



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.
28648



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

Notice of Intent

Approximate Start Date

Report of Work Done

Date Work Completed

August 6, 2015

Notice of Intent to Begin a Workover Project that may Qualify
for a Tax Exemption Pursuant to NDCC Section 57-51.1-03.

Approximate Start Date

Drilling Prognosis

Spill Report

Redrilling or Repair

Shooting

Casing or Liner

Acidizing

Plug Well

Fracture Treatment

Supplemental History

Change Production Method

Temporarily Abandon

Reclamation

Other

Well is now on pump

Well Name and Number

Chalmers 5300 21-19 9B

Footages	Qtr-Qtr	Section	Township	Range
2259 F N L	327 F W L	LOT2	19	153 N 100 W
Field Baker	Pool Bakken		County McKenzie	

24-HOUR PRODUCTION RATE

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

Name of Contractor(s)

Address

City

State

Zip Code

DETAILS OF WORK

Effective 08/06/2015 the above referenced well is on pump.

End of Tubing: 2-7/8" L-80 tubing @ 10155'

Pump: ESP @ 9981.66'

Company Oasis Petroleum North America LLC	Telephone Number 281-404-9436
---	---

Address 1001 Fannin, Suite 1500

City Houston	State TX	Zip Code 77002
------------------------	--------------------	--------------------------

Signature	Printed Name Jennifer Swenson
-----------	---

Title Regulatory Specialist	Date October 14, 2015
---------------------------------------	---------------------------------

Email Address jswenson@oasispetroleum.com

FOR STATE USE ONLY

<input checked="" type="checkbox"/> Received	<input type="checkbox"/> Approved
Date <i>10/26/2015</i>	
By <i>Taylor Roth</i>	
Title TAYLOR ROTH	
Engineering Technician	



AUTHORIZATION TO PURCHASE AND TRANSPORT OIL FROM LEASE - Form 8

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



Well File No.

28648

NDIC CTB No.

To be assigned

228633

PLEASE READ INSTRUCTIONS BEFORE FILLING OUT FORM.

PLEASE SUBMIT THE ORIGINAL AND FOUR COPIES.

Well Name and Number CHALMERS 5300 21-19 9B	Qtr-Qtr LOT2	Section 19	Township 153	Range 100	County McKenzie
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Operator Oasis Petroleum North America LLC	Telephone Number (281) 404-9573	Field BAKER
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Address 1001 Fannin, Suite 1500	City Houston	State TX	Zip Code 77002
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Name of First Purchaser Oasis Petroleum Marketing LLC	Telephone Number (281) 404-9627	% Purchased 100%	Date Effective May 1, 2015
Principal Place of Business 1001 Fannin, Suite 1500	City Houston	State TX	Zip Code 77002
Field Address	City	State	Zip Code
Transporter Hiland Crude, LLC	Telephone Number (580) 616-2058	% Transported 75%	Date Effective May 1, 2015
Address P.O. Box 3886	City Enid	State OK	Zip Code 73702

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

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

I hereby swear or affirm that the information provided is true, complete and correct as determined from all available records.	Date September 10, 2015
Signature 	Printed Name Dina Barron Title Mktg. Contracts Administrator

Above Signature Witnessed By:	Printed Name	Title
Signature 	Printed Name Jeremy Harris	Title Marketing Scheduler

FOR STATE USE ONLY

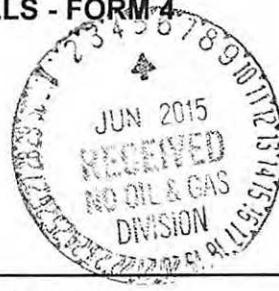
Date Approved SEP 18 2015
By
Title Oil & Gas Production Analyst

Oil & Gas Production Analyst



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.

28633TA
28634TA
28635
28636TA
28648TA
28637TA
28649TA

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

<input type="checkbox"/> Notice of Intent	Approximate Start Date
<input checked="" type="checkbox"/> Report of Work Done	Date Work Completed March 14, 2015
<input type="checkbox"/> 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	

<input type="checkbox"/> Drilling Prognosis	<input type="checkbox"/> Spill Report
<input type="checkbox"/> Redrilling or Repair	<input type="checkbox"/> Shooting
<input type="checkbox"/> Casing or Liner	<input type="checkbox"/> Acidizing
<input type="checkbox"/> Plug Well	<input type="checkbox"/> Fracture Treatment
<input type="checkbox"/> Supplemental History	<input type="checkbox"/> Change Production Method
<input type="checkbox"/> Temporarily Abandon	<input checked="" type="checkbox"/> Reclamation
<input type="checkbox"/> Other	Reserve pit reclamation

Well Name and Number
See below

Footages	F	N	L	F	E	L	Qtr-Qtr	Section	Township	Range
							LOT2	19	153 N	100 W
Field Baker	Pool Bakken				County McKenzie					

24-HOUR PRODUCTION RATE

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

Name of Contractor(s)
Neu Construction

Address 602 W. 9th Street	City Fairview	State MT	Zip Code 59221
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DETAILS OF WORK

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

Chalmers 5300 21-19 5T (28633)

Chalmers 5300 21-19 6B (28634)

Chalmers 5300 21-19 7T2 (28635)

Chalmers 5300 21-19 8T (28636)

Chalmers 5300 21-19 9B (28648)

Chalmers 5300 21-19 10T (28637)

Chalmers 5300 21-19 11T (28649)

The NDIC field inspector, Rick Dunn (NDIC) was notified on 03/06/2015

The surface owners, Wesley and Barbara Lindvig, 14075 41st Street NW, Alexander, ND 58831, were contacted on 03/06/2015

Spread material out in pit, cut top edge of liner and fold over cuttings, cover entire pit with liner, back fill with clay
slope and contour well site to ensure proper drainage

Company Oasis Petroleum North America LLC	Telephone Number 281-404-9436	
Address 1001 Fannin, Suite 1500		
City Houston	State TX	Zip Code 77002
Signature 	Printed Name Jennifer Swenson	
Title Regulatory Specialist	Date June 4, 2015	
Email Address jswenson@oasispetroleum.com		

FOR STATE USE ONLY

<input checked="" type="checkbox"/> Received	<input type="checkbox"/> Approved
Date 9-23-15	
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)

Well File No. **28648**

PLEASE READ INSTRUCTIONS BEFORE FILLING OUT FORM.

PLEASE SUBMIT THE ORIGINAL AND ONE COPY.

Designate Type of Completion							
<input checked="" type="checkbox"/> Oil Well	<input type="checkbox"/> EOR Well	<input type="checkbox"/> Recompletion	<input type="checkbox"/> Deepened Well	<input type="checkbox"/> Adder Horizontal Leg	<input type="checkbox"/> Extended Horizontal Leg		
<input type="checkbox"/> Gas Well	<input type="checkbox"/> SWD Well	<input type="checkbox"/> Water Supply Well	<input type="checkbox"/> Other:				
Well Name and Number Chalmers 5300 21-19 9B				Spacing Unit Description Sec. 19/20 T153N R100W			
Operator Oasis Petroleum North America		Telephone Number (281) 404-9591		Field Baker			
Address 1001 Fannin, Suite 1500				Pool Bakken			
City Houston	State TX	Zip Code 77002	Permit Type				
<input type="checkbox"/> Wildcat					<input checked="" type="checkbox"/> Development	<input type="checkbox"/> Extension	

LOCATION OF WELL

At Surface		Qtr-Qtr	Section	Township	Range	County
2259 F N L	327 F WL	LOT2	19	153 N	100 W	McKenzie
Spud Date	Date TD Reached	Drilling Contractor and Rig Number	KB Elevation (Ft)		Graded Elevation (Ft)	
December 1, 2014	February 27, 2015	Nabors B22	2076		2051	

Type of Electric and Other Logs Run (See Instructions)

MWD/GR from KOP to TD; CBL from Int. TD to surface

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

PERFORATION & OPEN HOLE INTERVALS

PRODUCTION

Current Producing Open Hole or Perforated Interval(s), This Completion, Top and Bottom, (MD Ft) Lateral 1- 11080' to 20435'							Name of Zone (If Different from Pool Name)	
Date Well Completed (SEE INSTRUCTIONS) May 18, 2015			Producing Method Flowing		Pumping-Size & Type of Pump			Well Status (Producing or Shut-In) Producing
Date of Test 05/18/2015	Hours Tested 24	Choke Size 32 /64	Production for Test		Oil (Bbls) 1234	Gas (MCF) 1054	Water (Bbls) 1364	Oil Gravity-API (Corr.) °
Flowing Tubing Pressure (PSI)		Flowing Casing Pressure (PSI)		Calculated 24-Hour Rate	Oil (Bbls) 1234	Gas (MCF) 1054	Water (Bbls) 1364	Gas-Oil Ratio 854

GEOLOGICAL MARKERS

PLUG BACK INFORMATION

CORES CUT

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

Drill Stem Test

Well Specific Stimulation

Date Stimulated 04/27/2015	Stimulated Formation Bakken		Top (Ft) 11080	Bottom (Ft) 20435	Stimulation Stages 36	Volume 215116	Volume Units Barrels
Type Treatment Sand Frac	Acid %	Lbs Proppant 3817790	Maximum Treatment Pressure (PSI) 9426		Maximum Treatment Rate (BBLS/Min) 75.0		
Details 100 Mesh White: 286610 40/70 Ceramic: 1441370 30/50 Ceramic: 2089810							
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 jswenson@oasispetroleum.com	Date 06/23/2015
Signature 	Printed Name Jennifer Swenson	Title Regulatory Specialist

Industrial Commission of North Dakota
Oil and Gas Division

Well or Facility No

28648

Verbal Approval To Purchase and Transport Oil Tight Hole Yes

OPERATOR

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

Well Name CHALMERS 5300 21-19 9B	Inspector Richard Dunn
Well Location QQ Sec Twp Rng	County MCKENZIE
LOT2 19 153 N 100 W	Field BAKER
Footages 2259 Feet From the N Line	Pool BAKKEN
327 Feet From the W Line	
Date of First Production Through Permanent Wellhead	5/18/2015 This Is Not The First Sales

PURCHASER / TRANSPORTER

Purchaser OASIS PETROLEUM MARKETING LLC	Transporter POWER CRUDE TRANSPORT, INC.
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TANK BATTERY

Central Tank Battery Number : 228633-01

SALES INFORMATION This Is Not The First Sales

ESTIMATED BARRELS TO BE SOLD	ACTUAL BARRELS SOLD	DATE
15000	BBLS	236
	BBLS	BBLS

DETAILS

Must also forward Forms 6 & 8 to State prior to reaching 15000 Bbl estimate or no later than required time frame for submitting those forms.

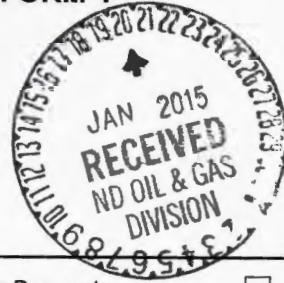
Start Date	5/18/2015
Date Approved	6/17/2015
Approved By	Richard Dunn



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600 EAST BOULEVARD DEPT 405
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SFN 5749 (09-2006)

Well File No.
28648



PLEASE READ INSTRUCTIONS BEFORE FILLING OUT FORM.

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Notice of Intent

Approximate Start Date

Report of Work Done

Date Work Completed
January 15, 2015

Notice of Intent to Begin a Workover Project that may Qualify
for a Tax Exemption Pursuant to NDCC Section 57-51.1-03.

Approximate Start Date

Drilling Prognosis

Spill Report

Redrilling or Repair

Shooting

Casing or Liner

Acidizing

Plug Well

Fracture Treatment

Supplemental History

Change Production Method

Temporarily Abandon

Reclamation

Other

Cement Report

Well Name and Number

Chalmers 5300 21-19 9B

Footages

2259 F N L

322

326 F W L

Qtr-Qtr

LOT2

Section

19

Township

153 N

Range

100 W

Field

Bakken

Pool

Bakken

County

McKenzie

24-HOUR PRODUCTION RATE

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

Name of Contractor(s)

Address

City

State

Zip Code

DETAILS OF WORK

Oasis Petroleum respectfully submits a report of work done on the above referenced well.

Attached is a step by step breakdown of work done.

* After review of the 3-26-2015 Ultrasonic log and the attached Information
Oasis is ok to proceed with the completion down 7" Casing Provided
Compliance with 43-02-03-27.1.

Company Oasis Petroleum North America LLC	Telephone Number 281-404-9436
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Address 1001 Fannin, Suite 1500

City Houston	State TX	Zip Code 77002
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Signature 	Printed Name Jennifer Swenson
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Title Regulatory Assistant	Date January 15, 2015
--------------------------------------	---------------------------------

Email Address jswenson@oasispetroleum.com

FOR STATE USE ONLY

<input checked="" type="checkbox"/> Received	<input type="checkbox"/> Approved
Date 4-1-2015	
By	
Title Geologist	
Richard A. Suggs	

7" Cement Job
Chalmers 5300 21-19 9B

Single Bakken well on a 1280 Drilling Unit

AFE: AFE1948

McKenzie County, ND
September, 2014

North Dakota Permit Number: 28648

API Number: 33-053-06023

Commission Order #: 23752

Field: Baker

Pool: Bakken

- 7" Shoe @ 11,080' MD / 10,756' TVD.
- DV tool @ 10,343' MD / 10,350' TVD.
- 9-5/8" casing ran and cemented across the Dakota to 6060' MD/TVD, USIT shows TOC on 9-5/8" @ 2140' TVD.
- First Stage pumped 38.4 bbls of 15.8 ppg tail slurry and opened up DV tool and circulated 14 bbls of cement to surface.
 - 7" shoe to DV tool is isolated with 15.8 tail cement.
- Second Stage pumped 40 bbls spacer, 42 bbls scavenger cement, 69 bbls 12.1 ppg lead, and 70 bbls 15.8 ppg tail (planned for 140 bbls).
- While pumping Second Stage, operator notices saltwater valve was leaking into tail slurry and soon after cement truck packed off.
- Attempted to circulate out cement with rig pumps, pumping 30 bbl fresh water followed by 368 bbls invert.
- Pumps pressured up while circulating after getting 5 bbls of spacer to surface.
- Calculated top of 2nd Stage Lead = 2,591'.
- Calculated bottom of 2nd Stage Tail = 7,404'.
- We will close DV tool and DV tool will be below liner hanger.
- No changes to completion strategy is anticipated.

Suggs, Richard A.

From: Mike Brown <mbrown@oasispetroleum.com>
Sent: Wednesday, April 01, 2015 3:15 PM
To: Suggs, Richard A.
Subject: Chalmers 5300 21-19 9B cement

Richard,

Here are some notes of the operations on the Chalmers 5300 21-19 9B:

- After landing the bomb on the DV tool, we circulated out 14bbls of cement to surface from the first stage (7" shoe to DV tool)
- When drilling out of the shoe, there was cement in the curve that needed to be milled up. Good cement at the shoe
- After being notified of need to test DV tool after drilling through it, we ran bridge plug below the DV and tested to 1515psi for 30min – good test
- We cemented the liner. Bumped plug, floats held. 10bbls of cement circulated to surface after stinging out of liner top.

We are proposing to frac down the 7" casing as originally planned. Please inform Oasis of any need to frac down a tieback string or perform any sort of remediation prior to commencing frac operations.

Thanks,

Mike Brown
Completions Engineer
Office: 281-404-9634
Cell: 281-732-7482
1001 Fannin, Suite 1500
Houston, Texas 77002
mbrown@oasispetroleum.com

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						CHALMERS 5300 21-19 9B						AFE1948			
						Lat: 48° 3' 40.970 N Long: 103° 36' 10.110 W						Well ID: 16342			
Report Date: 01/13/2015						Daily Drilling Report						DFS: 12 EST DAYS: 23			
RPT NO.	OPERATOR	FIELD NAME		RIG NAME/NO			TMD	TVB	FOOTAGE	ROP(Last)	Avg ROP				
14	OASIS PETROLEUM NORTH AMERICA LL	INDIAN HILL		NABORS B22			11,128.0 usft	10,758.0 usft	-	-	0.0 ft/hr				
API	STATE	COUNTY		LOCATION			SIDETRACK NO								
33053060230000	NORTH DAKOTA	MCKENZIE		T153N R100W SECTION 19 OH											
PREVIOUS WELL RIG RELEASE	SPUD DATE	DATE TD REACHED		RIG RELEASE		REPORT DESCRIPTION									
12/30/2014 18:00	01/01/2015 23:00	02/26/2015 00:00		2/26/2015 10:00:00PM		INTER CSG/CMT									
CURRENT STATUS	TARGET FORMATION					KB ELEV	MUD COST(DAY/CUM)								
HOLD BACK PRESSURE ON CEMENT HEAD	THREE FORKS					2,076.0 usft	\$0.00 / \$55,988.89								
24 HR FORECAST	SAFETY MEETING TOPIC					ACC LST 24 HRS?	DAY / PHASE / CUM COST								
HOLD PRESSURE, PICK STACK, SET SLIPS, CUT CASING, NIPPLE DOWN, SKID, NIPP CEMENTING	CEMENTING					No	\$80,235.00 / \$160,470.00 / \$2,257,670.28								
24 HR OPERATIONS SUMMARY															
CIRC & WORK CASING, RIG UP CEMENTERS & SAFETY MTG, CEMENT 7" CASING, CIRC, HOLD BACK PRESSURE															
RIG DIRECTIONS															
Travel South Of Williston To County Rd 29 Travel East For 2 Miles Turn North & Travel 4.8 Miles To Rig.															
LAST CASING		NEXT CASING			LAST BOP TEST		AUTH TMD/AUTH COST		SUPERVISOR / ENGINEER						
7,000 in @ 11,080.0 usft		4,500 in @ 20,476.0 usft			1/2/2014		1,005.0 usft / \$7,797,030		Doug Rakstad / TY TSCHACHER						
BITS/BIT OPERATIONS															
BIT NO	SIZE (in)	MANUF	MODEL	SERIAL #	JETS / TFA (32nd")	WOB (Min/Max) (kip)	RPM (Min/Max) (rpm)	DEPTH IN/OUT (usft)	FTG (Last/Cum) (usft)	HRS (Last/Cum) (hr)	ROP (Last/Cum) (ft/hr)	I-O-B-G-R			
6	6.000	B HUGHES	T-406	7149149	6 / 18 / 1.491	—/—	—/—	11,128.0 14,878.0	— —	— —	— —	1-1-X- I-DTF			
OPERATION DETAILS															
Total Hours 24.00															
HOURS	DURATION (hr)	PHASE	CODE	SUBCODE	DESCRIPTION										
06:00 - 16:00	10.00	INTCSG	12	RUN CASING	CIRC & WORK CASING 4 BTMS UP, STAGE UP PUMP TO ESTABLISH 6 BPM										
16:00 - 16:30	0.50	INTCSG	12	RIG UP / RIG DOWN	RIG UP CEMENTERS & SAFETY MTG										
16:30 - 03:00	10.50	INTCSG	12	CEMENTING	CEMENT 7" CASING, 1ST STAGE, PRESSURE TEST LINES, 40 BBL OTF SPACER @ 11#, 38.4 BBL TAIL SLURRY @ 15.8#, SHUT DOWN DROP DART, 30 BBL H2O, 367 BBL OF INVERT, DART DIDNT BUMP, DISPLACED 1.5 BBL OVER, FLOATS HELD, DROP OPENING CONE, WAIT 55 MIN TO DROP, PRESSURE UP & OPEN DV TOOL @ PSI, CIRC 1.5 BTMS UP, 40 BBL OTF SPACER & 14 BBL CEMENT TO SURFACE, 2ND STAGE, 40 BBL OTF SPACER, 42 BBL SCAVENGER @ 11#, 69 BBL LEAD @ 12.1#, @ 70 BBL TAIL AWAY @ 15.8#, OPERATOR NOTICED SALTWATER VALVE WAS LEAKING BY INTO TAIL SLURRY, SOON AFTER CEMENT TRUCK PACKED OFF DUE TO THIS, CEMENT TRUCK THEN PUMPED 40 BBL H2O TO CLEAR LINES, DECISION MADE TO ROLL CEMENT OUT OF HOLE, SWITCHED TO RIG PUMPS THEN PUMPED 30 BBL FRESHWATER, FOLLOWED BY 368 BBL INVERT, PRESSURE BEGAN TO CLIMB, 5 BBL OTF SPACER TO SURFACE, LOST RETURNS, PUMPED 40 BBL INVERT AWAY, SHUT DOWN, BLED OFF PRESSURE, NOT FLOWING BACK, PUMPED 1000 PSI, SHUT IN CEMENT HEAD, HOLD FOR 2 HRS, CALCULATED BTM OF CEMENT @ 7900', 2400' ABOVE DV TOOL HAS NO CEMENT, TOP OF LEAD @ 2745', TOP OF SCAVENGER 1178',										
03:00 - 06:00	3.00	INTCSG	12	WAIT ON CEMENT	SHUT CEMENT HEAD IN WITH 1000 PSI, OPEN UP AFTER 2 HRS, FLOWING BACK, SHUT BACK IN										
COMMENT:															
SURVEY DATA															
MD (usft)	INCL (°)	AZI (°)	TVB	VS (usft)	DLS ('/100ft)	N/S	E/W	MD (usft)	INCL (°)	AZI (°)	TVB	VS (usft)	DLS ('/100ft)	N/S	E/W
0.0	0.00	0.00	0.0	0.0	0.00	0.0	0.0								
BHA NO.	6	BHA						MUD ADDITIVES						TOTAL COST	
ITEM		ITEM DESCRIPTION			JTS	OD (in)	ID (in)	LENGTH (ft)	ITEM	USED	COST	INVENTORY			
Cross Over		XT-39PIN X VX-39 BOX				4.500	3.000	2.36	FLYASH		\$0.00	09			
Underreamer		GHOST REAMER XT-39				4.500	3.000	7.40	NOV-DETERGENT		\$0.00	05 GAL PAIL			
Cross Over		VX-39 PIN X XT-39 BOX				4.500	3.000	2.10	SOAP STICKS		\$0.00	0 SKS			
Drill Pipe		OASIS 4" PIPE			3	4.000	3.000	94.22	MICA		\$0.00	0 SKS			
Cross Over		3 1/2 IF PIN X VX-39 BOX				4.500	2.750	1.73	NOV CC BLEND		\$0.00	-30 SKS			
Non-Mag Drill Collar		NON-MAG SLICK			3	4.750	2.750	92.42	NOV FIBER		\$0.00	0 SKS			
Pulser Sub		ORIENTING SUB				4.750		3.83	NOV PLEX		\$0.00	0 SKS			
Non-Mag Pony Collar		NON-MAG PONY			3	4.750	2.750	9.65	NOV WATE		\$0.00	-418 SKS			
Bent Housing		BAKER, 1.5 FBH, 1.03 RPG, 5/6 LOBE,			1	4.750		32.79	OBM, WA		\$0.00	-3 DRUM			
Polycrystalline Diamond Bit		6 BLADE BAKER				6.000		1.00	SAW DUST		\$0.00	0 SKS			
												PALLETS		\$0.00	-20 EACH
												SHRINK WRAP		\$0.00	-18 EACH
												GILSONITE		\$0.00	0 SKS
												LIME		\$0.00	-113 SKS
												OBM MUL I		\$0.00	-5 DRUM
												OBM MUL II		\$0.00	-6 DRUM
												PREMAVIS PLUS		\$0.00	-42 SKS
												DRUM DISPOSAL		\$0.00	0 EACH

