			
7,058.0	7,058.0	Pine Salt			
7,129.0	7,129.0	Pine Salt Base			
7,173.0	7,173.0	Opeche Salt			
7,243.0	7,243.0	Opeche Salt Base			
7,383.0	7,383.0	Broom Creek			
7,436.0	7,436.0	Amsden (Top of Minnelusa Gp.)			
7,760.0	7,760.0	Tyler			
7,836.0	7,836.0	Otter (Base of Minnelusa Gp.)			
8,189.0	8,189.0	Kibbey			
8,327.0	8,327.0	Charles Salt			
8,932.0	8,932.0	UB			
9,034.0	9,034.0	Base Last Salt			
9,074.0	9,074.0	Ratcliffe			
9,254.0	9,254.0	Mission Canyon			
9,816.0	9,816.0	Lodgepole			
10,079.0	10,079.0	Lodgepole Fracture Zone			
10,652.0	10,525.0	False Bakken			
10,678.5	10,534.0	Upper Bakken			
10,727.9	10,547.0	Middle Bakken			
10,829.9	10,558.0	Middle Bakken Sand Target			

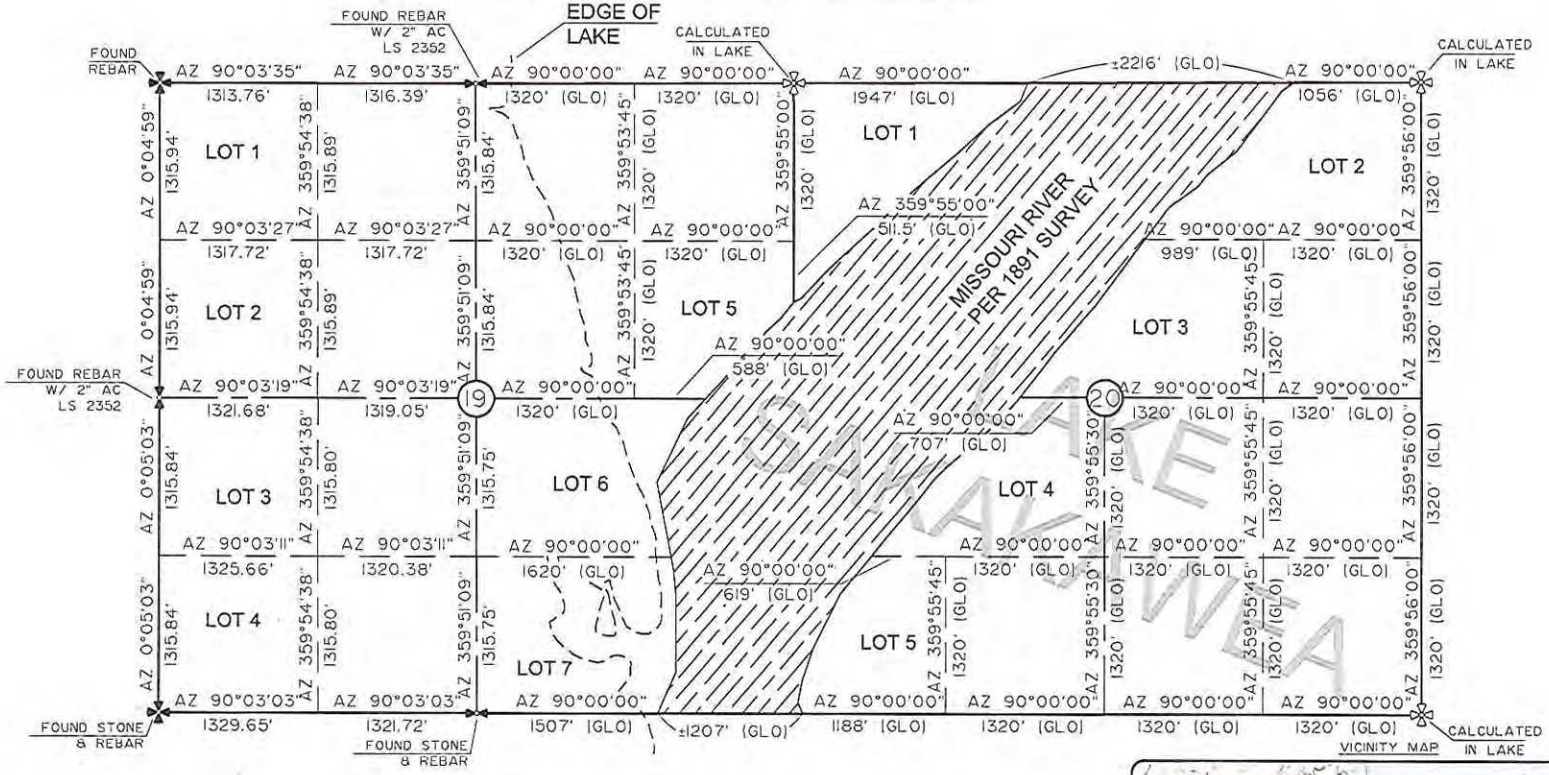
Plan Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates +N/-S (ft)	Local Coordinates +E/-W (ft)	Comment
10,081	10,081	0	0	Start Build 12.00
10,827	10,558	0	474	Start 17.6 hold at 10827.4 MD
10,845	10,558	0	492	Start 9446.3 hold at 10845.0 MD
20,291	10,621	0	9938	TD at 20291.3

Checked By: _____ Approved By: _____ Date: _____

SECTION BREAKDOWN

OASIS PETROLEUM NORTH AMERICA, LLC
1001 FANNIN, SUITE 202 HOUSTON, TX 77002
"CHALMERS 5300 31-19H"
1535 FEET FROM SOUTH LINE AND 375 FEET FROM WEST LINE
SECTION 19, T153N, R100W, 5th P.M., MCKENZIE COUNTY, NORTH DAKOTA



ALL AZIMUTHS ARE BASED ON G.P.S. DERIVED BEARINGS. 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.

REGISTERED LAND SURVEYOR
ROBERT L. PROVOST
LS-2884
DATE: 9/30/10
NORTH DAKOTA

0 1000
1" = 1000'

- MONUMENT - RECOVERED
- MONUMENT - NOT RECOVERED

Revision No.	Date	By	Description

OASIS PETROLEUM NORTH AMERICA, LLC
SECTION BREAKDOWN
SECTIONS 19 & 20, T153N, R100W
MCKENZIE COUNTY, NORTH DAKOTA
Drawn By: JJS | Project No.: S-09-03-93
Checked By: ALH/RLP | Date: SEPT 2010

Interstate Engineering, Inc.
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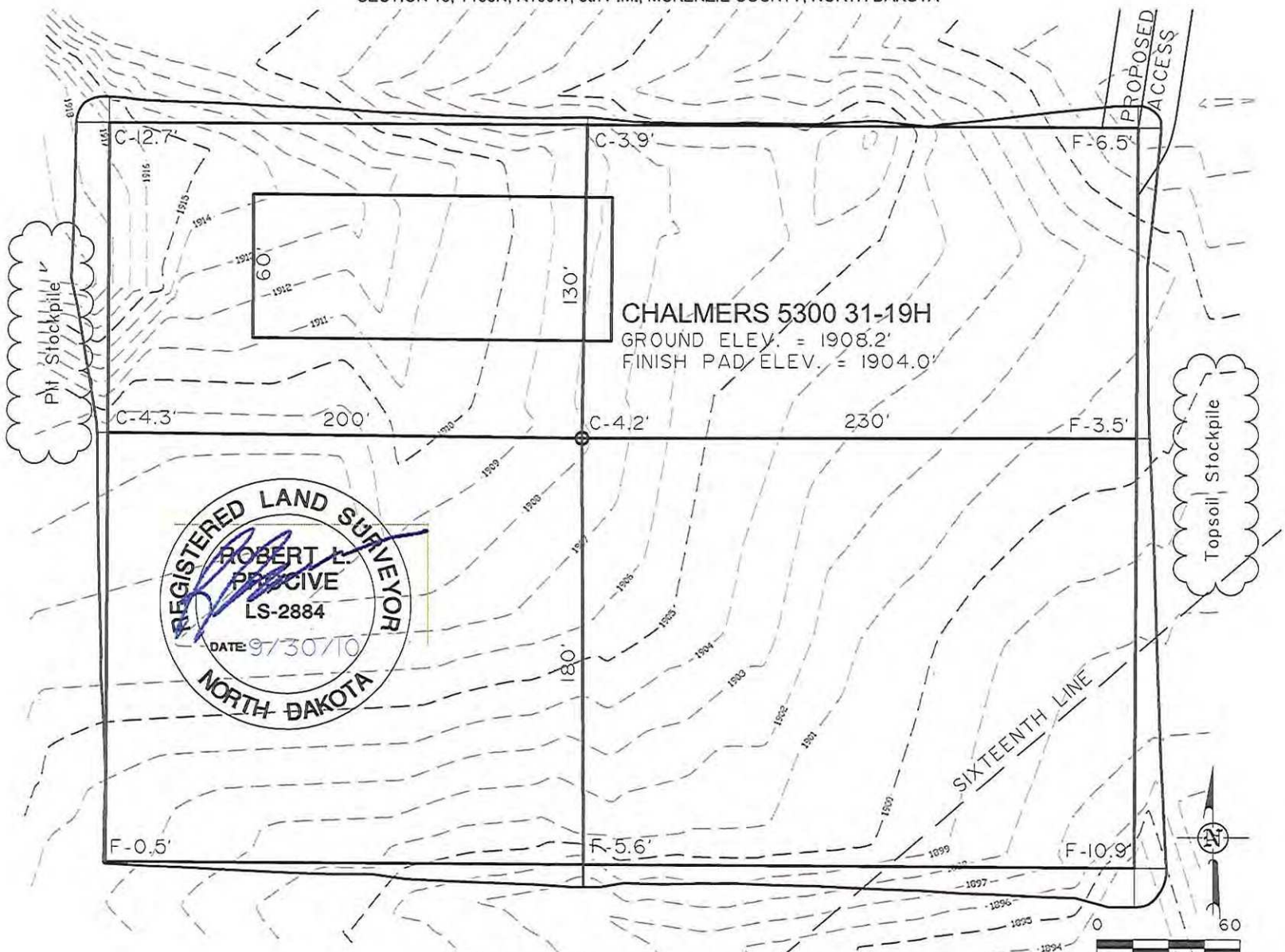
SHEET NO. 2