CHALMERS 5300 21-19 9B
Lat: 48° 3' 40.970 N Long: 103° 36' 10.110 W

AFE1948

Well ID: 16342

Report Date: 01/13/2015

Daily Drilling Report

DFS: 12 EST DAYS: 23

BHA NO.	6	BHA				MUD ADDITIVES			TOTAL COST		\$0.00
ITEM	ITEM DESCRIPTION	JTS	OD (in)	ID (in)	LENGTH (ft)	ITEM	USED	COST	INVENTORY		
ENGINEERING						\$0.00	-8 EACH				
MUD LAB RENTAL						\$0.00	-4 EACH				
SALES TAX						\$0.00	-1,756 EACH				
TRUCKING						\$0.00	-4,000 EACH				
NOV Xan-L						\$0.00	0 5 GAL PAIL				
JET TROL PLUS						\$0.00	0 SXS				
Salt Gel						\$0.00	0 sks				
GYPSUM						\$0.00	0 SKS				
HDL PLUS						\$0.00	0 DRUM				
NOVA XAN-L						\$0.00	0 5 GAL PAIL				
NOVA EXP						\$0.00	0 DRUM				
LATERAL LUBE III						\$0.00	0 DRUM				
MF-55						\$0.00	0 5 GAL PAIL				
NOV ROP						\$0.00	0 5 GAL PAIL				
WT 904A						\$0.00	0 5 GAL PAIL				
MISSING COST						\$0.00	CORRECTION				
NOV RA FS						\$0.00	0 5 GAL PAIL				
NOV RA FS						\$0.00	0 DRUM				
SAPP						\$0.00	0 SKS				
SODA ASH						\$0.00	0 SKS				
BULK BARITE						\$0.00	-41 TONS				
NOV CARB						\$0.00	0 SKS				
SAPP STICKS						\$0.00	0 STICKS				
NOV HIGH YEILD GEL						\$0.00					
FIBER PLUG						\$0.00					
GILSOCOL						\$0.00	-25 SKS				
TORQUE ON BTM (ft-lbf)	TORQUE OFF BTM (ft-lbf)				TOTAL LENGTH (ft)	247.50					
STRING WEIGHT (kip)	STRING WEIGHT UP (kip)	STRING WEIGHT DWN (kip)									
Density (ppg)	10.35	Bgas (gas u)	TGas (gas u)	/	MUD CHECK		MUD LOST (bbi)				
FV (s/qt)	WL HTHP (cc/30min)	PV/YP (cp)(lbf/100ft ⁴)	GELS (lbf/100ft ⁴)	ES	FC(32nd") /Cl(ppm)	Salt(%)	CORR(%)	CA(ppm)	OIL/WAT	ECD(ppg)	LGS/HGS (%)
48.00	6.8	13.00/10.000	8.000/11.000	537.0	2.0/-	-	-	-	80.00/20.00	10.69	4.10/8.80
LAST CEMENT JOB											
Finished cementing the Chalmers 21-19 9T2 from 5.0' to 2,190.0' on 12/09/2014 02:59											
FLUID NAME	DESCRIPTION	DENSITY(ppg)	VOLUME(bb)	SACKS USED	FLUID NAME	DESCRIPTION	DENSITY(ppg)	VOLUME(bb)	SACKS USED		
PROFLUSH	Gel Water	8.60	20.00		LEAD SLURRY	Cement	12.20	310.91	769		
TAIL SLURRY	Cement	14.20	99.20	395	SPACER	FW Spacer	8.33	20.00			
DISPLACEMENT	Invert	10.00	290.00		DISPLACEMENT	SW	10.00	21.00			
NOTES:											



Cement Job Log

Stage 1

Customer: Oasis Petroleum			Date: 1/11/2015	Invoice #:	Serv. Supervisor: Gabe Boe						
Lease: Chalmers 5300 21-19 9B			Coordinator: Kevin Moore		County and State: Williams ND						
Contact: Doug	Rig: Nabors B22		Type of Job:	7" intermediate 2 stage							
Employees & Units on Job Site:	Gabe Boe	912064	Jason Mingus	933153	Justin Duval	931698					
George Martin	931694	Robert Pickering	931705	Daniel Belsher	932799	John Kneriem p/u					
Plugs	Casing Hardware			Physical Slurry Properties							
			Sacks of Cement	Slurry Wt PPG	Slurry Yld CuFt/SK	H2O Gal/sk BBLs BBLS of Mix Water					
Materials Furnished by NCPS											
Spacer:	OTF-1 spacer with 40 gallon surper surf					80					
Lead:	65:35HighEarly+Flyash+1.3%BWVOCAirout+10%Bent+1%Sup			73	11	3.23					
Sil+.8%SupCr-2+.35AG350+.75CemStab-1+.25ppsSuperFlake				171	12.1	2.29					
Tail:	PremClassG+.5%Airout+.55%SupFL-350+.25%AG350+.4%			651	15.8	1.54					
SupCR3+.1%CemStab-1+35%SuperSF+.25SupFlake+3%KCL					6.16	178.55					
Acid:						96.1					
Displacement Chemicals:											
HOLE		TUBING - CASING - DRILL PIPE					COLLAR DEPTHS				
SIZE	% EXCESS	DEPTH	SIZE	WGT	TYPE	DEPTH	GRADE	ID	SHOE	FLOAT	
8 3/4		111301	7	32		11080				10997.45	
LAST CASING			PKR / CMT RET / LINER PKR			PERF DEPTH		TOP CONN		WELL FLUID	
SIZE	ID	DEPTH	BRAND / TYPE	DEPTH	TOP	BTM	SIZE	THREAD	TYPE	WGT	
						10839					
DISPL VOLUME		DISPL FLUID		CAL PSI		WATER	CEMENT TEMP		MAX PRESSURE		Bbls H2O on Loc.
VOLUME	UOM	TYPE	WGT	BMP PLUG	PH	TEMP	GOING DOWN HOLE	RATED	WORKING		
397.0	BBL	SALT H2O	9.8	1980	6.9	57		5,000	5,000	500	
Time Hrs	Rate	Pressure	BBLS Stage	BBLS Job	Fluid Type	Time Left Yard	3:30 PM	Time Left Loc			
						Time Arrived on Loc	5:10 PM	Time Arrived Yard			
2:00 PM				0		convoy meeting/leave yard					
5:10 PM				0		arrive location					
5:15 PM				0		hazzard survey					
5:20 PM				0		speak to company hand					
5:25 PM				0		rig running casing					
5:40 AM				0		rig done casing / moving casing equipment / start rig in					
5:45 AM				0		rig pumping to get better circulation rate and psi					
4:00 PM				0		safety meeting					
4:40 PM	2	20	3	3	H2O	fill lines					
4:41 PM		6400		3	H2O	psi test					
4:52 PM	3.5	220	40	43	OTF Spacer	OTF spacer					
5:01 PM	3.5	230	38.4	81.4	Tall Cmt	Start Cement @ 15.8 ppg					
5:05 PM				81.4		Scaled cement @ 15.7 truck @ 15.9					
5:18 PM		0		81.4		end cement					
5:19 PM				81.4		drop dart					
5:24 PM	5	100	30	111.4	H2O	Start displacement with 30 bbls fresh H2O					
5:34 PM	5	400	367	478.4	Invert	Start invert displacement					
6:47 PM	2	300		478.4		slow rate through tool					
7:07 PM		0		478.4		finish displacement 1.5 bbl over / did not bump					
7:20 PM				478.4		drop opening cone and let fall for 55 min					
8:20 PM	3	900	5	483.4	Invert	open tool / 800 psi up to 900 psi					
8:22 PM	5.5	1000	437	920.4	Invert	1.5 X bottoms up with invert					
9:10 PM				920.4		OTF to surface @ 240 away					
10:04 PM				920.4		end 1.5 X bottoms up					
				920.4							
					44	BBLS OTF Spacer					
Bumped Plug	Final Lift Pressure	Floats Held	PSI Left on Casing		NA	BBLS Salt Water to Surface				Gabe Boe	
NO	700	YES	1000		0	BBLS Fresh Water to Surface				Service Supervisor	
					14	BBLS Cement to Surface					



**NABORS COMPLETION &
PRODUCTION SERVICES CO.**

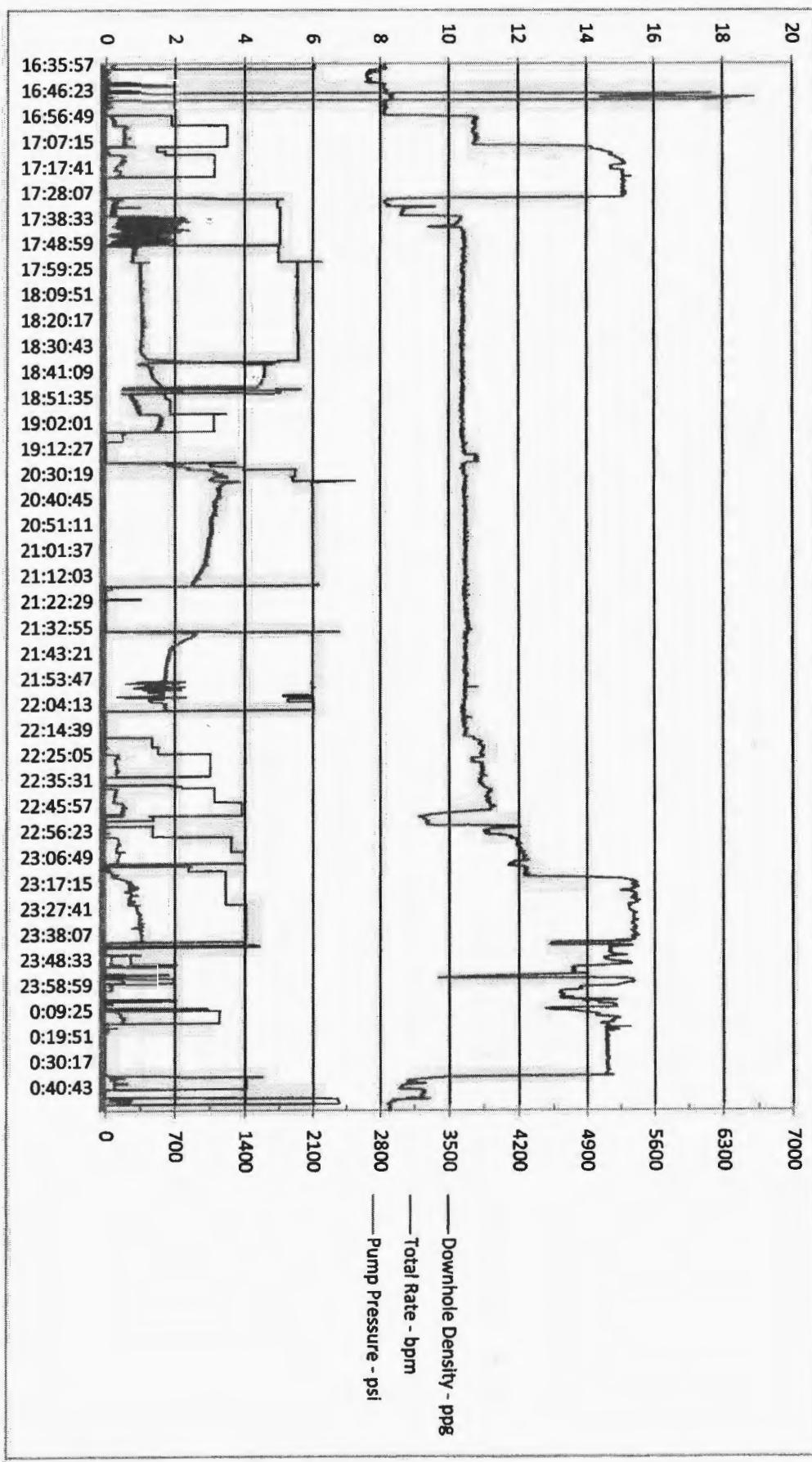
Cement Job Log

Stage 2

Specific job request from customer:

**Customer
Signature**

Oasis Chalmers 5300 21-19 9B 2 Stage Intermediate





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)

APR 2015
RECEIVED
ND OIL & GAS
DIVISION

Well File No.
28648

PLEASE READ INSTRUCTIONS BEFORE FILLING OUT FORM.

PLEASE SUBMIT THE ORIGINAL AND ONE COPY.

Notice of Intent

Approximate Start Date
March 31, 2015

Report of Work Done

Date Work Completed

Notice of Intent to Begin a Workover Project that may Qualify
for a Tax Exemption Pursuant to NDCC Section 57-51.1-03.

Approximate Start Date

Drilling Prognosis

Spill Report

Redrilling or Repair

Shooting

Casing or Liner

Acidizing

Plug Well

Fracture Treatment

Supplemental History

Change Production Method

Temporarily Abandon

Reclamation

Other Change well status to CONFIDENTIAL

Well Name and Number

Chalmers 5300 21-19 9B

Footages 2259 F N L	327	Qtr-Qtr 326 F W L	LOT2	Section 19	Township 153 N	Range 100 W
Field Baker	Pool BAKKEN			County McKenzie		

24-HOUR PRODUCTION RATE

	Before	After
Oil	Bbls	Oil
Water	Bbls	Water
Gas	MCF	Gas

Name of Contractor(s)

Address	City	State	Zip Code
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DETAILS OF WORK

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

This well has not been completed.

OFF CONFIDENTIAL 10/01/15.

Company Oasis Petroleum North America LLC	Telephone Number 281-404-9436	
Address 1001 Fannin, Suite 1500		
City Houston	State TX	Zip Code 77002
Signature 	Printed Name Jennifer Swenson	
Title Regulatory Specialist	Date March 31, 2015	
Email Address jswenson@oasispetroleum.com		

FOR STATE USE ONLY

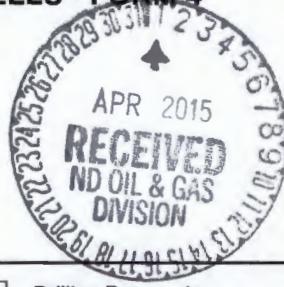
<input type="checkbox"/> Received	<input checked="" type="checkbox"/> Approved
Date 4/08/15	
By 	
Title Engineering Technician	



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)

Well File No.
28648



PLEASE READ INSTRUCTIONS BEFORE FILLING OUT FORM.

PLEASE SUBMIT THE ORIGINAL AND ONE COPY.

<input checked="" type="checkbox"/> Notice of Intent	Approximate Start Date March 31, 2015	<input type="checkbox"/> Drilling Prognosis	<input type="checkbox"/> Spill Report
<input type="checkbox"/> Report of Work Done	Date Work Completed	<input type="checkbox"/> Redrilling or Repair	<input type="checkbox"/> Shooting
<input type="checkbox"/> 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	<input type="checkbox"/> Casing or Liner	<input type="checkbox"/> Acidizing
		<input type="checkbox"/> Plug Well	<input type="checkbox"/> Fracture Treatment
		<input type="checkbox"/> Supplemental History	<input type="checkbox"/> Change Production Method
		<input type="checkbox"/> Temporarily Abandon	<input type="checkbox"/> Reclamation
		<input type="checkbox"/> Other	Waiver from tubing/packer requirement

Well Name and Number

Chalmers 5300 21-19 9B

Footages	327	Qtr-Qtr	Section	Township	Range
2259 F N L	326 F W L	LOT2	19	153 N	100 W
Field Baker	Pool Bakken		County	McKenzie	

24-HOUR PRODUCTION RATE

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

Name of Contractor(s)

Address	City	State	Zip Code
---------	------	-------	----------

DETAILS OF WORK

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

The following assurances apply:

1. the well is equipped with new 29# and 32# casing at surface with an API burst rating of 11,220 psi;
2. The Frac design will 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 flowback than during the frac job;
5. The frac fluid and formation fluids have very low corrosion and erosion rates;
6. Production equipment will be installed as soon as possible after the well ceases flowing;
7. A 300# gauge will be installed on the surface casing during the flowback period

Company Oasis Petroleum North America LLC	Telephone Number 281-404-9436	
Address 1001 Fannin, Suite 1500		
City Houston	State TX	Zip Code 77002
Signature 	Printed Name Jennifer Swenson	
Title Regulatory Specialist	Date March 31, 2015	
Email Address jswenson@oasispetroleum.com		

FOR STATE USE ONLY

<input type="checkbox"/> Received	<input checked="" type="checkbox"/> Approved
Date <i>April 1, 2015</i>	
By 	
Title PETROLEUM ENGINEER	



SUNDRY NOTICES AND REPORTS ON WELLS - FORM 4

INDUSTRIAL COMMISSION OF NORTH DAKOTA
OIL AND GAS DIVISION
600 EAST BOULEVARD DEPT 405
BISMARCK, ND 58505-0840
SFN 5749 (09-2008)

Well File No.

28648



PLEASE READ INSTRUCTIONS BEFORE FILLING OUT FORM.

PLEASE SUBMIT THE ORIGINAL AND ONE COPY.

<input checked="" type="checkbox"/> Notice of Intent	Approximate Start Date September 2, 2014	<input type="checkbox"/> Drilling Prognosis	<input type="checkbox"/> Spill Report
<input type="checkbox"/> Report of Work Done	Date Work Completed	<input type="checkbox"/> Redrilling or Repair	<input type="checkbox"/> Shooting
<input type="checkbox"/> 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		<input type="checkbox"/> Casing or Liner	<input type="checkbox"/> Acidizing
		<input type="checkbox"/> Plug Well	<input type="checkbox"/> Fracture Treatment
		<input type="checkbox"/> Supplemental History	<input type="checkbox"/> Change Production Method
		<input type="checkbox"/> Temporarily Abandon	<input type="checkbox"/> Reclamation
		<input checked="" type="checkbox"/> Other	Physical Address

Well Name and Number

Chalmers 5300 21-19 9B

Footages	Qtr-Qtr	Section	Township	Range
2259 F N L 327 F W L	LOT2	19	153 N	100 W
Field BAKER	Pool Bakken		County McKenzie	

24-HOUR PRODUCTION RATE

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

Name of Contractor(s)

Address	City	State	Zip Code

DETAILS OF WORK

Oasis Petroleum respectfully submits the physical address for the above referenced well:

**13762 45th Street NW
Alexander, ND 58831**

Company Oasis Petroleum North America LLC	Telephone Number 281-404-9563	
Address 1001 Fannin, Suite 1500		
City Houston	State TX	Zip Code 77002
Signature 	Printed Name Heather McCowan	
Title Regulatory Assistant	Date September 2, 2014	
Email Address hmccowan@oasispetroleum.com		

FOR STATE USE ONLY

<input checked="" type="checkbox"/> Received	<input type="checkbox"/> Approved
Date 3/12/2015	
By 	
Title ENGINEERING TECHNICIAN	



Oasis Petroleum North America, LLC
Chalmers 5300 21-19 9B
2,259' FNL & 327' FWL
Lot 2 Sec. 19, 153N, 100W
Baker / Middle Bakken Member
McKenzie County, North Dakota

BOTTOM HOLE LOCATION:
155.94' S & 9,885.75' E of surface location or approx.
2,414.94' FNL & 276.40' FEL, SE NE Sec. 20, T153N, R100W

Prepared for:

Nathan Gabelman
Oasis Petroleum North America, LLC
1001 Fannin Suite 1500
Houston, TX 77002

Prepared by:

Michelle Baker, G. Wayne Peterson,
Zachary Moses, Molly Hagstrom
PO Box 80507; Billings, MT 59108
(406) 259-4124
geology@sunburstconsulting.com
www.sunburstconsulting.com

WELL EVALUATION



Figure 1. Nabors B22 drilling the Oasis Petroleum North America, LLC - Chalmers 5300 21-19 9B, February, 2015 in Baker Field, McKenzie County, North Dakota.

INTRODUCTION

The **Oasis Petroleum North America, LLC Chalmers 5300 21-19 9B** [Lot 2 Section 19, T153N, R100W] is located approximately 7 miles south of the town of Williston in McKenzie County, North Dakota. The Chalmers 5300 21-19 9B is a horizontal Middle Bakken well within the Williston Basin consisting of one 9,369' (uncased) lateral drilled toward the east. The vertical hole was planned to be drilled to approximately 10,230'. The curve would be built at 12 degrees per 100' to land within the Middle Bakken. This well is a two section lateral which originates in the northwest quarter of section 19, then drilled east to the northeast quarter of section 20. Directional drilling technologies and geosteering techniques were used to land in the Middle Bakken reservoir and maintain exposure to the ideal target rock.

OFFSET WELLS

Offset well data used for depth correlation during curve operations are found in the ‘Control Data’ section appended to this report. Offset well control was essential in curve operations, to successfully land within the Middle Bakken. Formation thicknesses expressed by gamma ray signatures in these wells were compared to gamma data collected during drilling operations in order to successfully land the curve. The target landing true vertical depth (TVD) was periodically updated during drilling to ensure accurate landing of the curve.

GEOLOGY

The Charles Formation [Mississippian Madison Group] was logged 8,535' MD 8,535' TVD (-6,459' SS). Samples in the lower portion of the Charles Formation consisted of a limestone mudstone, which was light brown, light gray brown, light gray brown, off white in color. It was microcrystalline, friable, laminated, with an earthy texture. A trace of intercrystalline porosity was observed as was *occasional to rare spotty light brown oil stain*. Occasionally noted was a dolomite mudstone, which was light brown, light gray, light gray brown in color. It was microcrystalline, friable-firm, laminated, with an earthy texture. Also noted was a trace of intercrystalline porosity, and *occasional spotty light brown oil stain*. Rarely noted was anhydrite, which was off white, cream in color. It was soft, microcrystalline, and massive with an earthy to amorphous texture. Following connections or periods of non-circulation, gas peaks of 40 to 42 units were noted, as were drilling gas shows of 31 to 40 units.

The Mission Canyon Formation [Mississippian Madison Group] was logged 9,435' MD 9,435' TVD (-7,359' SS). The Mission Canyon Formation consisted of a lime mudstone that was described as light gray, light brown to brown, gray brown, trace dark gray in color. The lime mudstone was predominately friable to firm, with an earthy to rarely crystalline in texture. Some intervals contained a trace of black-brown algal material, a trace of fossil fragments, and traces of disseminated pyrite. Also present was an argillaceous lime mudstone that was described as light gray, occasional medium gray, rare gray tan, rare off white, trace dark gray in color. The argillaceous lime mudstone was predominately firm to friable, crystalline to chalky texture. Some intervals contained a trace of disseminated pyrite. Gas shows of 33 to 64 units were present. Rare intercrystalline porosity was noted as well as traces to occasional *spotty light brown oil stain* was occasionally observed while logging the Mission Canyon Formation.

The Upper Bakken Shale [Mississippian-Bakken Formation] was drilled at 10,888' MD 10,727' TVD (-8,651' SS). Entry into this member was characterized by high gamma, elevated background gas and increased rates of penetration. The black to black gray carbonaceous and *petroliferous* shale was hard with a sub blocky to sub platy texture. Fracture porosity was noted, and trace minerals were observed to include disseminated pyrite and calcite fracture fill. Hydrocarbons evaluated in this interval reached a maximum of 2,365 units drilling gas, with a connection gas of 2,803 units.



Figure 2. Black carbonaceous and petroliferous shale from the Upper Bakken Shale.

The Middle Bakken [Mississippian-Devonian Bakken Formation] was reached at 10,958' MD 10,743' TVD (-8,667' SS) which was 4' low to the Oasis Petroleum NA LLC Chalmers 5300 21-19 8T. The target zone of the Middle Bakken was to be drilled in a predominately ten foot zone beginning ten feet below the Upper Bakken Shale.

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

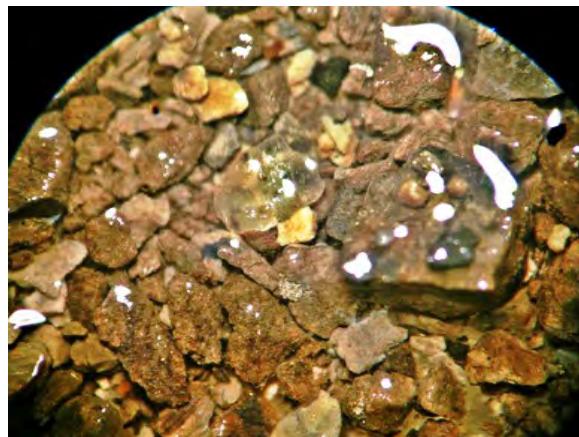


Figure 3. Predominately silty sandstone sample from the Middle Bakken target zone.

Hydrocarbon Shows

Gas monitoring and fluid gains provided evidence of a hydrocarbon saturated reservoir during the drilling of the Chalmers 5300 21-19 9B. Oil and gas shows at the shakers and in samples were continuously monitored. In the closed mud system, hydrostatic conditions were maintained near balance, this allowed for gas and fluid gains from the well to be evaluated. Gas on the Chalmers 5300 21-19 9B varied according to stratigraphic position and penetration rates which may have reflected increased porosity. During the vertical, gas peaks of 35 to 64 units were

noted, against a 10.1-11.4 lb/gal diesel-invert mud weight. Background concentrations in the lateral ranged from 1,000 to 5,100 units, against a 9.65-10.2 lb/gal saltwater gel drilling fluid. Connection peaks of 2,000 to 4,500 units were observed, as were drilling gas shows of 2,500 units to 5,736 units coinciding with the best shows. Drilling out of casing at 11,127' MD yielded a trip gas of 4,875 units. At 12,600' the gas buster was turned on, resulting in 5'-10' intermittent flare and a 20'-25' large bright orange trip flair at 14,878'. Chromatography of gas revealed typical concentrations of methane, characteristic of Middle Bakken Member gas.



Figure 4. Trip flare corresponding to 5,500 units TG in the lateral at 14,878' MD on the Chalmers 9B.

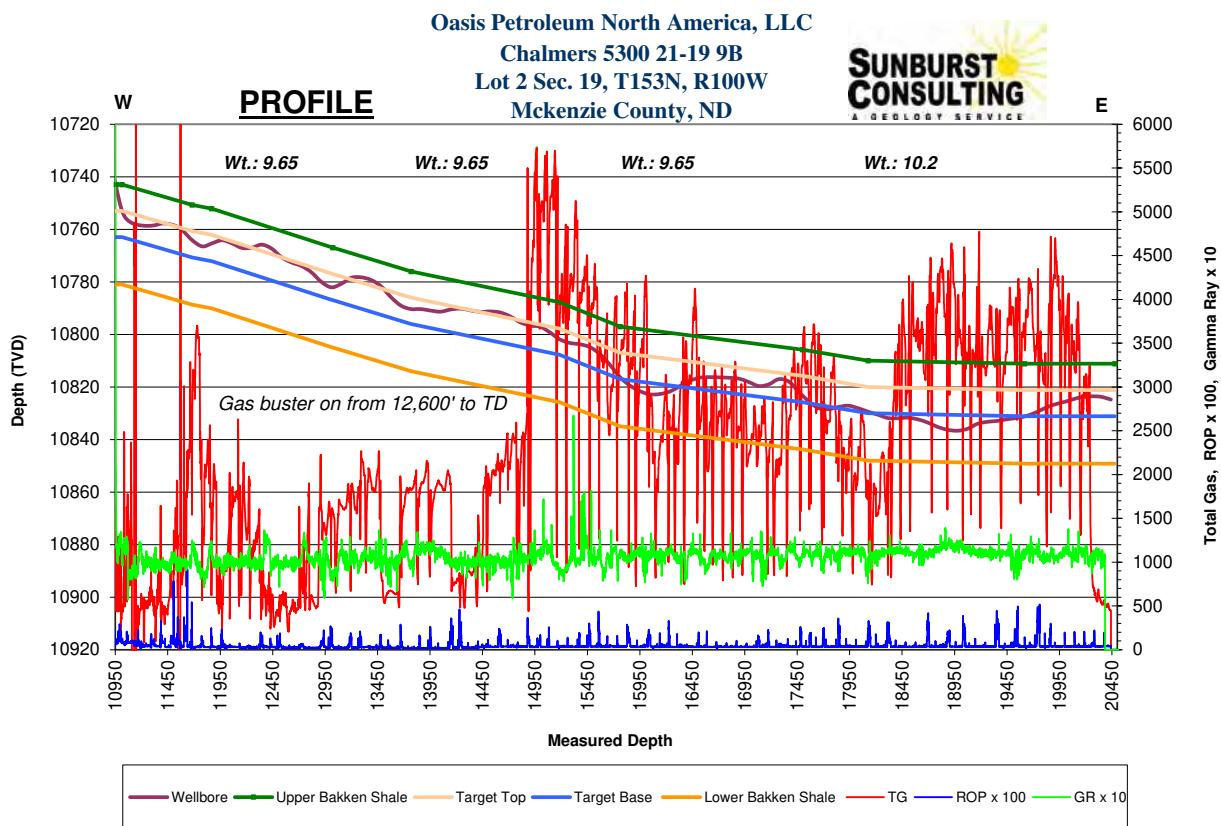


Figure 5. Profile displaying total gas, gamma ray and rate of penetration.

Geosteering

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

The 904' curve was drilled in 24 hours. It was drilled with a bottom hole assembly (BHA) consisting of bit #3, a Security MMD55M PDC bit, attached to a 2.38 degree fixed NOV stage 7/8 5.0 motor and MWD tools. The curve was successfully landed at 11,127' MD and 10,758' TVD, approximately 15' into the Middle Bakken. Seven inch diameter 32# HCP-110 casing was set to 11,071' MD.

Geologic structure maps of the Chalmers 5300 21-19 9B and surrounding control wells had estimated formation dip to be a down dip at approximately 0.5° down to the TD of the lateral. The preferred drilling interval of the Chalmers 5300 21-19 9B consisted of a ten foot zone located approximately ten feet into the Middle Bakken. Penetration rates, gas shows, gamma ray data, and sample observations were utilized to keep the wellbore in the preferred stratigraphic position in the target zone. Using offset well data provided by Oasis representatives, projected porosity zones were identified in the preferred drilling areas.

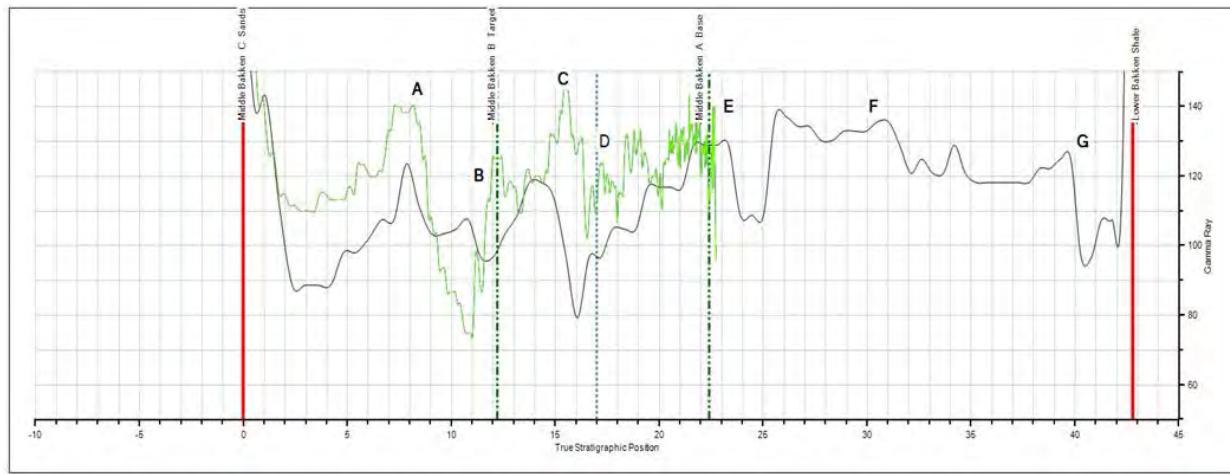


Figure 6. Offset well target definition, Indian Hills Prospect (Oasis).

Steering decisions were made by using gamma markers identified by Oasis representatives. The high gamma (C) in the upper portion of the drilling zone was useful in identifying the well bore placement in formation. The slightly lower gamma (B) was observed as the well bore moved to the top of the target zone, followed by lower gamma as the well bore moved higher, out of the target zone. Low gamma in the middle of the target zone (D) was noted as the well bore moved to the middle of the target zone. As the well bore moved lower in formation, the higher gamma (E) was noted as was lower gamma as the well bore moved lower in formation, exiting the target zone. Samples collected when drilling below the target zone tended to have a greater concentration of the light gray to gray silty sandstone than did the samples collected when the well bore was higher in the target zone. The TD of 20,440' MD was achieved at 16:40 hours

CST February 26, 2015. The well site team worked together to maintain the well bore in the desired target interval for 77% of the lateral, opening 9,369' of potentially productive reservoir rock. The hole was then circulated and reamed for completion.

SUMMARY

The Chalmers 5300 21-19 9B is a successful well in Oasis Petroleum's horizontal Middle Bakken development program in Baker Field. The project was drilled from surface casing to TD in 20 days. The TD of 20,440' MD was achieved at 16:40 hours CST February 26, 2015. The well site team worked together to maintain the well bore in the desired target interval for 77% of the lateral, opening 9,369' of potentially productive reservoir rock.

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

Gas on the Chalmers 5300 21-19 9B varied according to stratigraphic position and penetration rates which may have reflected increased porosity. The overall gas and hydrocarbon shows were encouraging and indicate a hydrocarbon rich system in the Middle Bakken.

The Oasis Petroleum North America, LLC. Chalmers 5300 21-19 9B awaits completion operations to determine its ultimate production potential.

Respectfully submitted,

*G. Wayne Peterson
Michelle R. Baker*
Sunburst Consulting, Inc.
27 February, 2015

WELL DATA SUMMARY

OPERATOR: Oasis Petroleum North America, LLC

ADDRESS: 1001 Fannin Suite 1500
Houston, TX 77002

WELL NAME: Chalmers 5300 21-19 9B

API #: 33-053-06023

WELL FILE #: 28648

SURFACE LOCATION: 2,259' FNL & 327' FWL
Lot 2 Sec. 19, 153N, 100W

FIELD/ PROSPECT: Baker / Middle Bakken Member

COUNTY, STATE McKenzie County, North Dakota

BASIN: Williston

WELL TYPE: Middle Bakken Member Horizontal Lateral

ELEVATION: GL: 2,051'
KB: 2,076'

SPUD/ RE-ENTRY DATE: January 2, 2015 / February 20, 2015

BOTTOM HOLE LOCATION 155.94' S & 9,885.75' E of surface location or approx.
2,414.94' FNL & 276.40' FEL, SE NE Sec. 20, T153N, R100W

CLOSURE COORDINATE Closure Direction: 90.90°
Closure Distance: 9,886.98'

TOTAL DEPTH / DATE: 20,440' on February 26, 2015
77% within target interval

TOTAL DRILLING DAYS: 20 days

CONTRACTOR: Nabors #B22

PUMPS: H&H Triplex (stroke length - 12")

<u>TOOLPUSHERS:</u>	Jessie Tibbets, Mark Rollins
<u>FIELD SUPERVISORS:</u>	John Gordon, Doug Rakstad
<u>CHEMICAL COMPANY:</u>	NOV
<u>MUD ENGINEER:</u>	Joe Vaith, Joe Stander
<u>MUD TYPE:</u>	Fresh water in surface hole Diesel invert in curve; Salt water in lateral
<u>MUD LOSSES:</u>	Invert Mud: 611 bbls, Salt Water: 0 bbls
<u>PROSPECT GEOLOGIST:</u>	Nathan Gabelman
<u>WELLSITE GEOLOGISTS:</u>	Michelle Baker, G. Wayne Peterson, Zachary Moses, Molly Hagstrom
<u>GEOSTEERING SYSTEM:</u>	Sunburst Digital Wellsite Geological System
<u>ROCK SAMPLING:</u>	30' from 8,240' - 20,440' (TD)
<u>SAMPLE EXAMINATION:</u>	Binocular microscope & fluoroscope
<u>SAMPLE CUTS:</u>	Trichloroethylene (Carbo-Sol)
<u>GAS DETECTION:</u>	MSI (Mudlogging Systems, Inc.) TGC - total gas with chromatograph Serial Number(s): ML-134
<u>ELECTRIC LOGS:</u>	n/a
<u>DRILL STEM TESTS:</u>	n/a
<u>DIRECTIONAL DRILLERS:</u>	RPM, Inc. John Gordon, Doug Rakstad, Robert Jasper, Mike Bader
<u>MWD:</u>	Ryan Mike McCommend, Ronald Maddalena, Brandon Tankersley Jason Bannahhan, Matt Aesoph
<u>CASING:</u>	Surface: 13 3/8" 54# J-55 set to 2,201' Second: 9 5/8" 40# HCL-80 set to 6,050' Intermediate: 7" 32# P-110 set to 11,071'

KEY OFFSET WELLS:

Oasis Petroleum North America, LLC

Chalmers 5300 31-19H

NW SW Sec. 19 T153N R100W

McKenzie County, ND

Oasis Petroleum North America, LLC

Chalmers 5300 21-19 8T

Lot 2, Sec. 19, T153N, R100W

McKenzie County, ND

Oasis Petroleum North America, LLC

Chalmers 5300 21-19 7T2

Lot 2, Sec. 19, T153N, R101W

McKenzie County, ND

Oasis Petroleum North America, LLC

Chalmers 5301 44-24 4T2R

SE SE Sec. 24 T153N R101W

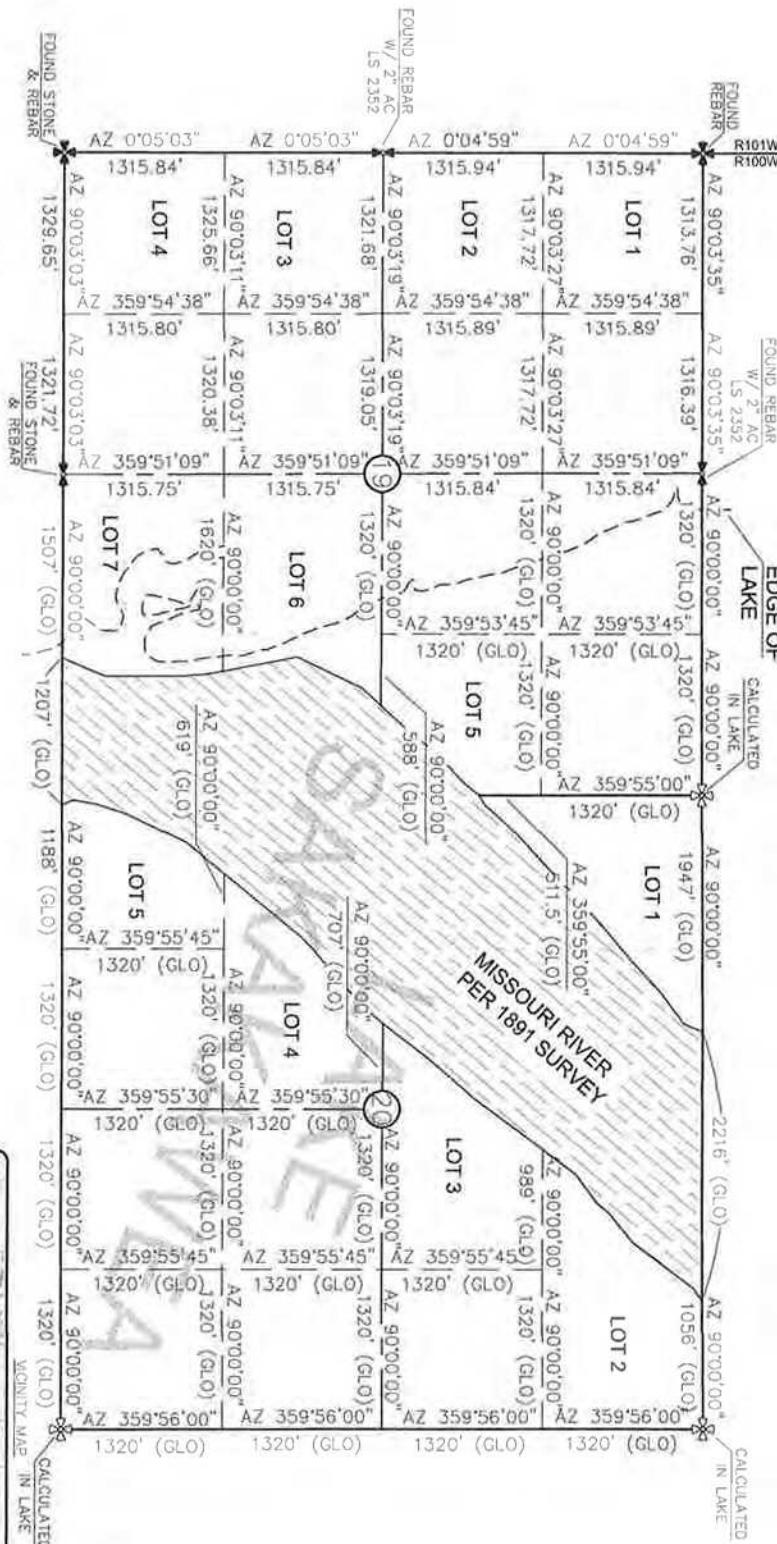
McKenzie County, ND

SECTION BREAKDOWN

OASIS PETROLEUM NORTH AMERICA, LLC
1001 LEANNIN SUITE 1500 HOUSTON TX 77003

"CHALMERS 5300 21-19 ST2"

SECTIONS 19 & 20, T153N, R100W, 5th P.M., MCKENZIE COUNTY, NORTH DAKOTA
2259 FEET FROM NORTH LINE AND 32 FEET FROM WEST LINE



ALL AZIMUTHS ARE BASED ON GPS OBSERVATIONS. THE ORIGINAL SURVEY OF THIS AREA FOR THE GENERAL LAND OFFICE (G.L.O.) WAS 1891. THE CORNERS FOUND ARE AS INDICATED AND ALL OTHERS ARE COMPUTED FROM THOSE CORNERS FOUND AND BASED ON G.L.O. DATA. THE MAPPING ANGLE FOR THIS AREA IS APPROXIMATELY 003.



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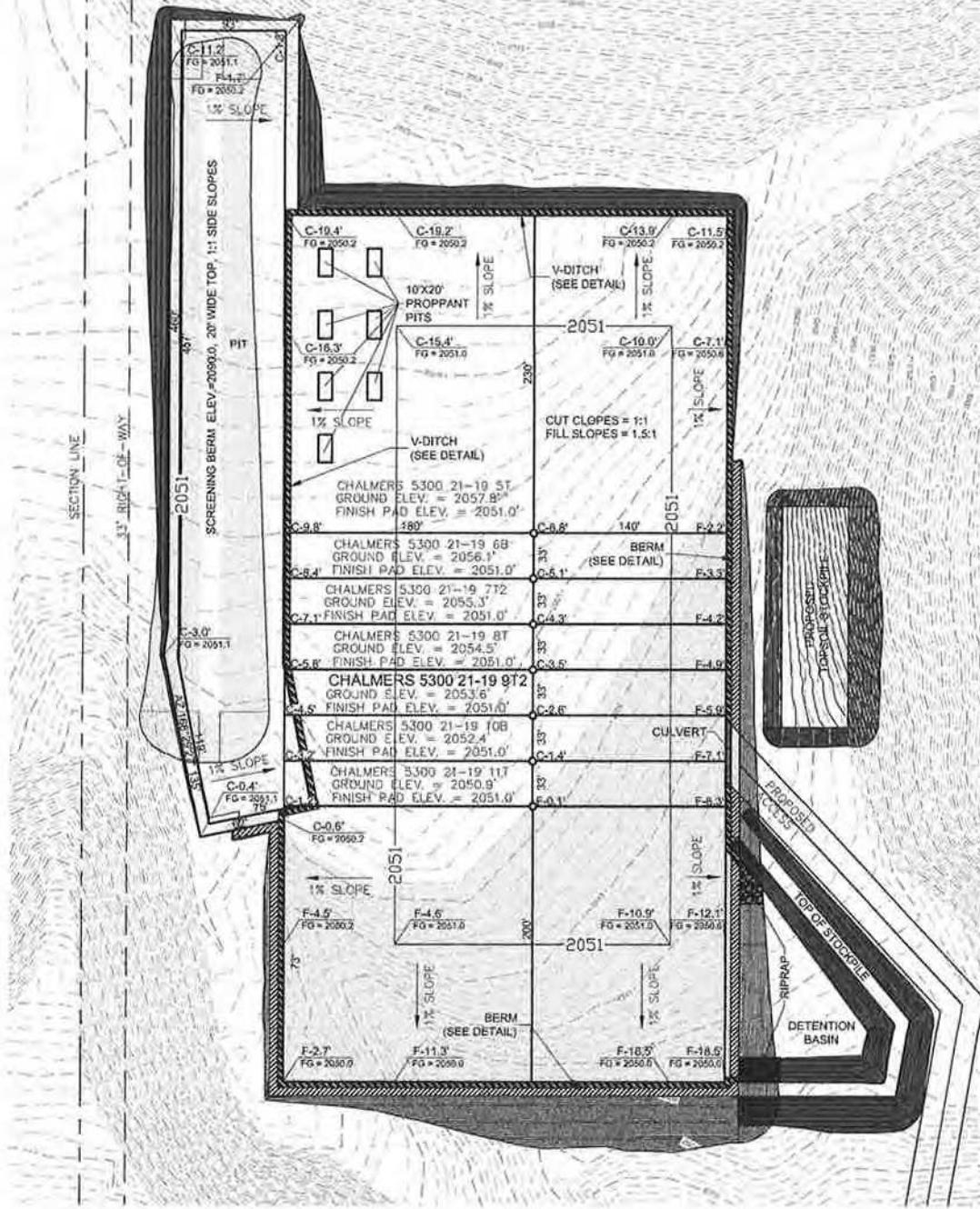
MONUMENT - RECOVERED
MONUMENT - NOT RECOVERED

THIS DOCUMENT WAS ORIGINALLY ISSUED
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CHALMERS 5300
21-19 9T?

Interstate Engineering, Inc. P.O. Box 648 425 East Main Street Sidney, Montana 59270 Ph: (406) 433-5917 Fax: (406) 433-5618 www.interstateeng.com	OASIS PETROLEUM NORTH AMERICA, LLC SECTION BREAKDOWN SECTIONS 19 & 20, T153N, R100W MCKENZIE COUNTY, NORTH DAKOTA	Reservoir No. REV # REV 3 REV 3 REV 3	Date 1/2/14 1/23/14 1/23/14 1/23/14	By MOLDS WELLS ON PAD MOLDS WELLS SHR PAD/REVISED PAD MOLDS WELLS SHR PAD/REVISED PAD MOLDS WELLS SHR PAD/REVISED PAD	Description
Drawn by: B.H.M.	Project No.: 513-005-283-04				
Checked by: D.D.S.	Date: JAN, 2014				

PAD LAYOUT
 OASIS PETROLEUM NORTH AMERICA, LLC
 1001 FANNIN, SUITE 1500, HOUSTON, TX 77002
 "CHALMERS 5300 21-19 9T2"
 2299 FEET FROM NORTH LINE AND 327 FEET FROM WEST LINE
 SECTION 19, T153N, R100W, 5th P.M., MCKENZIE COUNTY, NORTH DAKOTA



NOTE 1: Pad dimensions shown are to usable area, the v-ditch and berm areas shall be built to the outside of the pad dimensions.

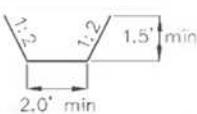
NOTE 2 : Screening berm is to be built after drilling operations are complete.

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0
1" = 80'

V-DITCH DETAIL



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

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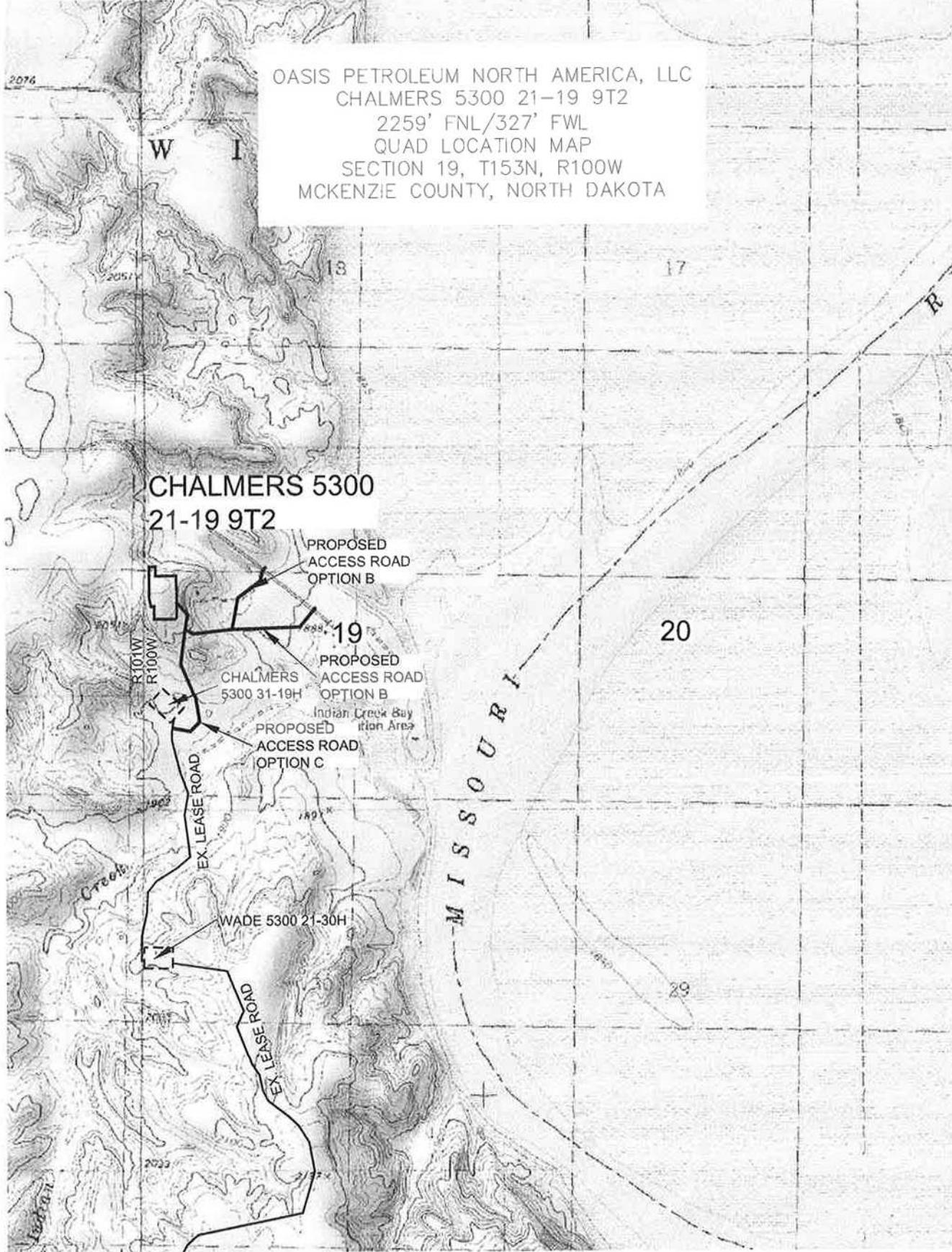


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 One Parkland Drive, North Dakota 58068

OASIS PETROLEUM NORTH AMERICA, LLC
 PAD LAYOUT
 SECTION 19, T153N, R100W
 MCKENZIE COUNTY, NORTH DAKOTA
 Drawn By: S.A.H. Project No.: 51349-282.04
 Checked By: D.D.K. Date: JAN 2014

Permit No.	Date	R.F.	Description
REC 1	2/12/14	L1	WORK WELLS ON PAD
REC 2	4/22/14	SH1	WORK WELLS ON PAD/REVISED PAD
REC 3	5/22/14	SH1	WORK WELLS ON PAD/REVISED PAD



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**INTERSTATE
ENGINEERING**

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Professional's seal required, please sign your map

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Other offices in Billings, Bozeman, Great Falls and Spokane, Canada

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

Drawn By:	B.H.J.E.	Project No.:	S13-09-282-04
Checked By:	D.D.K.	Date:	JAN, 2014

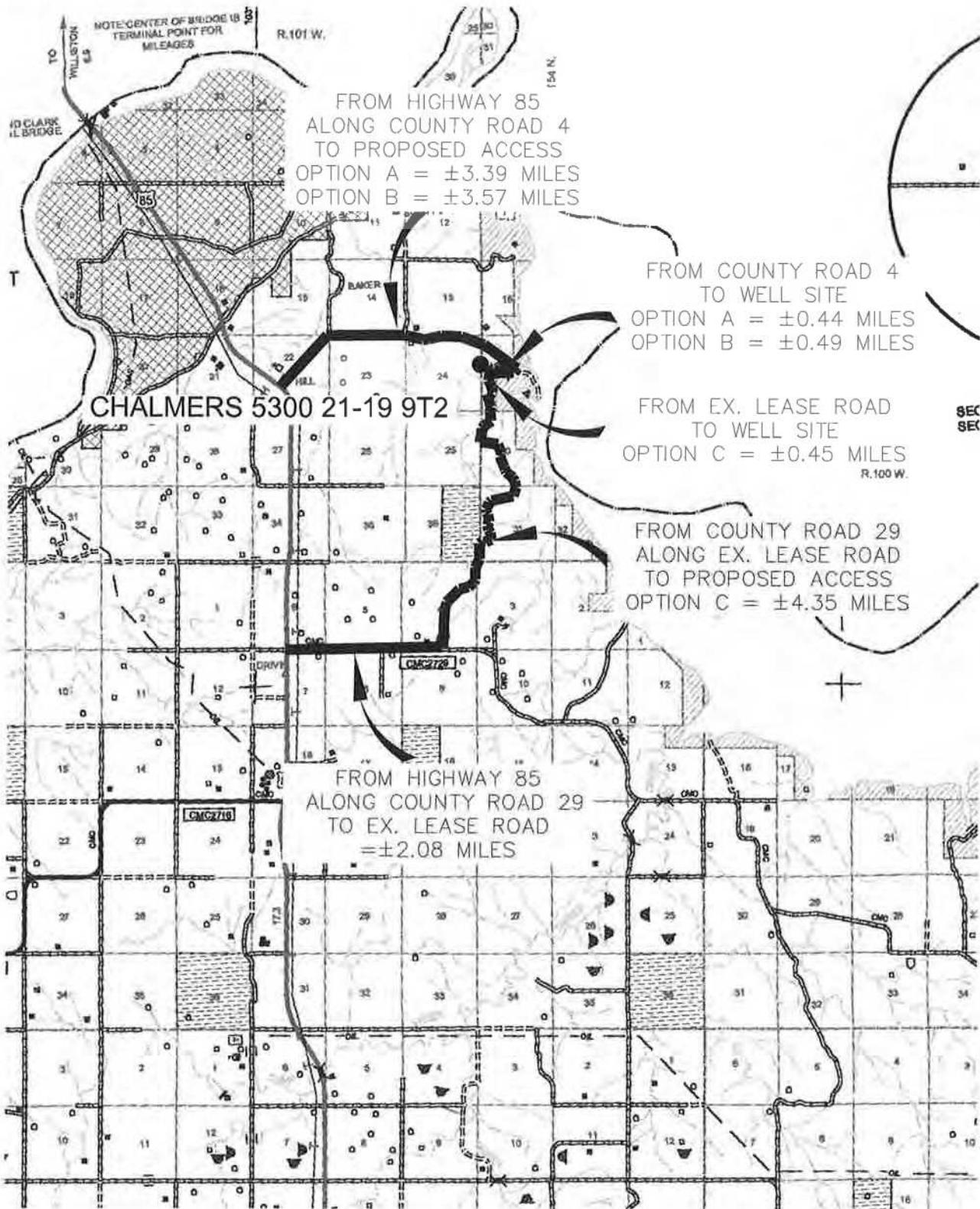
Revision No.	Date	By	Description
REV. 1	3/12/14	JHS	Moved wells on pad
REV. 2	4/22/14	BHH	Moved wells on pad/revised pad
REV. 3	5/2/14	BHH	Moved wells on pad/revised pad

COUNTY ROAD MAP

OASIS PETROLEUM NORTH AMERICA, LLC
1001 FANNIN, SUITE 1500, HOUSTON, TX 77002

"CHALMERS 5300 21-19 9T2"

2259 FEET FROM NORTH LINE AND 327 FEET FROM WEST LINE
SECTION 19, T153N, R100W, 5th P.M., MCKENZIE COUNTY, NORTH DAKOTA



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Office Locations in Montana, North Dakota and South Dakota