PAD LAYOUT

OASIS PETROLEUM NORTH AMERICA, LLC
1001 FANNIN, SUITE 202 HOUSTON, TX 77002
"CHALMERS 5300 31-19H"
1535 FEET FROM SOUTH LINE AND 375 FEET FROM WEST LINE
SECTION 19, T153N, R100W, 5th P.M., MCKENZIE COUNTY, NORTH DAKOTA



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

Revision No.	Date	By	Description

OASIS PETROLEUM NORTH AMERICA, LLC
PAD LAYOUT
SECTION 19, T153N, R100W
MCKENZIE COUNTY, NORTH DAKOTA

Drawn By: J.I.S. | Project No.: S103-153
Checked By: A.J.H. R.L.P. | Date: SEPT. 2010

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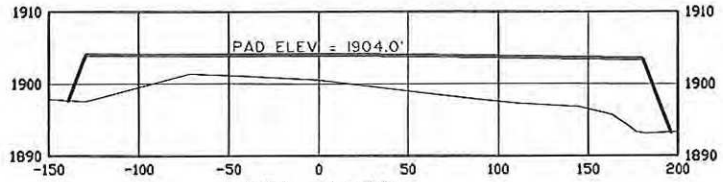
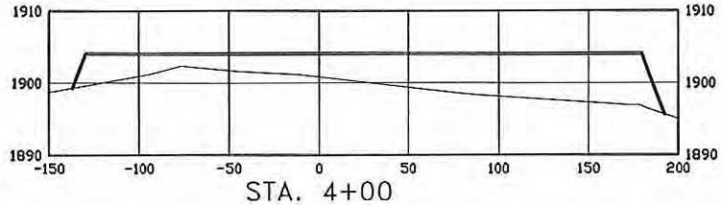
SHEET NO. 3

CROSS SECTIONS

OASIS PETROLEUM NORTH AMERICA, LLC
1001 FANNIN, SUITE 202 HOUSTON, TX 77002
"CHALMERS 5300 31-19H"
1535 FEET FROM SOUTH LINE AND 375 FEET FROM WEST LINE
SECTION 19, T153N, R100W, 5th P.M., MCKENZIE COUNTY, NORTH DAKOTA



STA. 4+30



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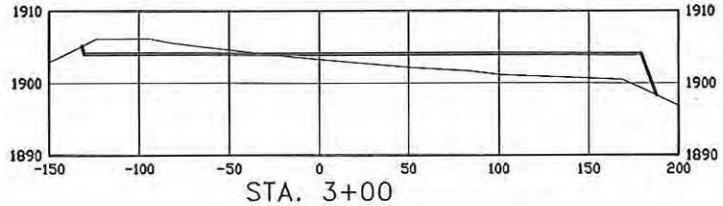

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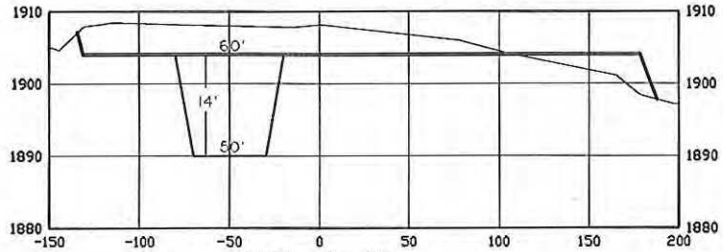

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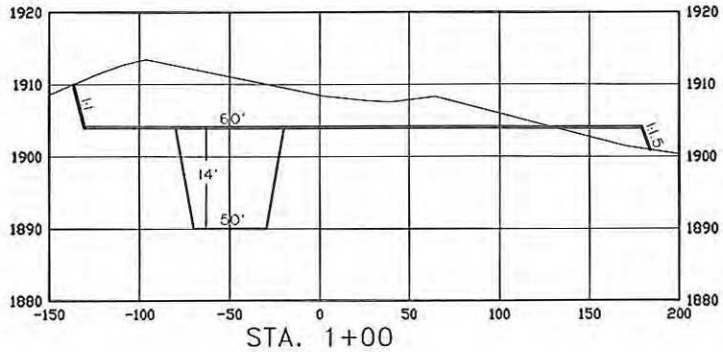

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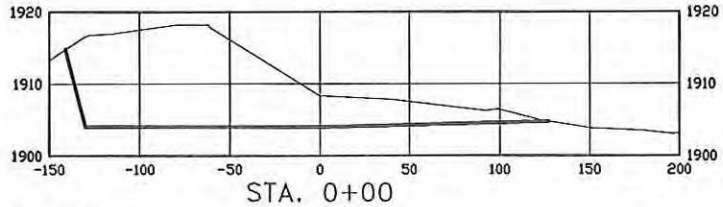

STA. 0+00

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

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OASIS PETROLEUM NORTH AMERICA, LLC
PAD CROSS SECTIONS
SECTION 19, T153N, R100W
MCKENZIE COUNTY, ND

Drawn By: J.J.S. | Project No.: S10-9-163
Checked By: R.L.P. | Date: SEPT. 2010

Revision No.	Date	By	Description

WELL LOCATION SITE QUANTITIES

OASIS PETROLEUM NORTH AMERICA, LLC
1001 FANNIN, SUITE 202 HOUSTON, TX 77002
"CHALMERS 5300 31-19H"
1535 FEET FROM SOUTH LINE AND 375 FEET FROM WEST LINE
SECTION 19, T153N, R100W, 5th P.M., MCKENZIE COUNTY, NORTH DAKOTA

WELL SITE ELEVATION	1908.2
WELL PAD ELEVATION	1904.0

EXCAVATION	12,109
PLUS PIT	3,150
	15,259
EMBANKMENT	6,737
PLUS SHRINKAGE (15%)	2,021
	8,758
STOCKPILE PIT	3,150
STOCKPILE TOP SOIL (6")	2,655
STOCKPILE MATERIAL	696
DISTURBED AREA FROM PAD	3.29 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
1535' FSL
375' FWL