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

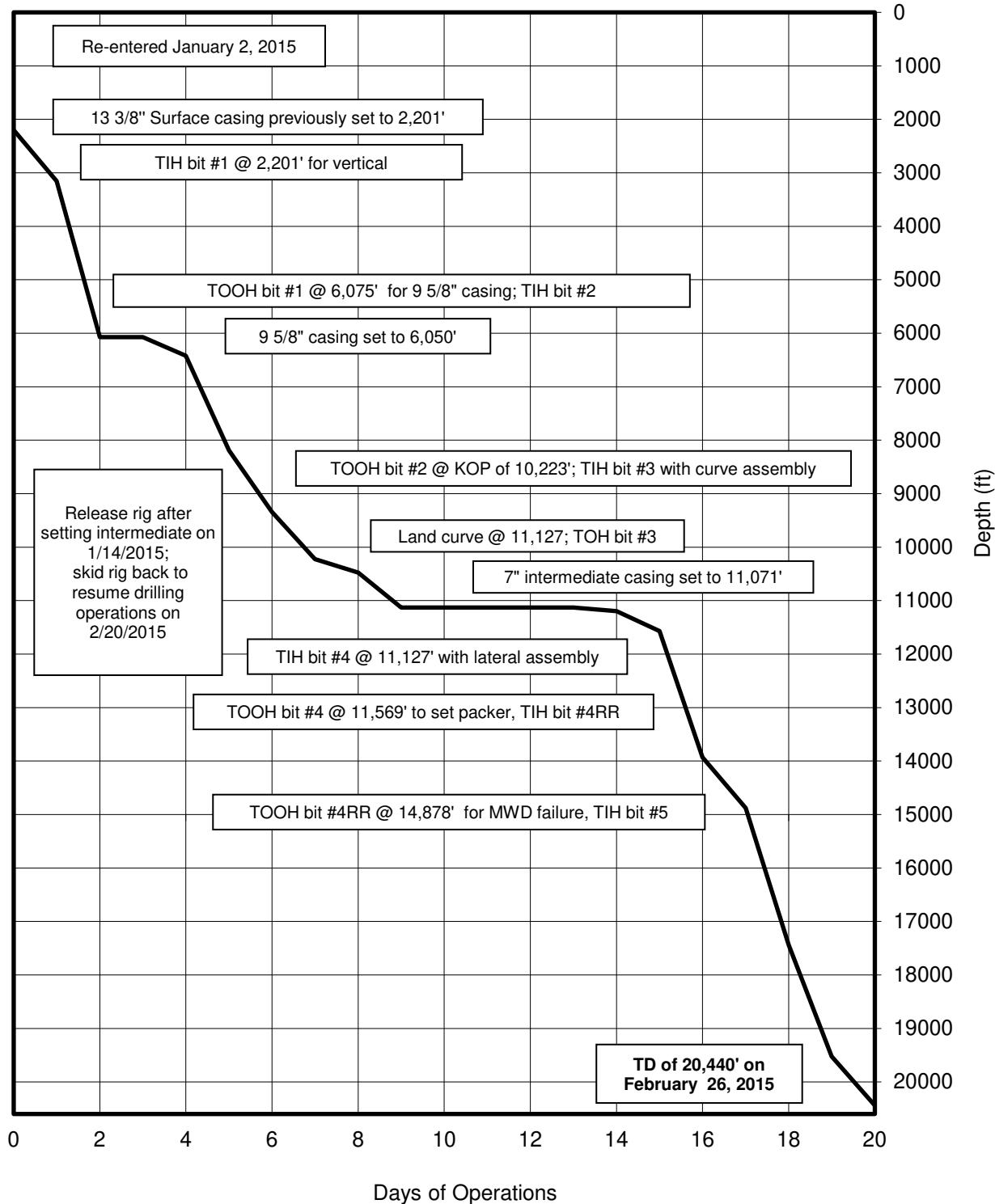
MCKENZIE COUNTY, NORTH DAKOTA

Drawn By:	B.H.H.	Project No.:	S13-09-282.04
Checked By:	D.D.K.	Date:	JAN. 2014

Revision No.	Date	By	Description
REV 1	5/12/14	AB	MOVED WELLS ON PAD
REV 2	4/22/14	BBH	MOVED WELLS ON PAD/REVISED PAD
REV 3	5/2/14	BBH	MOVED WELLS ON PAD/REVISED PAD

TIME VS DEPTH

Oasis Petroleum North America, LLC
Chalmers 5300 21-19 9B



DAILY DRILLING SUMMARY

Day	Date 2015	Depth (0600 Hrs)	24 Hr Footage	Bit #	WOB (Klbs) RT	RPM (RT)	WOB (Klbs) MM	RPM (MM)	PP	SPM 1	SPM 2	GPM	24 Hr Activity		Formation
0	1/2	2,201'	-	-	-	-	-	-	-	-	-	-	Rig accepted on company time @ 2300 1/1/2015, Nipple up BOPSS.		Surface
1	1/3	3,157'	956	1	15	55	-	-	2,750	95	95	669	Test BOPSS. Rig down BOP Tester. Install wear bushing. Hook up camps to rig power. Cut drilling line. Service rig. Put BHA, pipe on pipe racks. Pick up BHA, bit, motor, UBHO, monel. Drilling cement @ 2,145', float @ 2,157', shoe @ 2,201'. Fit test. Drill 2,223'-3,157'.		Pierre
2	1/4	6,075'	2,918	1	15	35	-	-	3,650	95	95	669	Drill 3,157'-4,744'. Service rig. Rotary drilling sliding as needed 4,744'-4,837'. Rotary drilling sliding as needed 4,837'-5,584'. Service rig.		Dakota
3	1/5	6,075'	0	-	-	-	-	-	-	-	-	-	Circulate and condition, circulate bottoms up. Short trip 1,000'. Circulate and condition, circulate bottoms up. Pump dry job. TOH. Flow check. Remove rotating head. Install trip nipple. TOH. Lay down BHA, MWD, Drain motor. Rack back BHA. Service rig. Down time catwalk. Rig up to run casing, hold safety meeting. Run 9 5/8" casing. Verify land with Weatherford. Circulate and condition.		Dakota
4	1/6	6,419'	344	2	15	55	-	-	3,250	78	78	548	Rig up cementers. Hold safety meeting. Circulate casing. Wait on bell extensions. Cement. Rig down cementers. Rig down cements. Lay down landing joint, bell extensions, casing elevators. Install 5" elevators. Weatherford install packoff. Set packoff and wear bushing with Weatherford. Pick up BHA, TH. Drilling cement 6,06'-6,085' float @ 6,008', shoe @ 6,050'. Fit test. Drill 6,085'-6,419'.		Dakota
5	1/7	8,193'	1,774	2	22	55	20	142	3300	78	78	590	Rotary drilling from 6,419'-7,259', service rig, moved kelly hose, slow pump rates 40STK@ 7,259 375psi, closed pipes, rotary drilling from 7,259'-8,193'.		Otter
6	1/8	9,344'	1,151	2	39	65	-	140	3650	82	82	584	Drill from 8,193'-8,660'. Service rig. Drill from 8,660'-9,344'. Service rig.		Charles
7	1/9	10,223'	879	2	40	65	-	135	3750	80	80	563	Drill from 9,344'-9,687'. Service rig. Drill from 9,687'-10,123' Service rig.		Lodgepole
8	1/10	10,475'	252	3	29	25	23	147	3150	72	72	507	Removed rotating heads. Installed trip nipple. TOOH. Lay down BHA, motor, bit. Pick up BHA, motor, pony. Service rig. Activated blinds 7 seconds. Multi-shot surveys. Rig up wire line. Bond log. Rig down wireline. Pick up BHA, bit, MWD. TH. Orientate curve from 10,223'-10,475'.		Lodgepole
9	1/11	11,127'	652	3	14	25	30	151	3600	74	74	521	Orientate curve from 10,475'-10,755'. Service rig. Drill and survey curve from 10,755'-11,127'. Circulate bottoms up. TOOH. Prepare to set intermediate casing.		Middle Bakken

DAILY DRILLING SUMMARY

Day	Date 2015	Depth (0600 Hrs)	24 Hr Footage	Bit #	WOB (Klbs) RT	RPM (RT)	WOB (Klbs) MM	RPM (MM)	PP	SPM 1	SPM 2	GPM	24 Hr Activity		Formation
10	1/12	11,127'	0	-	-	-	-	-	-	-	-	-	TOOH. Lay down BHA. Remove wear bushing. Rig up caing crew. Hold pre-job safety meeting. Make up shoe track. Service rig. Run 7" casing. Wash down casing from 10,698'-11,087'. Circulate and condition.		Middle Bakken
11	1/13	11,127'	0	-	-	-	-	-	-	-	-	-	Circulate and condition. Rig up cementers. Pump cement. Primary cementing. Circulate and condition. Pump truck packed off, pump 30 bbls fresh water then switch to invert and circulate cement out. Pressure cement head to 10,000 psi. Shut in and wait on oil base mud.		Middle Bakken
12	1/14	11,127'	0	-	-	-	-	-	-	-	-	-	Bleed pressure off casing to get back lost invert. Rig down casing. Rig up winches with Greenies. Wait on Greenies to replace hose. Hook winch to BOP. Pick up BOP. Set casing slips with Weatherford. Cut and bevel casing. Set BOP. Rig down Greenies winch. Rig released at 1800 hrs 1/14/15.		Middle Bakken
13	2/20	11,127'	0	-	-	-	-	-	-	-	-	-	Nipple down. Skid rig. Rig up. Test BOPs. Rig accepted to Chalmers 5300 21-19 9B at 05:30 hrs on 2/20/15.		Middle Bakken
14	2/21	11,195'	68	4	10	50	10	312	3000	-	86	303	Nipple up BOPs. Test BOPs flowline. Service rig. Pick up BHA. TIH. Manual set deviation tool. Pressure test casing, shoe, 1500 psi for 30 min. no drop in pressure, good test. Displace to water base. Service top drive, function upper rams. Drill cement. Drill out float at 10,990' and shoe at 11,071'. Drill ahead to 11,145'. FIT; bad test. Drill and survey lateral from 11,145'-11,195'.		Middle Bakken
15	2/22	11,569'	374	4RR	6	50	10	327	3500	-	90	317	Drill and survey lateral form 11,195'-11,569'. Mandatory trip to set packer due to failed formation integrity test. Mix and send dry job. TOH, remove RHR and install trip nipple. Lay down BHA. Pick up 3rd party tools, Weatherford packer. Service rig. TIH. Set Weatherford packer, casing test to 1500 psi for 30 min. TOH. Cut drilling line. Service top drive. TIH.		Middle Bakken
16	2/23	13,930'	2,361	4RR	20	40	35	298	3700	-	82	289	TIH, remove trip nipple and install RHR. Change 4" quill. Drill and survey lateral from 11,569'-11,600'. Drills-BOP etc. functioned annular (6 sec.). Circulate and condition, circulate out gas. Drill and survey lateral from 11,600'-12,425'. Service rig. Drill and survey lateral from 12,425'-13,930'. Service top drive.		Middle Bakken
17	2/24	14,878'	948	5	20	40	35	298	3700	-	82	289	Drill and survey lateral from 13,930'-14,878'. Recycle pumps for MWD. Circulate and condition, build dry job. Hold safety meeting. TOH for MWD tool. Pick up new BHA. TIH.		Middle Bakken
18	2/25	17,437'	2,559	5	15	35	45	290	4000	-	80	282	Drill and survey lateral from 14,878'-15,636'. Service rig. Drill and survey lateral from 15,636'-16,679'. Rig service. Drill and survey from 16,679'-17,437'.		Middle Bakken

DAILY DRILLING SUMMARY

Day	Date 2015	Depth (0600 Hrs)	24 Hr Footage	Bit #	WOB (Klbs) RT	RPM (RT)	WOB (Klbs) MM	RPM (MM)	PP	SPM 1	SPM 2	GPM	24 Hr Activity		Formation
19	2/26	19,522'	2,085	5	14	35	80	275	4000	-	76	267	Drill and survey from 17,437'-18,101'. Service rig. Drill and survey from 18,954'-19,522'.	Middle Bakken	
20	2/27	20,440'	918	5	20	35	80	275	3700	-	76	267	Drill and survey, sliding as needed, from 19,522'-20,440'. The Oasis Chalmers 5300 21-19 9B reached a TD of 20,440' at 16:40 hours on February 26, 2015.	Middle Bakken	

DAILY MUD SUMMARY

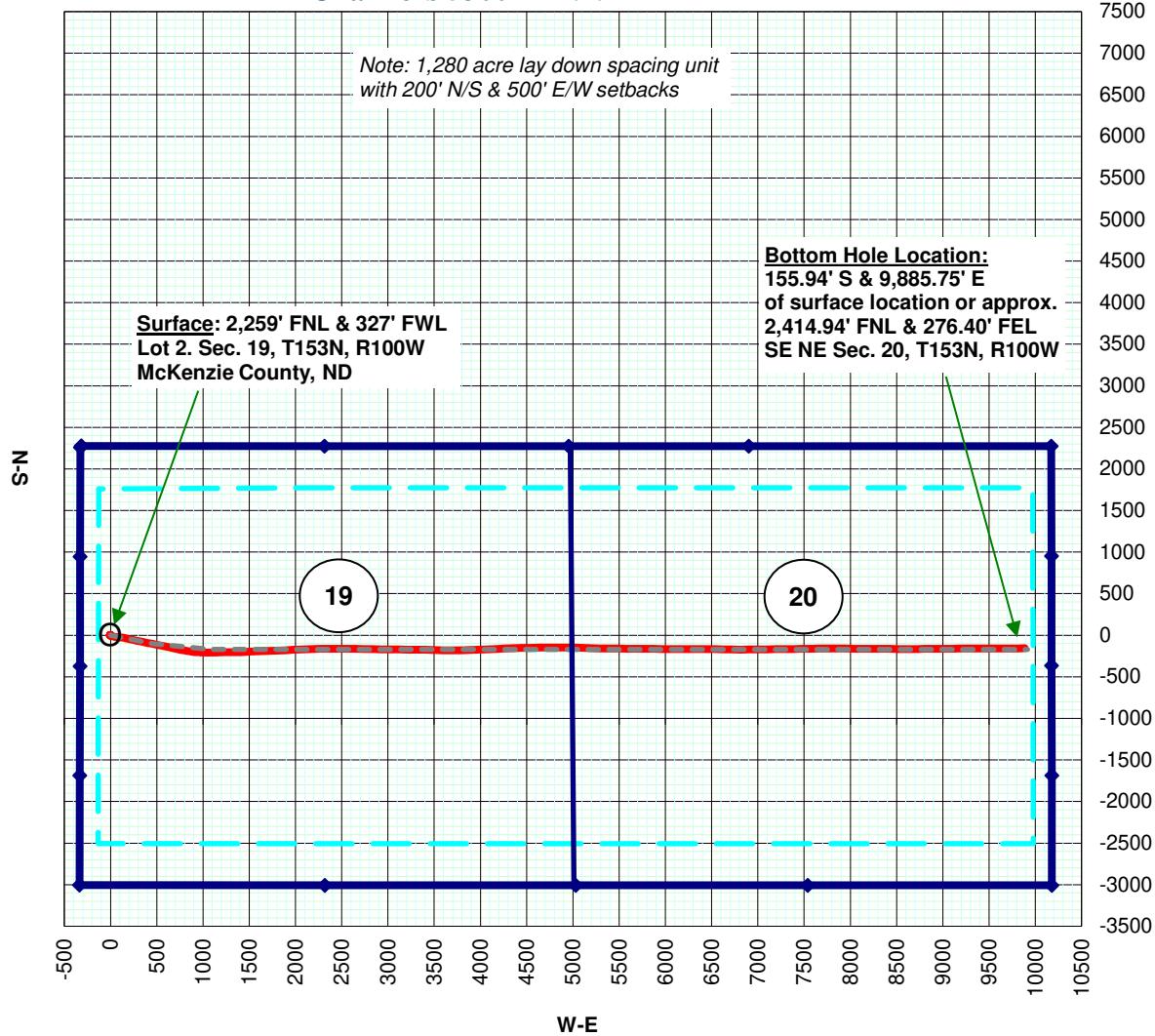
Day	Date 2015	Mud Depth	Drilling Fluid	Mud WT (ppg)	Vis (sec/ qt)	PV (cP)	YP (lbs/ 100 ft ²)	Gels (lbs/ 100 ft ²)	600/ 300 (ratio)	NAP / H ₂ O (% by vol)	NAP / H ₂ O (API/ HTHP)	Cake Solids (%)	Cor. Alk	pH	Excess Lime (lb/bbl)	Cr (mg/L)	HGS/ LGS (%)	Salinity (ppm)	Electrical Stability	Gain/ Loss (bbls)	
0	01/02	2,201'	invert	11.4	85	16	8	7/10/13	40/24	82.9/117.1	68/14	2	16.1	1.2	-	1.6	33k	14.1/2.1	264,320	405	-
1	01/03	3,157'	invert	11.3	47	15	6	7/9/11	36/21	78.3/21.7	65/18	2	15.5	1	-	1.3	25k	13.5/2.0	186,257	387	-/22
2	01/04	6,075'	invert	11.3	47	15	6	7/9/11	36/21	78.3/21.7	65/18	2	15.5	1	-	1.3	25k	13.5/2.0	186,257	387	-/-
3	01/05	6,075'	invert	10.6	53	16	9	9/11/14	41/25	81.4/18.6	70/16	2	12.8	2.4	-	3.1	20k	11.6/1.2	170,813	507	-/-
4	01/06	6,419'	invert	10.6	53	16	9	9/11/14	41/25	81.4/18.6	70/16	2	12.8	2.4	-	3.1	20k	11.6/1.2	170,813	507	-/71
5	01/07	6,732'	invert	10.6	53	16	9	9/11/14	41/25	81.4/18.6	70/16	2	12.8	2.4	-	3.1	20k	11.6/1.2	170,813	507	-/280
6	01/08	8,550'	invert	10.1	52	18	2	6/9/10	42/24	82.6/17.4	71/15	2	12.5	2	-	2.6	25k	8.2/4.3	215,481	498	-120
7	01/09	10,223'	invert	10.4	42	11	9	7/9/11	31/20	83.3/16.7	70/14	2	14.1	3	-	3.9	35k	8.9/5.2	264,320	610	-/45
8	01/10	10,715'	invert	10.5	49	12	10	8/11/14	34/22	89.3/10.7	75/9	2	14.8	3	-	3.9	35k	10.1/4.7	264,320	703	-/38
9	01/11	11,127'	invert	10.35	48	13	10	8/11/13	36/23	80/20	68/17	2	12.9	2.3	-	3	35k	8.8/4.1	242,679	537	-/35
10	01/12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
11	01/13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
12	01/14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
13	02/20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
14	02/21	11,195'	salt water	9.65	28	2	1	-	5/3	-	0/90.6	-	9.4	-	9	-	162	-/0.2	-	-	-/-
15	02/22	11,569'	salt water	9.7	28	2	1	-	5/3	-	0/90.6	-	9.4	-	9	-	162	-/0.2	-	-	-/-
16	02/23	13,930'	salt water	9.65	28	2	1	-	5/3	-	0/90.6	-	9.4	-	9	-	162	-/0.2	-	-	-/-
17	02/24	14,878'	salt water	10.2	30	2	1	-	5/3	-	4/85	-	11	-	9	-	208K	-/1.3	-	-	-/-
18	02/25	17,437'	salt water	10.2	30	2	1	-	5/3	-	4/85	-	11	-	9	-	208K	-/1.3	-	-	-/-
19	02/26	19,522'	salt water	10.1	34	2	1	-	5/3	-	3/83	-	14	-	8	-	210K	-/2.4	-	-	-/-

BOTTOM HOLE ASSEMBLY RECORD

BHA Run	Depth In	Depth Out	Footage	Hours	Accum. Hours	Vert. Dev.	Bit Data						Motor Data				
							Bit #	Size (in.)	Type	Make	Model	Serial #	Jets	Hours	Motor #	Make	Model
1	2,201'	6,075'	3,874'	29	29.00	Vertical	1	12 1/4	PDC	Varel	V619PD	4008019	5x20	29	1	NOV	6/5 5.0
2	6,075'	10,223'	4,148'	70	99.00	Vertical	2	8 3/4	PDC	Varel	R616PDG2UX	4006757	5x20	70	2	Hunting	7/8 5.7
3	10,223'	11,127'	904'	24	123.00	Curve	3	8 3/4	PDC	Security	MMD55M	12529693	6x20	24	3	NOV	7/8 5.0
4	11,127'	11,569'	442'	6	129.00	lateral	4	6	PDC	Baker	T406	7149149	6x18	6	4	Baker	XLP 5/6 5.0
5	11,569'	14,878'	3,309'	33	162.00	lateral	4RR	6	PDC	Baker	T406	7149149	6x18	33	4RR	Baker	XLP 5/6 5.0
6	14,878'	20,440'	5,562'	56	218.00	Lateral	5	6	PDC	NOV	SK516M-A1	A205143	5x20	56	5	Baker	XLP 5/6 5.0