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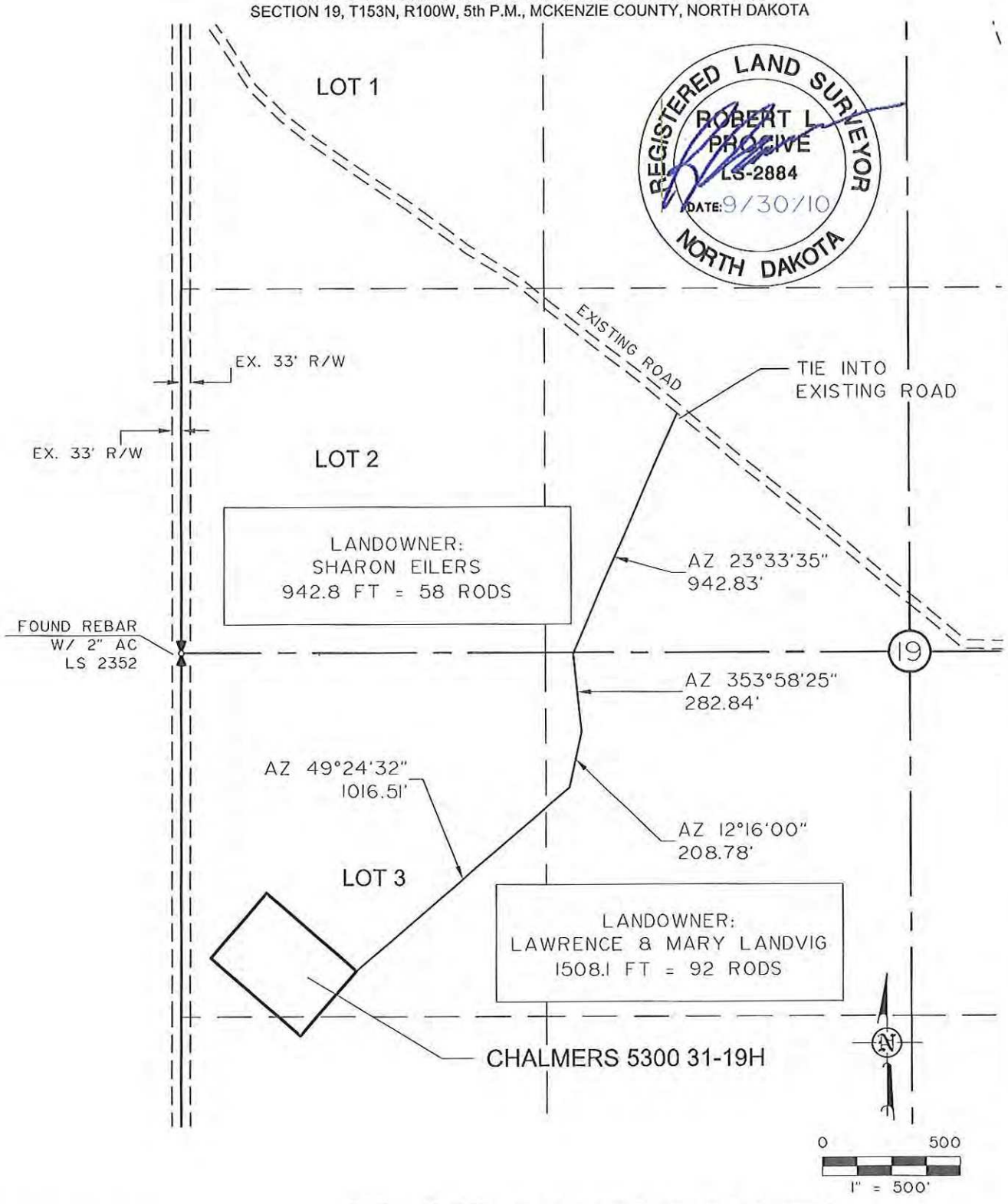
OASIS PETROLEUM, LLC
QUANTITIES
SECTION 19, T153N, R100W
MCKENZIE COUNTY, ND
Drawn By: J.J.S. | Project No.: S10-09-163
Checked By: A.J.H./R.L.P. | Date: SEPT. 2010

Revision No.	Date	By	Description

ACCESS APPROACH

OASIS PETROLEUM NORTH AMERICA, LLC
1001 FANNIN, SUITE 202 HOUSTON, TX 77002
"CHALMERS 5300 31-19H"
1535 FEET FROM SOUTH LINE AND 375 FEET FROM WEST LINE
SECTION 19, T153N, R100W, 5th P.M., MCKENZIE COUNTY, NORTH DAKOTA



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

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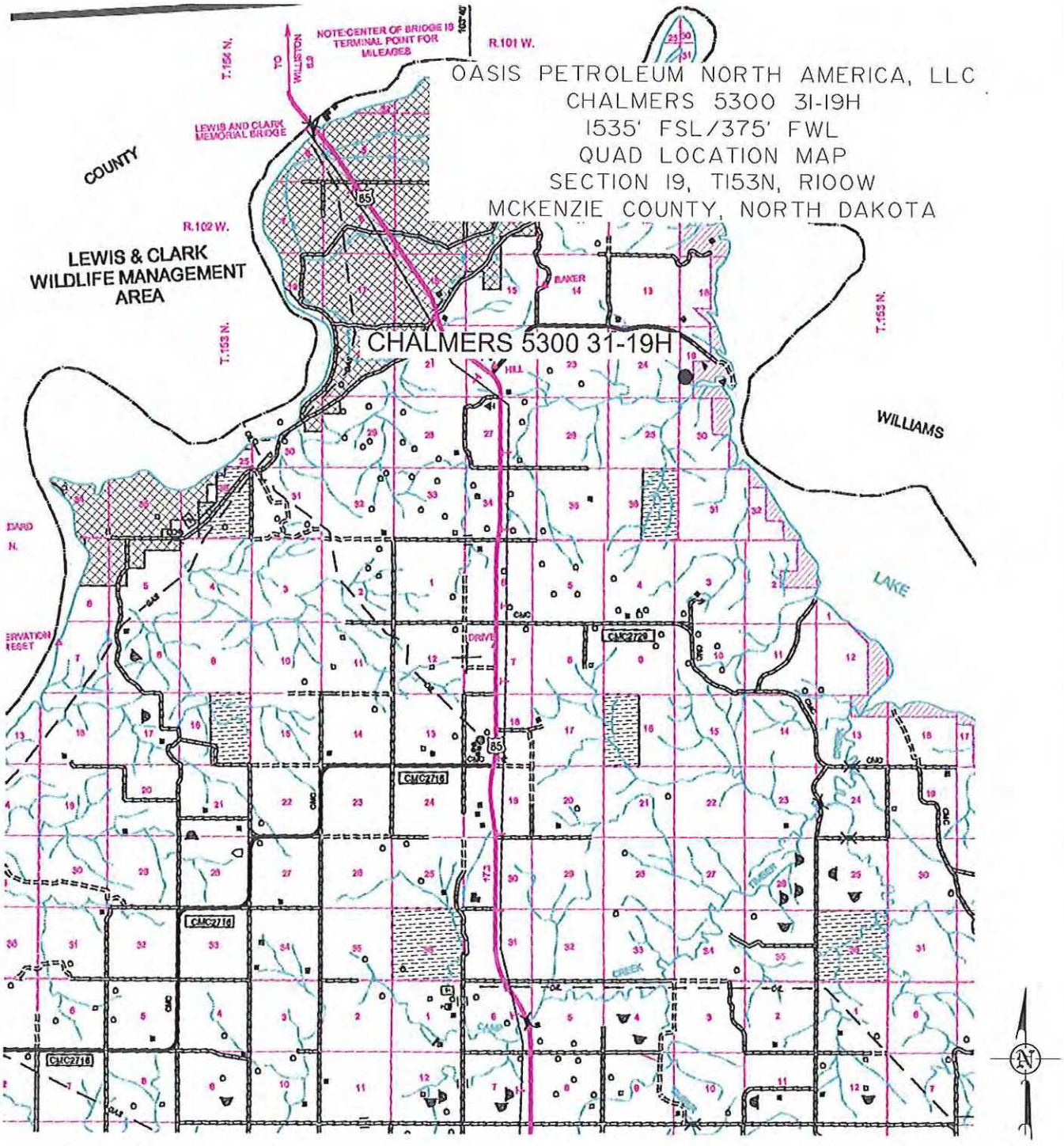
COUNTY ROAD MAP

OASIS PETROLEUM NORTH AMERICA, LLC
1001 FANNIN, SUITE 202 HOUSTON, TX 77002
"CHALMERS 5300 31-19H"
1535 FEET FROM SOUTH LINE AND 375 FEET FROM WEST LINE
SECTION 19, T153N, R100W, 5th P.M., MCKENZIE COUNTY, NORTH DAKOTA



SCALE: 1" = 2 MILE

6	INTERSTATE ENGINEERING	Interstate Engineering, Inc. P.O. Box 648 425 East Main Street Sidney, Montana 59270 Ph (406) 433-5617 Fax (406) 433-5618 www.lengl.com Other offices in Minnesota, North Dakota and South Dakota	OASIS PETROLEUM NORTH AMERICA, LLC COUNTY ROAD MAP SECTION 19, T153N, R100W MCKENZIE COUNTY, NORTH DAKOTA Drawn By: J.J.S. Project No: S10-09-163 Checked By: A.J.H./R.L.P. Date: SEPT. 2010