PLAN VIEW

Oasis Petroleum North America, LLC
Chalmers 5300 21-19 9B

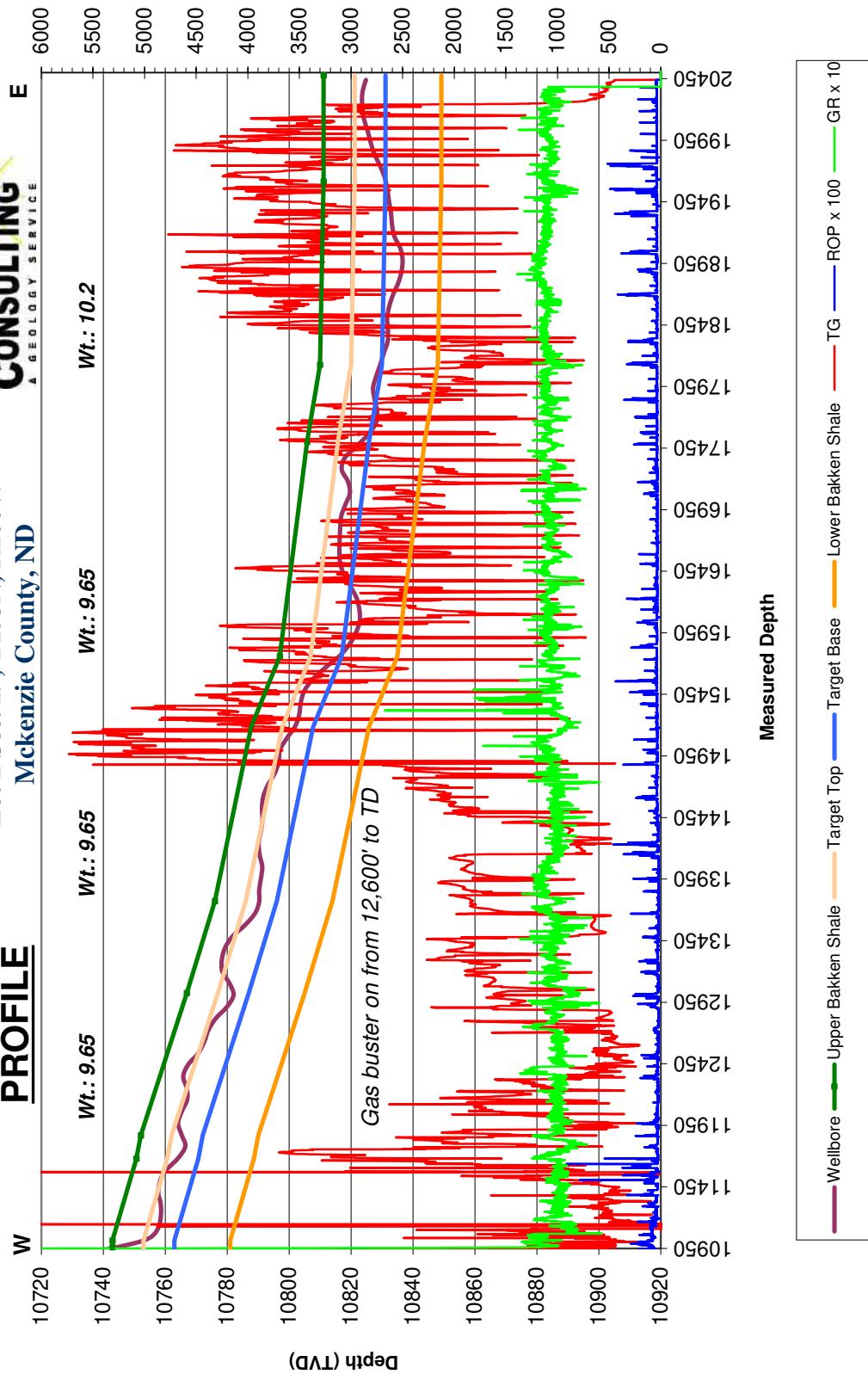


Oasis Petroleum North America, LLC
 Chalmers 5300 21-19 9B
 Lot 2 Sec. 19, T153N, R100W
 Mckenzie County, ND



PROFILE

Total Gas, ROP x 100, Gamma Ray x 10

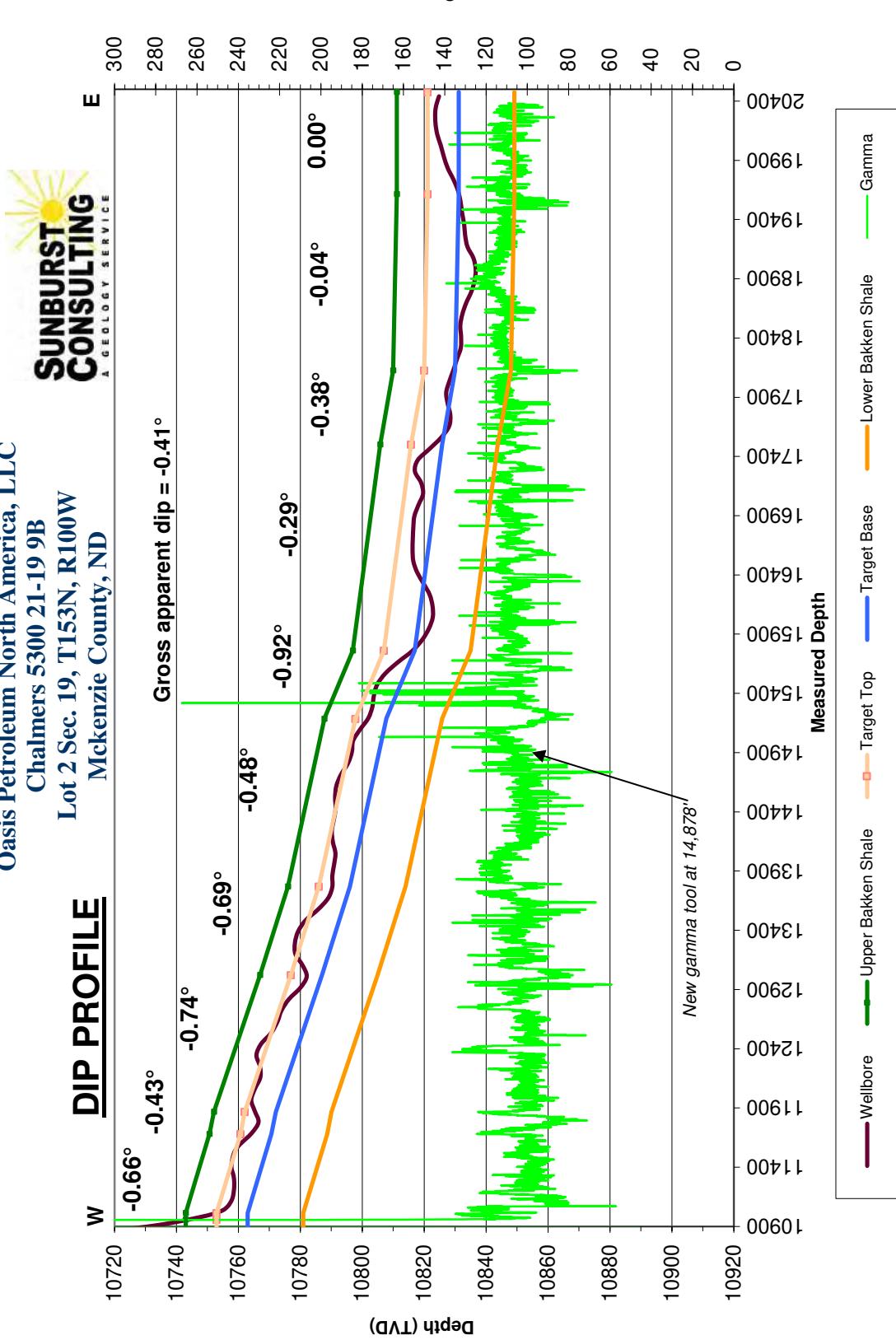


FORMATION MARKERS & DIP ESTIMATES

Oasis Petroleum North America, LLC - Chalmers 5300 21-19 9B

Dip Change Points	MD	TVD	TVD diff.	MD diff.	Dip	Dipping up/down	Type of Marker
Marker							
Target entry	11,013'	10,753.00					Gamma
Target top marker	11,680'	10,760.70	7.70	667.00	-0.66	Down	Gamma
Target top marker	11,867'	10,762.10	1.40	187.00	-0.43	Down	Gamma
Middle target cool marker	13,022'	10,777.01	14.91	1155.00	-0.74	Down	Gamma
Middle target cool marker	13,769'	10,786.00	8.99	747.00	-0.69	Down	Gamma
Middle target cool marker	15,185'	10,797.80	11.80	1416.00	-0.48	Down	Gamma
Target bottom marker	15,760'	10,807.00	9.20	575.00	-0.92	Down	Gamma
Target bottom marker	17,500'	10,815.81	8.81	1740.00	-0.29	Down	Gamma
Target bottom marker	18,125'	10,820.00	4.19	625.00	-0.38	Down	Gamma
Target bottom marker	19,615'	10,821.17	1.17	1490.00	-0.04	Down	Gamma
Middle target cool marker	20,440'	10,821.17	0.00	825.00	0.00	Down	Gamma
Gross Dip							
Initial Target Contact	11,013'	10,753.00					
Projected Final Target Contact	20,440'	10,821.17	68.17	9427.00	-0.41	Down	Gamma

Oasis Petroleum North America, LLC
 Chalmers 5300 21-19 9B
 Lot 2 Sec. 19, T153N, R100W
 Mckenzie County, ND



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SUNBURST CONSULTING, INC.

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Operator:	Oasis Petroleum North America, LLC	
Well :	Chalmers 5300 21-19 9B	
County:	Mckenzie	State: ND
QQ:	Lot 2	Section: 19
Township:	153	N/S: N
Range:	100	E/W: W
Footages:	2259	FN/SL: N
	327	FE/WL: W

Kick-off:	1/9/2015
Finish:	2/26/2015
Directional Supervision:	Ryan Directional Services

Date: 3/5/2015
 Time: 9:05
F9 to re-calculate

Proposed dir: 90

Minimum Curvature Method (SPE-3362)

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

No.	MD	INC	TRUE				SECT	DLS/ 100
			AZM	TVD	N-S	E-W		
Tie	2150.00	0.50	160.10	2149.94	-6.83	5.47	5.47	
1	2236.00	0.60	156.80	2235.94	-7.60	5.78	5.78	0.12
2	2267.00	0.80	151.30	2266.93	-7.94	5.94	5.94	0.68
3	2361.00	0.70	20.20	2360.93	-7.97	6.46	6.46	1.45
4	2454.00	0.70	14.50	2453.92	-6.89	6.79	6.79	0.07
5	2547.00	0.40	359.30	2546.92	-6.01	6.93	6.93	0.36
6	2641.00	0.40	0.40	2640.92	-5.36	6.93	6.93	0.01
7	2734.00	0.40	350.00	2733.91	-4.71	6.88	6.88	0.08
8	2828.00	0.50	330.40	2827.91	-4.03	6.62	6.62	0.19
9	2921.00	0.50	324.90	2920.91	-3.35	6.18	6.18	0.05
10	3014.00	0.60	322.50	3013.90	-2.63	5.65	5.65	0.11
11	3108.00	0.60	323.30	3107.90	-1.85	5.06	5.06	0.01
12	3201.00	0.70	328.60	3200.89	-0.97	4.47	4.47	0.13
13	3294.00	0.60	311.10	3293.89	-0.17	3.81	3.81	0.24
14	3388.00	0.50	311.00	3387.88	0.43	3.13	3.13	0.11
15	3481.00	0.50	321.20	3480.88	1.01	2.57	2.57	0.10
16	3575.00	0.40	308.90	3574.88	1.53	2.06	2.06	0.15
17	3668.00	0.40	317.70	3667.87	1.98	1.59	1.59	0.07
18	3761.00	0.30	297.20	3760.87	2.33	1.15	1.15	0.17
19	3855.00	0.30	285.00	3854.87	2.51	0.69	0.69	0.07
20	3948.00	0.20	307.70	3947.87	2.67	0.33	0.33	0.15
21	4041.00	0.30	279.70	4040.87	2.81	-0.04	-0.04	0.17
22	4135.00	0.40	294.20	4134.87	2.98	-0.58	-0.58	0.14
23	4228.00	0.40	276.20	4227.86	3.15	-1.20	-1.20	0.13
24	4321.00	0.30	242.90	4320.86	3.08	-1.74	-1.74	0.24
25	4415.00	0.40	238.10	4414.86	2.79	-2.24	-2.24	0.11
26	4508.00	0.50	253.70	4507.86	2.51	-2.90	-2.90	0.17
27	4601.00	0.50	252.90	4600.85	2.27	-3.68	-3.68	0.01
28	4695.00	0.70	258.80	4694.85	2.04	-4.63	-4.63	0.22
29	4788.00	0.70	232.60	4787.84	1.59	-5.64	-5.64	0.34
30	4882.00	0.60	234.00	4881.84	0.95	-6.50	-6.50	0.11
31	4975.00	0.70	236.30	4974.83	0.35	-7.36	-7.36	0.11
32	5068.00	0.60	77.10	5067.83	0.14	-7.36	-7.36	1.38
33	5162.00	0.60	76.30	5161.82	0.37	-6.40	-6.40	0.01
34	5255.00	0.70	67.30	5254.82	0.70	-5.41	-5.41	0.15

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SUNBURST CONSULTING, INC.

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Operator:	Oasis Petroleum North America, LLC	
Well :	Chalmers 5300 21-19 9B	
County:	Mckenzie	State: ND
QQ:	Lot 2	Section: 19
Township:	153	N/S: N
Range:	100	E/W: W
Footages:	2259	FN/SL: N
	327	FE/WL: W

Kick-off:	1/9/2015
Finish:	2/26/2015
Directional Supervision:	Ryan Directional Services

Date: 3/5/2015
 Time: 9:05
F9 to re-calculate

Proposed dir: 90

Minimum Curvature Method (SPE-3362)

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

No.	MD	INC	TRUE				SECT	DLS/ 100
			AZM	TVD	N-S	E-W		
35	5348.00	0.60	55.20	5347.81	1.20	-4.48	-4.48	0.18
36	5442.00	0.40	69.50	5441.81	1.59	-3.77	-3.77	0.25
37	5535.00	0.50	57.50	5534.81	1.93	-3.12	-3.12	0.15
38	5628.00	0.40	25.00	5627.80	2.44	-2.64	-2.64	0.29
39	5722.00	0.60	59.70	5721.80	2.98	-2.08	-2.08	0.38
40	5815.00	0.40	73.60	5814.80	3.32	-1.35	-1.35	0.25
41	5908.00	0.40	87.10	5907.79	3.43	-0.71	-0.71	0.10
42	6001.00	0.30	108.20	6000.79	3.37	-0.16	-0.16	0.17
43	6026.00	0.30	73.10	6025.79	3.37	-0.03	-0.03	0.72
44	6089.00	0.10	43.40	6088.79	3.46	0.16	0.16	0.35
45	6182.00	0.30	62.70	6181.79	3.63	0.43	0.43	0.22
46	6276.00	0.30	54.00	6275.79	3.88	0.85	0.85	0.05
47	6369.00	0.10	355.60	6368.79	4.11	1.04	1.04	0.28
48	6463.00	0.20	214.30	6462.79	4.05	0.94	0.94	0.30
49	6556.00	0.50	225.80	6555.79	3.64	0.56	0.56	0.33
50	6649.00	0.70	217.00	6648.78	2.90	-0.07	-0.07	0.24
51	6743.00	0.80	206.70	6742.77	1.86	-0.71	-0.71	0.18
52	6836.00	1.10	216.30	6835.76	0.56	-1.53	-1.53	0.36
53	6929.00	0.40	247.20	6928.75	-0.29	-2.36	-2.36	0.84
54	7023.00	0.40	252.70	7022.75	-0.51	-2.97	-2.97	0.04
55	7116.00	0.50	249.30	7115.75	-0.75	-3.66	-3.66	0.11
56	7209.00	0.00	67.90	7208.75	-0.90	-4.04	-4.04	0.54
57	7303.00	0.30	114.90	7302.75	-1.00	-3.82	-3.82	0.32
58	7396.00	0.30	166.90	7395.74	-1.34	-3.54	-3.54	0.28
59	7489.00	0.50	248.00	7488.74	-1.73	-3.87	-3.87	0.58
60	7583.00	0.60	252.10	7582.74	-2.03	-4.71	-4.71	0.11
61	7676.00	0.60	260.20	7675.73	-2.27	-5.66	-5.66	0.09
62	7769.00	0.60	20.30	7768.73	-1.89	-5.97	-5.97	1.12
63	7863.00	0.40	4.20	7862.73	-1.10	-5.77	-5.77	0.26
64	7956.00	0.20	356.60	7955.73	-0.62	-5.76	-5.76	0.22
65	8050.00	0.50	248.70	8049.72	-0.60	-6.15	-6.15	0.63
66	8143.00	0.40	109.60	8142.72	-0.86	-6.22	-6.22	0.91
67	8236.00	0.40	102.70	8235.72	-1.04	-5.60	-5.60	0.05
68	8330.00	0.30	99.10	8329.72	-1.15	-5.04	-5.04	0.11
69	8423.00	0.40	120.20	8422.72	-1.35	-4.52	-4.52	0.17

SUNBURST CONSULTING, INC.

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Operator:	Oasis Petroleum North America, LLC	
Well :	Chalmers 5300 21-19 9B	
County:	Mckenzie	State: ND
QQ:	Lot 2	Section: 19
Township:	153	N/S: N
Range:	100	E/W: W
Footages:	2259	FN/SL: N
	327	FE/WL: W

Kick-off:	1/9/2015
Finish:	2/26/2015
Directional Supervision:	Ryan Directional Services

Date: 3/5/2015
 Time: 9:05
F9 to re-calculate

Proposed dir: 90

Minimum Curvature Method (SPE-3362)

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

No.	MD	INC	TRUE				SECT	DLS/ 100
			AZM	TVD	N-S	E-W		
70	8516.00	0.60	115.40	8515.71	-1.73	-3.80	-3.80	0.22
71	8610.00	0.90	63.80	8609.71	-1.61	-2.69	-2.69	0.75
72	8703.00	0.80	67.10	8702.70	-1.04	-1.44	-1.44	0.12
73	8796.00	0.90	60.50	8795.69	-0.42	-0.20	-0.20	0.15
74	8890.00	0.70	57.60	8889.68	0.25	0.93	0.93	0.22
75	8983.00	0.70	54.60	8982.67	0.88	1.87	1.87	0.04
76	9076.00	0.60	35.60	9075.66	1.61	2.61	2.61	0.25
77	9170.00	0.50	48.50	9169.66	2.28	3.21	3.21	0.17
78	9263.00	0.50	31.50	9262.66	2.89	3.72	3.72	0.16
79	9357.00	0.30	57.40	9356.65	3.38	4.15	4.15	0.28
80	9450.00	0.20	18.80	9449.65	3.66	4.40	4.40	0.20
81	9543.00	0.70	204.50	9542.65	3.30	4.22	4.22	0.97
82	9637.00	0.80	195.40	9636.64	2.14	3.81	3.81	0.17
83	9730.00	0.80	200.50	9729.63	0.91	3.41	3.41	0.08
84	9824.00	0.80	198.60	9823.63	-0.33	2.97	2.97	0.03
85	9917.00	0.80	196.70	9916.62	-1.57	2.57	2.57	0.03
86	10010.00	0.70	209.90	10009.61	-2.68	2.11	2.11	0.21
87	10104.00	0.50	209.00	10103.60	-3.54	1.62	1.62	0.21
88	10173.00	0.40	206.80	10172.60	-4.02	1.37	1.37	0.15
89	10228.00	0.30	216.00	10227.60	-4.30	1.19	1.19	0.21
90	10259.00	1.70	114.40	10258.60	-4.56	1.57	1.57	5.76
91	10290.00	6.40	107.70	10289.51	-5.27	3.63	3.63	15.21
92	10321.00	11.00	107.80	10320.14	-6.70	8.10	8.10	14.84
93	10352.00	14.70	115.00	10350.36	-9.27	14.48	14.48	12.98
94	10384.00	18.90	113.60	10380.99	-13.06	22.91	22.91	13.18
95	10415.00	22.20	106.30	10410.02	-16.72	33.14	33.14	13.46
96	10446.00	25.50	98.50	10438.38	-19.35	45.37	45.37	14.70
97	10477.00	27.80	96.80	10466.08	-21.19	59.15	59.15	7.82
98	10508.00	29.60	95.90	10493.27	-22.84	73.94	73.94	5.97
99	10539.00	31.30	94.70	10520.00	-24.28	89.58	89.58	5.82
100	10570.00	34.80	96.50	10545.98	-25.95	106.40	106.40	11.72
101	10601.00	38.50	99.60	10570.85	-28.56	124.71	124.71	13.34
102	10633.00	43.10	102.20	10595.06	-32.53	145.23	145.23	15.32
103	10664.00	47.60	103.20	10616.85	-37.39	166.74	166.74	14.70
104	10695.00	50.80	104.10	10637.10	-42.93	189.54	189.54	10.55