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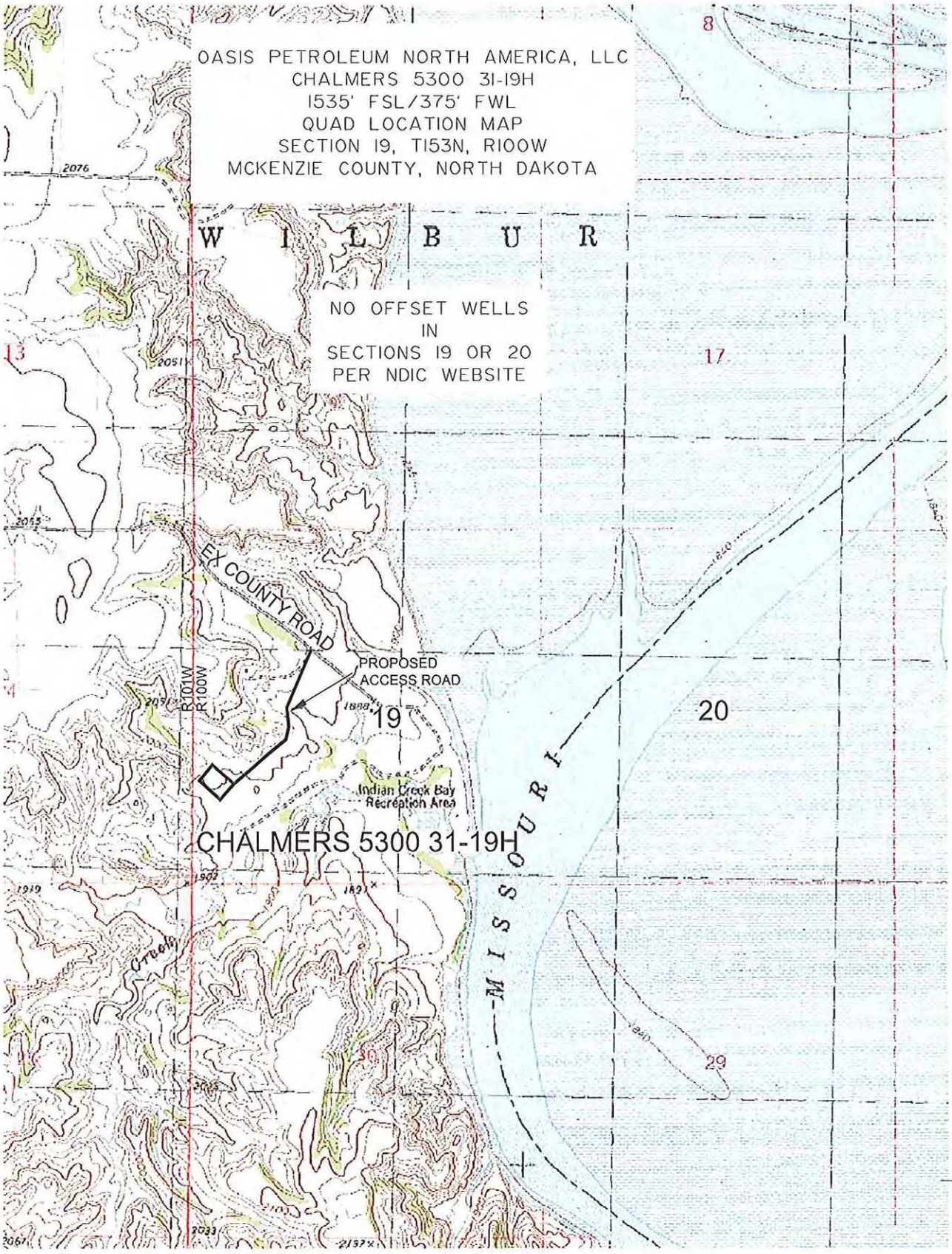

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OASIS PETROLEUM NORTH AMERICA, LLC
QUAD LOCATION MAP
SECTION 19, T153N, R100W
MCKENZIE COUNTY, NORTH DAKOTA

Drawn By: J.J.S. | Project No.: S10-09-163
Checked By: A.J.H/R.L.P. | Date: SEPT. 2010

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