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Operator:	Oasis Petroleum North America, LLC	
Well :	Chalmers 5300 21-19 9B	
County:	Mckenzie	State: ND
QQ:	Lot 2	Section: 19
Township:	153	N/S: N
Range:	100	E/W: W
Footages:	2259	FN/SL: N
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Kick-off:	1/9/2015
Finish:	2/26/2015
Directional Supervision:	Ryan Directional Services
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Minimum Curvature Method (SPE-3362)

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

No.	MD	INC	TRUE				SECT	DLS/ 100
			AZM	TVD	N-S	E-W		
105	10726.00	54.60	103.60	10655.88	-48.83	213.48	213.48	12.32
106	10757.00	57.10	104.40	10673.28	-55.03	238.37	238.37	8.34
107	10788.00	61.70	104.10	10689.06	-61.60	264.22	264.22	14.86
108	10819.00	66.20	103.00	10702.67	-68.12	291.29	291.29	14.86
109	10850.00	69.30	102.60	10714.41	-74.47	319.27	319.27	10.07
110	10882.00	70.30	103.10	10725.46	-81.15	348.55	348.55	3.45
111	10913.00	75.70	102.20	10734.52	-87.64	377.46	377.46	17.64
112	10944.00	79.20	102.50	10741.25	-94.11	407.02	407.02	11.33
113	10975.00	79.40	102.10	10747.01	-100.60	436.78	436.78	1.42
114	11006.00	82.20	101.20	10751.96	-106.78	466.75	466.75	9.48
115	11037.00	86.40	103.10	10755.04	-113.27	496.89	496.89	14.86
116	11068.00	88.10	104.50	10756.53	-120.65	526.96	526.96	7.10
117	11094.00	88.60	103.10	10757.28	-126.85	552.20	552.20	5.72
118	11126.00	89.00	103.70	10757.95	-134.27	583.32	583.32	2.25
119	11158.00	89.70	103.10	10758.31	-141.68	614.45	614.45	2.88
120	11190.00	89.60	102.90	10758.51	-148.88	645.63	645.63	0.70
121	11220.00	89.90	103.30	10758.64	-155.68	674.85	674.85	1.67
122	11252.00	89.90	103.80	10758.69	-163.18	705.96	705.96	1.56
123	11282.00	90.20	103.70	10758.67	-170.31	735.10	735.10	1.05
124	11312.00	90.20	101.80	10758.56	-176.93	764.35	764.35	6.33
125	11344.00	90.70	101.20	10758.31	-183.31	795.71	795.71	2.44
126	11375.00	90.70	100.80	10757.93	-189.22	826.14	826.14	1.29
127	11405.00	89.90	98.40	10757.77	-194.23	855.72	855.72	8.43
128	11437.00	89.70	97.60	10757.89	-198.68	887.40	887.40	2.58
129	11468.00	89.60	97.00	10758.08	-202.62	918.15	918.15	1.96
130	11500.00	89.30	94.60	10758.38	-205.85	949.98	949.98	7.56
131	11531.00	89.10	92.80	10758.82	-207.85	980.92	980.92	5.84
132	11563.00	88.20	90.70	10759.57	-208.83	1012.89	1012.89	7.14
133	11595.00	88.10	90.40	10760.60	-209.14	1044.87	1044.87	0.99
134	11688.00	87.30	88.10	10764.33	-207.92	1137.78	1137.78	2.62
135	11781.00	90.00	89.30	10766.53	-205.81	1230.72	1230.72	3.18
136	11874.00	91.50	89.00	10765.31	-204.43	1323.70	1323.70	1.64
137	11966.00	89.90	88.40	10764.18	-202.35	1415.67	1415.67	1.86
138	12061.00	88.70	86.70	10765.35	-198.29	1510.57	1510.57	2.19
139	12156.00	89.20	87.00	10767.09	-193.07	1605.41	1605.41	0.61

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Operator:	Oasis Petroleum North America, LLC	
Well :	Chalmers 5300 21-19 9B	
County:	Mckenzie	State: ND
QQ:	Lot 2	Section: 19
Township:	153	N/S: N
Range:	100	E/W: W
Footages:	2259	FN/SL: N
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Kick-off:	1/9/2015
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Minimum Curvature Method (SPE-3362)

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

No.	MD	INC	TRUE				SECT	DLS/ 100
			AZM	TVD	N-S	E-W		
140	12251.00	90.90	87.30	10767.00	-188.34	1700.29	1700.29	1.82
141	12345.00	90.50	88.00	10765.85	-184.49	1794.20	1794.20	0.86
142	12440.00	87.70	86.60	10767.35	-180.02	1889.07	1889.07	3.30
143	12535.00	88.30	87.90	10770.66	-175.46	1983.90	1983.90	1.51
144	12630.00	89.30	87.50	10772.65	-171.65	2078.80	2078.80	1.13
145	12724.00	89.10	88.10	10773.96	-168.04	2172.72	2172.72	0.67
146	12819.00	88.00	87.70	10776.37	-164.56	2267.63	2267.63	1.23
147	12914.00	87.60	88.80	10780.02	-161.66	2362.51	2362.51	1.23
148	13009.00	89.90	90.40	10782.09	-161.00	2457.48	2457.48	2.95
149	13103.00	91.70	91.50	10780.78	-162.56	2551.45	2551.45	2.24
150	13198.00	91.10	90.10	10778.45	-163.88	2646.41	2646.41	1.60
151	13293.00	89.10	91.30	10778.29	-165.04	2741.40	2741.40	2.46
152	13388.00	89.70	91.50	10779.28	-167.36	2836.36	2836.36	0.67
153	13482.00	87.40	90.70	10781.66	-169.17	2930.31	2930.31	2.59
154	13577.00	87.60	90.80	10785.81	-170.41	3025.21	3025.21	0.24
155	13672.00	88.50	90.80	10789.04	-171.74	3120.14	3120.14	0.95
156	13767.00	89.90	90.10	10790.36	-172.48	3215.13	3215.13	1.65
157	13861.00	90.10	90.80	10790.36	-173.22	3309.12	3309.12	0.77
158	13956.00	89.20	91.40	10790.94	-175.04	3404.10	3404.10	1.14
159	14051.00	90.30	92.80	10791.36	-178.53	3499.04	3499.04	1.87
160	14146.00	90.70	91.90	10790.53	-182.42	3593.95	3593.95	1.04
161	14241.00	89.70	89.10	10790.20	-183.25	3688.94	3688.94	3.13
162	14335.00	89.50	87.60	10790.85	-180.54	3782.89	3782.89	1.61
163	14430.00	89.80	88.20	10791.44	-177.06	3877.83	3877.83	0.71
164	14525.00	90.40	87.30	10791.27	-173.33	3972.75	3972.75	1.14
165	14620.00	89.10	87.70	10791.68	-169.19	4067.66	4067.66	1.43
166	14714.00	89.10	87.10	10793.16	-164.93	4161.55	4161.55	0.64
167	14810.00	88.20	86.40	10795.42	-159.48	4257.37	4257.37	1.19
168	14905.00	90.30	88.50	10796.67	-155.26	4352.25	4352.25	3.13
169	15000.00	89.20	88.90	10797.08	-153.10	4447.23	4447.23	1.23
170	15094.00	88.10	88.50	10799.29	-150.97	4541.17	4541.17	1.25
171	15189.00	88.70	89.00	10801.95	-148.90	4636.11	4636.11	0.82
172	15284.00	89.70	89.20	10803.27	-147.41	4731.09	4731.09	1.07
173	15379.00	89.70	90.00	10803.77	-146.75	4826.09	4826.09	0.84
174	15474.00	89.00	90.70	10804.85	-147.33	4921.08	4921.08	1.04

SUNBURST CONSULTING, INC.

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Operator:	Oasis Petroleum North America, LLC	
Well :	Chalmers 5300 21-19 9B	
County:	Mckenzie	State: ND
QQ:	Lot 2	Section: 19
Township:	153	N/S: N
Range:	100	E/W: W
Footages:	2259	FN/SL: N
	327	FE/WL: W

Kick-off:	1/9/2015
Finish:	2/26/2015
Directional Supervision:	Ryan Directional Services
Date:	3/5/2015
Time:	9:05
F9 to re-calculate	
Proposed dir:	90

Minimum Curvature Method (SPE-3362)

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

No.	MD	INC	TRUE				SECT	DLS/ 100
			AZM	TVD	N-S	E-W		
175	15568.00	87.80	91.70	10807.47	-149.29	5015.02	5015.02	1.66
176	15663.00	87.30	92.00	10811.53	-152.36	5109.88	5109.88	0.61
177	15758.00	87.10	91.70	10816.18	-155.42	5204.72	5204.72	0.38
178	15853.00	89.00	90.60	10819.41	-157.32	5299.64	5299.64	2.31
179	15948.00	88.40	90.70	10821.56	-158.40	5394.61	5394.61	0.64
180	16043.00	90.10	91.00	10822.81	-159.81	5489.58	5489.58	1.82
181	16137.00	90.00	90.80	10822.72	-161.29	5583.57	5583.57	0.24
182	16232.00	91.10	90.80	10821.81	-162.61	5678.56	5678.56	1.16
183	16327.00	91.30	90.60	10819.82	-163.77	5773.53	5773.53	0.30
184	16422.00	91.20	90.50	10817.75	-164.69	5868.50	5868.50	0.15
185	16516.00	90.30	90.10	10816.52	-165.18	5962.49	5962.49	1.05
186	16611.00	90.00	90.00	10816.27	-165.26	6057.49	6057.49	0.33
187	16706.00	89.90	90.00	10816.35	-165.26	6152.49	6152.49	0.11
188	16800.00	89.90	90.10	10816.52	-165.34	6246.49	6246.49	0.11
189	16895.00	89.70	90.20	10816.85	-165.59	6341.49	6341.49	0.24
190	16990.00	88.70	89.90	10818.18	-165.68	6436.48	6436.48	1.10
191	17085.00	89.50	91.00	10819.67	-166.42	6531.46	6531.46	1.43
192	17180.00	91.30	91.60	10819.01	-168.58	6626.43	6626.43	2.00
193	17274.00	91.10	91.60	10817.04	-171.20	6720.37	6720.37	0.21
194	17369.00	87.80	89.80	10817.95	-172.36	6815.35	6815.35	3.96
195	17464.00	87.60	89.50	10821.76	-171.78	6910.27	6910.27	0.38
196	17559.00	87.90	89.50	10825.49	-170.95	7005.19	7005.19	0.32
197	17654.00	89.00	88.80	10828.06	-169.54	7100.14	7100.14	1.37
198	17748.00	90.50	89.00	10828.47	-167.74	7194.12	7194.12	1.61
199	17843.00	90.50	89.50	10827.64	-166.50	7289.11	7289.11	0.53
200	17938.00	90.10	89.30	10827.14	-165.50	7384.10	7384.10	0.47
201	18033.00	88.70	88.50	10828.14	-163.68	7479.08	7479.08	1.70
202	18127.00	89.70	89.20	10829.45	-161.79	7573.05	7573.05	1.30
203	18222.00	88.90	88.70	10830.61	-160.05	7668.02	7668.02	0.99
204	18317.00	89.60	89.80	10831.86	-158.81	7763.01	7763.01	1.37
205	18412.00	90.30	90.80	10831.94	-159.30	7858.00	7858.00	1.28
206	18506.00	90.00	90.80	10831.69	-160.62	7951.99	7951.99	0.32
207	18601.00	89.20	90.00	10832.36	-161.28	8046.99	8046.99	1.19
208	18696.00	89.30	90.50	10833.60	-161.70	8141.98	8141.98	0.54
209	18791.00	88.70	90.30	10835.26	-162.36	8236.96	8236.96	0.67

SUNBURST CONSULTING, INC.

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Operator:	Oasis Petroleum North America, LLC	
Well :	Chalmers 5300 21-19 9B	
County:	Mckenzie	State: ND
QQ:	Lot 2	Section: 19
Township:	153	N/S: N
Range:	100	E/W: W
Footages:	2259	FN/SL: N
	327	FE/WL: W

Kick-off:	1/9/2015
Finish:	2/26/2015
Directional Supervision:	
Ryan Directional Services	

Date: 3/5/2015
 Time: 9:05
F9 to re-calculate

Proposed dir: 90

Minimum Curvature Method (SPE-3362)

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

No.	MD	INC	TRUE				SECT	DLS/ 100
			AZM	TVD	N-S	E-W		
210	18886.00	90.00	90.80	10836.34	-163.27	8331.95	8331.95	1.47
211	18980.00	89.60	90.80	10836.66	-164.58	8425.94	8425.94	0.43
212	19075.00	91.30	90.80	10835.92	-165.91	8520.92	8520.92	1.79
213	19170.00	91.00	90.20	10834.01	-166.74	8615.90	8615.90	0.71
214	19265.00	89.90	88.80	10833.26	-165.91	8710.89	8710.89	1.87
215	19360.00	90.50	89.60	10832.93	-164.58	8805.88	8805.88	1.05
216	19454.00	90.30	89.50	10832.28	-163.84	8899.87	8899.87	0.24
217	19549.00	90.30	89.30	10831.78	-162.85	8994.87	8994.87	0.21
218	19644.00	90.70	88.90	10830.95	-161.36	9089.85	9089.85	0.60
219	19739.00	91.10	89.50	10829.46	-160.03	9184.83	9184.83	0.76
220	19833.00	91.10	90.30	10827.65	-159.87	9278.81	9278.81	0.85
221	19928.00	90.40	90.00	10826.41	-160.12	9373.80	9373.80	0.80
222	20023.00	90.80	90.00	10825.41	-160.12	9468.80	9468.80	0.42
223	20118.00	90.60	90.00	10824.25	-160.12	9563.79	9563.79	0.21
224	20212.00	90.10	89.40	10823.68	-159.62	9657.78	9657.78	0.83
225	20307.00	90.00	89.10	10823.60	-158.38	9752.78	9752.78	0.33
226	20372.00	89.30	88.90	10823.99	-157.25	9817.76	9817.76	1.12
227	20440.00	89.30	88.90	10824.83	-155.94	9885.75	9885.75	0.00

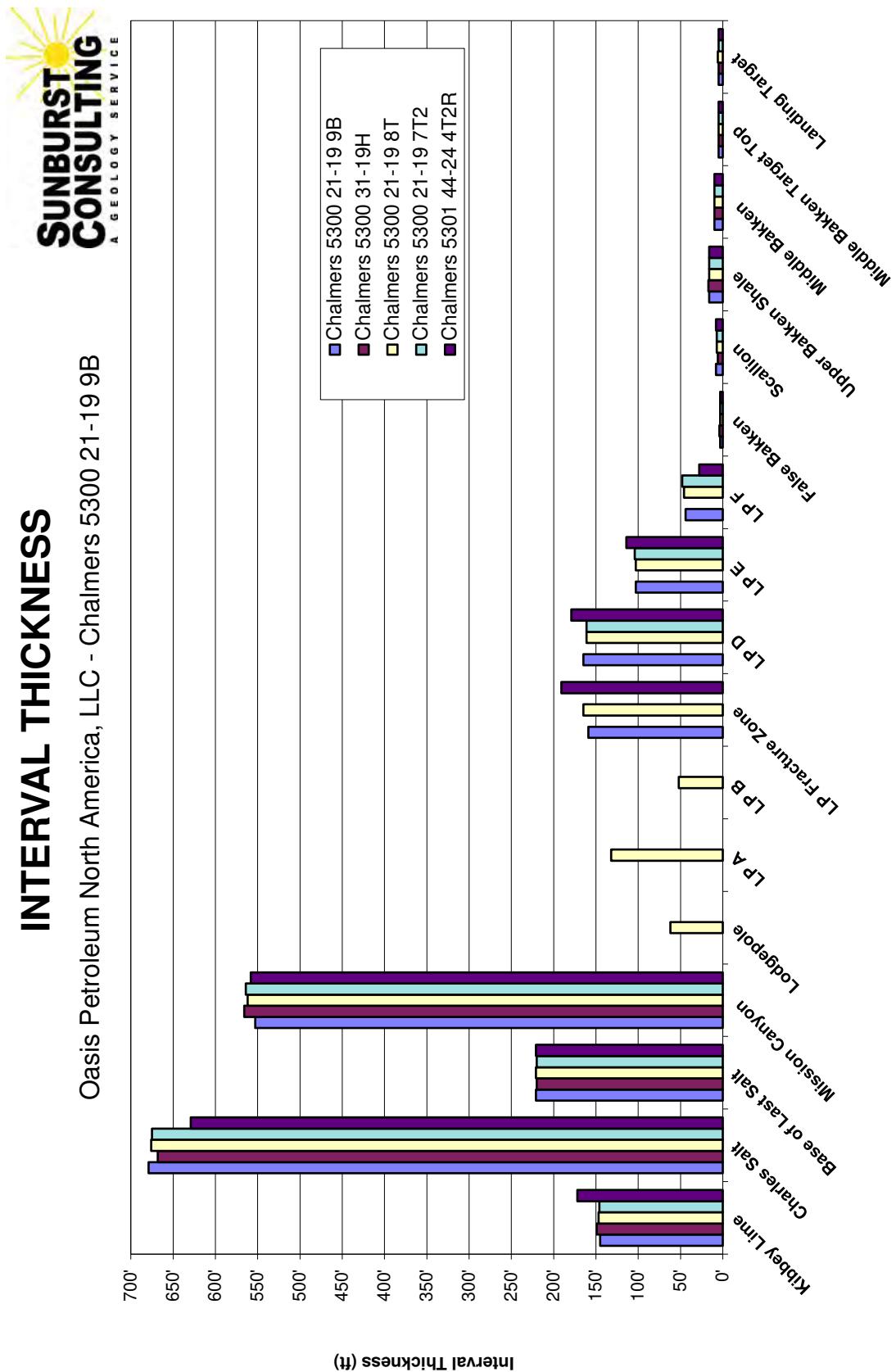
FORMATION TOPS & STRUCTURAL RELATIONSHIPS

CONTROL DATA

Operator:	Oasis Petroleum North America, LLC			Oasis Petroleum North America, LLC			Oasis Petroleum North America, LLC
Well Name:	Chalmers 5300 21-19 8T			Chalmers 5300 21-19 7T2			Chalmers 5301 44-24 41TR
Location:	NW SW Sec. 19 T153N R100W McKenzie County, ND ~1/4 mile S of subject well			Lot 2, Sec. 19, T153N, R101W McKenzie County, ND Shares paid with subject well			SE SE Sec. 24 T153N R101W McKenzie County, ND ~1/2 mile SW of subject well
Elevation:	KB: 1,929'			KB: 2,076'			KB: 1,968'
Formation/ Zone	E-Log Top	Datum (MSL)	Interval Thickness	Thickness to Target Landing	TVD Top	Datum (MSL)	Interval Thickness
Kirbey Lime	8,243'	-6,314'	149'	2,355'	8,386'	-6,310'	147'
Charles Salt	8,392'	-6,463'	668'	2,206'	8,533'	-6,457'	676'
Base of Last Salt	9,060'	-7,131'	220'	1,558'	9,209'	-7,133'	221'
Mission Canyon	9,280'	-7,351'	566'	1,318'	9,430'	-7,354'	562'
Lodgepole	9,846'	-7,917'	-	752'	9,992'	-7,916'	62'
LP A	-	-	-	-	10,054'	-7,978'	132'
LP B	-	-	-	-	10,186'	-8,110'	52'
LP Fracture Zone							
LP D	-	-	-	-	10,238'	-8,162'	165'
LP E	-	-	-	-	10,403'	-8,327'	161'
LP F	-	-	-	-	10,564'	-8,488'	103'
False Bakken	10,556'	-8,627'	4'	42'	10,713'	-8,637'	3'
Scallion	10,560'	-8,631'	6'	38'	10,716'	-8,640'	7'
Upper Bakken Shale	10,566'	-8,637'	17'	32'	10,723'	-8,647'	16'
Middle Bakken	10,583'	-8,654'	10'	15'	10,739'	-8,663'	10'
Middle Bakken Target Top	10,593'	-8,664'	5'	5'	10,749'	-8,673'	5'
Landing Target	10,598'	-8,669'	5'	0	10,754'	-8,678'	6'
Middle Bakken Target Base	10,603'	-8,674'	13'	-5'	10,760'	-8,684'	12'
Lower Bakken Shale	10,616'	-8,687'	33'	-18'	10,772'	-8,696'	41'
Three Forks	10,649'	-8,720'	-	-51'	10,813'	-8,737'	-
					-59'	10,810	-8,734'
					-55'	10,667'	-8,699'

INTERVAL THICKNESS

Oasis Petroleum North America, LLC - Chalmers 5300 21-19 9B



LANDING PROJECTION

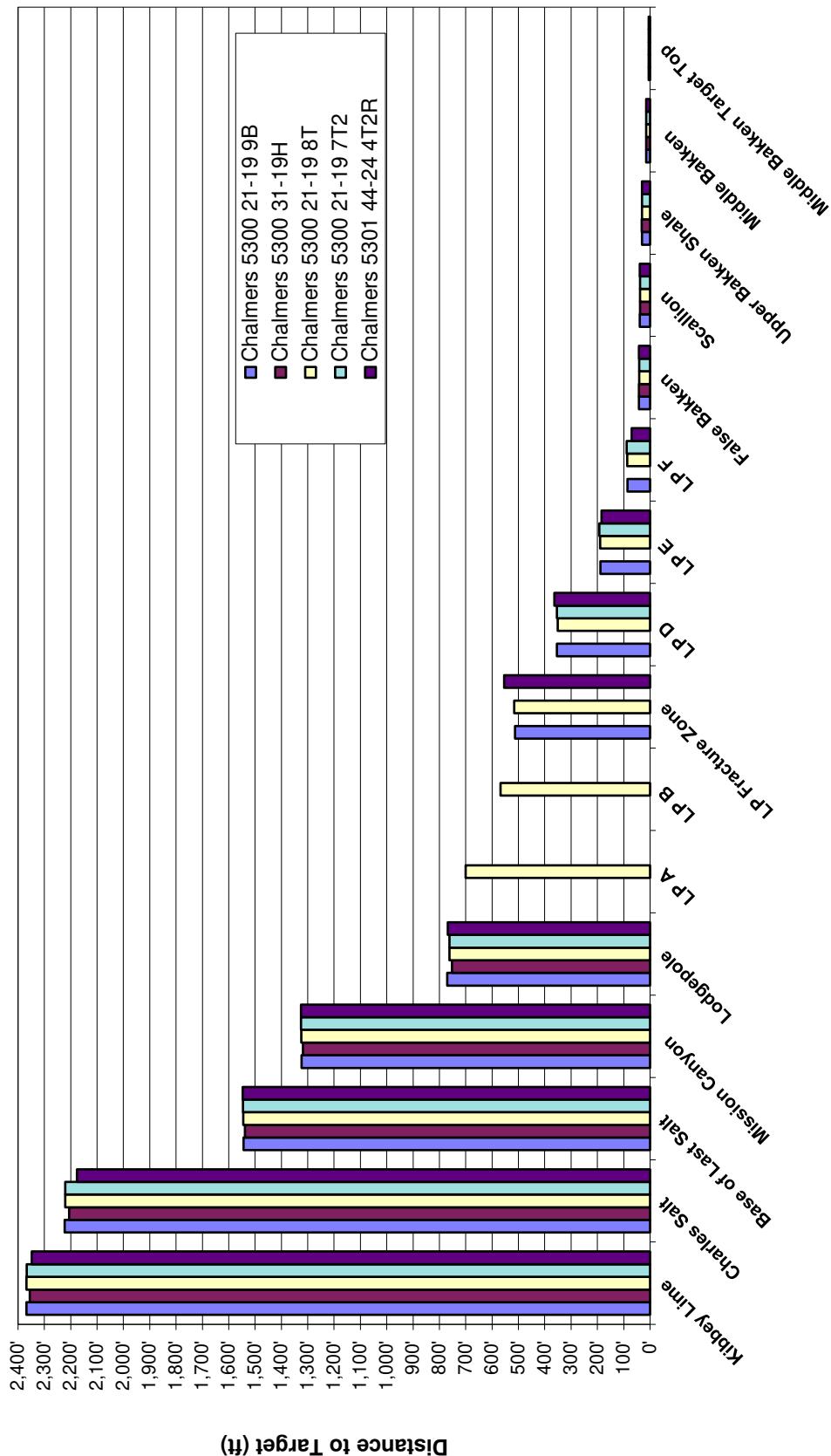
Formation/Zone:	Proposed Target Landing From:				
	Chalmers 5300 31-19H	Chalmers 5300 21-19 8T	Chalmers 5300 21-19 7T2	Chalmers 5300 44-24 4T2R	Average of Offset Wells
Kibbey Lime	10,745'	10,758'	10,757'	10,738'	10,750
Charles Salt	10,741'	10,756'	10,756'	10,711'	10,741'
Base of Last Salt	10,752'	10,759'	10,760'	10,761'	10,758'
Mission Canyon	10,753'	10,759'	10,761'	10,761'	10,759
Lodgepole	10,740'	10,750'	10,750'	10,756'	10,749'
LP A	-	-	-	-	-
LP B	-	-	-	-	-
LP Fracture Zone	-	10,761'	-	10,799'	10,780'
LP D	-	10,755'	10,758'	10,767'	10,760'
LP E	-	10,759'	10,762'	10,753'	10,758
LP F	-	10,759'	10,761'	10,742'	10,754'
False Bakken	10,758'	10,757'	10,757'	10,758'	10,758
Scallion	10,757'	10,757'	10,757'	10,758'	10,757'
Upper Bakken Shale	10,759'	10,758'	10,758'	10,758'	10,758'
Middle Bakken	10,758'	10,758'	10,758'	10,758'	10,758
Middle Bakken Target Top	10,758'	10,758'	10,758'	10,758'	10,758
Landing Target	10,758'	10,758'	10,758'	10,758'	10,758'

Current Landing Target (5' below target top): 10,758'

Landing targets are subject to change as new formation tops are available

ISOPACH TO TARGET

Oasis Petroleum North America, LLC - Chalmers 5300 21-19 9B



LITHOLOGY

**Oasis Petroleum North America, LLC
Chalmers 5300 21-19 11B**

Rig crews caught 30' sample intervals, under the supervision of Sunburst geologists, from 8,240' to the TD of the lateral at 20,440'. Formation tops and lithologic markers have been inserted into the sample descriptions below for reference. Sample descriptions begin in the Kibbey Formation just prior to the Kibbey Lime. Samples were examined wet and dry under a binocular microscope. Sample fluorescent cuts are masked by invert mud through intermediate casing. Quantifiers in order of increasing abundance are trace, rare, occasional, common and abundant.

Vertical Log Descriptions: **MD / TVD (MSL Datum)**

Drilling in the Kibbey Formation [Mississippian Big Snowy Group]

8,240-8,270 SILTSTONE: brick orange-red brown, soft, sub blocky, calcareous cement, poorly cemented, no visible porosity, no visible oil stain; rare ANHYDRITE: milky pink, crystalline, soft, massive, earthy

8,270-8,300 SILTSTONE: brick orange-red brown, soft, platy, calcareous cement, poorly cemented, no visible porosity, no visible oil stain; trace SILTY SANDSTONE: tan-off white, very fine grained, sub rounded, moderately sorted, calcite cement, poorly cemented

8,300-8,330 SILTSTONE: brick orange-red brown, soft, platy, calcareous cement, poorly cemented, no visible porosity, no visible oil stain; trace SILTY SANDSTONE: tan-off white, very fine grained, sub rounded, moderately sorted, calcite cement, poorly cemented

8,330-8,360 SILTSTONE: brick orange-red brown, soft, platy, calcareous cement, poorly cemented, no visible porosity, no visible oil stain; trace SILTY SANDSTONE: tan-off white, very fine grained, sub rounded, moderately sorted, calcite cement, poorly cemented

8,360-8,390 SILTSTONE: brick orange-red brown, soft, platy, calcareous cement, poorly cemented, no visible porosity, no visible oil stain; trace SILTY SANDSTONE: tan-off white, very fine grained, sub rounded, moderately sorted, calcite cement, poorly cemented; ANHYDRITE: off white, light gray, soft, amorphous texture

Kibbey Lime **8,390' MD / 8,390 TVD (-6,314')**

8,390-8,420 LIMESTONE: mudstone, light brown, light gray-gray brown, micro crystalline, firm-hard, argillaceous in part, dense, crystalline-chalky texture, no visible porosity; rare ANHYDRITE: off white, light gray, soft, amorphous texture; trace SILTSTONE: dark orange-light brown, tan, pink, soft, sub blocky, calcite cement, poorly cemented

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

8,450-8,480 SILTSTONE: dark orange-light brown, tan, pink, soft, sub blocky, calcite cement, poorly cemented; trace SILTY SANDSTONE: tan-off white, very fine grained, sub rounded, moderately sorted, calcite cement, poorly cemented

8,480-8,510 SILTSTONE: dark orange-light brown, tan, soft, sub blocky, calcite cement, poorly cemented; trace SILTY SANDSTONE: tan-off white, very fine grained, sub rounded, moderately sorted, calcite cement, poorly cemented

Charles Formation [Mississippian Madison Group]

8,535' MD / 8,535' TVD (-6,459')

8,510-8,540 SALT: clear-translucent, frosted, crystalline, firm, euhedral; trace LIMESTONE: mudstone, off white, gray, rare tan, fine crystalline, firm, laminated, crystalline-chalky texture, no visible porosity, no visible oil stain; trace SILTSTONE and SILTY SANDSTONE: as above

8,540-8,570 SALT: clear-translucent, frosted, crystalline, firm, euhedral; trace ARGILLACEOUS LIMESTONE: mudstone-wackestone, light-medium brown, tan, rare light-medium gray, rare gray tan, micro crystalline, friable, earthy

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

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

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

8,660-8,690 SALT: clear-translucent, frosted, crystalline, firm, euhedral, crystalline

8,690-8,720 ANHYDRITE: off white, soft, amorphous texture; occasional ARGILLACEOUS LIMESTONE: mudstone-wackestone, light-medium brown, tan, rare light-medium gray, rare gray tan, micro crystalline, friable, earthy

8,720-8,750 ARGILLACEOUS LIMESTONE: mudstone-wackestone, light-medium brown, tan, rare light-medium gray, rare gray tan, micro crystalline, friable, earthy; rare SALT: as above; trace ANHYDRITE: off white, soft, amorphous texture

8,750-8,780 LIMESTONE: mudstone, gray, off white, rare cream-tan, very fine crystalline, firm, laminated, crystalline-chalky texture, possible intercrystalline porosity, no visible oil stain; SALT: as above

8,780-8,810 SALT: as above; occasional LIMESTONE: mudstone, gray, off white, rare cream-tan, very fine crystalline, firm, laminated, crystalline-chalky texture, possible intercrystalline porosity, no visible oil stain

8,810-8,840 LIMESTONE: mudstone-wackestone, tan, cream, light brown, very fine crystalline, firm, laminated, crystalline, rare intercrystalline porosity, occasional even-spotty light-medium brown oil stain; trace DOLOMITE: medium-light brown, micro crystalline, firm, crystalline, occasional intercrystalline porosity, common medium-light brown spotty oil stain; trace: ANHYDRITE: off white, cream, soft, micro crystalline, anhedral, earthy

8,840-8,870 SALT: clear-translucent, frosted, crystalline, firm, euhedral, crystalline; rare DOLOMITE: medium-light brown, micro crystalline, firm, occasional intercrystalline porosity, common medium-light brown spotty oil stain

8,870-8,900 SALT: as above; occasional ANHYDRITE: off white, cream, soft, microcrystalline, anhedral, earthy; rare LIMESTONE: mudstone-wackestone, tan, cream, light brown, very fine crystalline, firm, laminated, crystalline, rare intercrystalline porosity, occasional spotty light-medium brown oil stain

8,900-8,930 LIMESTONE: mudstone, light brown, light gray brown, off white, microcrystalline, friable, laminated, earthy, trace intercrystalline porosity, rare even-spotty light-medium brown oil stain; common DOLOMITE: mudstone, light brown, light gray brown, microcrystalline, friable-firm, laminated, earthy, trace

intercrystalline porosity, occasional even-spotty light-medium brown oil stain; trace ANHYDRITE: off white, cream-light orange, soft, microcrystalline, anhedral, earthy

8,930-8,960 LIMESTONE: mudstone, light brown, light gray brown, off white, microcrystalline, friable, laminated, earthy, trace intercrystalline porosity, rare even-spotty light-medium brown oil stain; common DOLOMITE: mudstone, light brown, light gray brown, microcrystalline, friable-firm, laminated, earthy, trace intercrystalline porosity, occasional even-spotty light-medium brown oil stain; trace ANHYDRITE: off white, cream, soft, microcrystalline, anhedral, earthy

8,960-8,990 LIMESTONE: mudstone, light brown, light gray brown, off white, microcrystalline, friable, laminated, earthy, trace intercrystalline porosity, rare even-spotty light-medium brown oil stain; common DOLOMITE: mudstone, light brown, light gray brown, microcrystalline, friable-firm, laminated, earthy, trace intercrystalline porosity, occasional even-spotty light-medium brown oil stain; trace ANHYDRITE: off white, cream, soft, microcrystalline, anhedral, earthy

8,990-9,020 SALT: clear-translucent, frosted, crystalline, firm, euhedral

9,020-9,050 ANHYDRITE: cream-light orange, soft, microcrystalline, anhedral, earthy; occasional DOLOMITE: mudstone, light brown, light gray brown, microcrystalline, friable-firm, laminated, earthy, trace intercrystalline porosity, occasional spotty light-medium brown oil stain; trace SALT: as above

9,050-9,080 ANHYDRITE: cream, soft, microcrystalline, massive, earthy-amorphous; occasional DOLOMITE: mudstone, light brown, light gray brown, microcrystalline, friable-firm, laminated, earthy, trace intercrystalline porosity, occasional spotty light-medium brown oil stain; rare LIMESTONE: mudstone, light brown, light gray brown, off white, microcrystalline, friable, laminated, earthy, trace intercrystalline porosity, trace spotty light-medium brown oil stain

9,080-9,110 LIMESTONE: mudstone, light brown, light gray brown, off white, microcrystalline, friable, laminated, earthy, trace intercrystalline porosity, rare spotty light brown oil stain; occasional DOLOMITE: mudstone, light brown, light gray brown, microcrystalline, friable-firm, laminated, earthy, trace intercrystalline porosity, occasional spotty light brown oil stain

9,110-9,140 LIMESTONE: mudstone, light brown, light gray brown, off white, microcrystalline, friable, laminated, earthy, trace intercrystalline porosity, rare spotty light brown oil stain; occasional DOLOMITE: mudstone, light brown, light gray brown, microcrystalline, friable-firm, laminated, earthy, trace intercrystalline porosity, occasional spotty light brown oil stain; rare ANHYDRITE: off white, soft, microcrystalline, massive, earthy-amorphous

9,140-9,170 LIMESTONE: mudstone, light brown, light gray brown, off white, microcrystalline, friable, laminated, earthy, trace intercrystalline porosity, rare spotty light brown oil stain; occasional DOLOMITE: mudstone, light brown, light gray brown, microcrystalline, friable-firm, laminated, earthy, trace intercrystalline porosity, occasional spotty light brown oil stain; rare ANHYDRITE: off white, soft, microcrystalline, massive, earthy-amorphous

9,170-9,200 SALT: clear-translucent, frosted, crystalline, firm, euhedral

Base Last Salt /Charles Formation/

9,214' MD / 9,214' TVD (-7,138')

9,200-9,230 ANHYDRITE: off white, cream, soft, microcrystalline, massive, earthy-amorphous; SALT: clear-translucent, frosted, crystalline, firm, euhedral; DOLOMITE: mudstone, light brown, light gray brown, rare light gray, microcrystalline, friable-firm, laminated, earthy, trace intercrystalline porosity, occasional spotty light brown oil stain

9,230-9,260 ANHYDRITE: off white, soft, microcrystalline, massive, earthy-amorphous; occasional DOLOMITE: mudstone, light gray brown, microcrystalline, friable-firm, laminated, earthy, trace intercrystalline porosity, occasional spotty light-medium brown oil stain; rare LIMESTONE: mudstone, light brown, light gray brown, off white, microcrystalline, friable, laminated, earthy, trace intercrystalline porosity, trace spotty light-medium brown oil stain

9,260-9,290 DOLOMITE: mudstone, light brown, light gray, light gray brown, microcrystalline, friable-firm, laminated, earthy trace intercrystalline porosity, occasional spotty light brown oil stain; ANHYDRITE: off white, cream, soft, microcrystalline, massive, earthy-amorphous

9,290-9,320 LIMESTONE: mudstone, light brown-brown, microcrystalline, firm, earthy-crystalline texture, trace intercrystalline porosity, trace spotty light brown oil stain; rare ANHYDRITE: off white, cream, soft, microcrystalline, massive, earthy-amorphous

9,320-9,350 LIMESTONE: mudstone, light gray, light gray brown, rare light brown, firm, earthy-crystalline texture, trace intercrystalline porosity, trace disseminated pyrite, trace spotty light brown oil stain; trace ANHYDRITE: off white, cream, soft, microcrystalline, massive, earthy-amorphous

9,350-9,380 LIMESTONE: mudstone, gray-light gray, gray brown, rare light brown, firm-friable, earthy-crystalline texture, trace intercrystalline porosity, trace disseminated pyrite, no visible oil stain; trace ANHYDRITE: off white, cream, soft, microcrystalline, massive, earthy-amorphous

9,380-9,410 LIMESTONE: mudstone, gray-light gray, gray brown, rare light brown, firm-friable, earthy-crystalline texture, trace intercrystalline porosity, trace disseminated pyrite, no visible oil stain; trace ANHYDRITE: off white, cream, soft, microcrystalline, massive, earthy-amorphous

Mission Canyon Formation [Mississippian Madison Group] 9,435' MD / 9,435' TVD (-7,359')

9,410-9,440 LIMESTONE: mudstone, light brown-off white, light gray brown, trace gray, firm-friable, earthy-crystalline texture, possible intercrystalline porosity, trace disseminated pyrite, argillaceous in part, no visible oil stain; trace ANHYDRITE: off white, cream, soft, microcrystalline, massive, earthy-amorphous

9,440-9,470 LIMESTONE: mudstone, light brown-brown, gray brown, trace gray, firm-friable, earthy-crystalline texture, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; trace ANHYDRITE: off white, cream, soft, microcrystalline, massive, earthy-amorphous

9,470-9,500 LIMESTONE: mudstone, light gray, light brown, gray brown, trace dark gray, firm-friable, earthy, rarely crystalline texture, trace disseminated pyrite, trace fossil fragments, trace spotty light brown oil stain

9,500-9,530 ARGILLACEOUS LIMESTONE: mudstone, light gray, occasional medium gray, rare gray tan, rare off white, trace dark gray, firm-friable, crystalline-chalky texture, trace disseminated pyrite, possible intercrystalline porosity, trace light brown spotty oil stain

9,530-9,560 LIMESTONE: mudstone, light gray, light brown, gray brown, trace dark gray, firm-friable, earthy, rarely crystalline texture, trace disseminated pyrite, trace fossil fragments, trace spotty light brown oil stain

9,560-9,590 LIMESTONE: mudstone, light gray, light brown, gray brown, trace dark gray, firm-friable, earthy, rarely crystalline texture, trace disseminated pyrite, trace fossil fragments, trace spotty light brown oil stain

9,590-9,620 ARGILLACEOUS LIMESTONE: mudstone, light gray, occasional medium gray, rare gray tan, rare off white, trace dark gray, firm-friable, crystalline-chalky texture, trace disseminated pyrite, trace fossil fragments, trace light brown spotty oil stain

9,620-9,650 LIMESTONE: mudstone, light gray, light brown, gray brown, trace dark gray, firm-friable, earthy, rarely crystalline texture, trace disseminated pyrite, trace fossil fragments, trace spotty light brown oil stain

9,650-9,680 LIMESTONE: mudstone, light gray, light brown, gray brown, trace dark gray, firm-friable, earthy, rarely crystalline texture, trace disseminated pyrite, trace fossil fragments, trace spotty light brown oil stain

9,680-9,710 LIMESTONE: mudstone, gray-brown, trace dark gray, firm-friable, earthy, rarely crystalline texture, trace disseminated pyrite, trace fossil fragments, trace spotty light brown oil stain

9,710-9,740 LIMESTONE: mudstone, light gray-brown, trace dark gray, firm-friable, earthy, rarely crystalline texture, trace disseminated pyrite, trace fossil fragments, trace spotty light brown oil stain

9,740-9,770 LIMESTONE: mudstone, light gray-brown, trace dark gray, firm-friable, earthy, rarely crystalline texture, trace disseminated pyrite, trace fossil fragments, trace spotty light brown oil stain

9,770-9,800 LIMESTONE: mudstone, light gray-brown, trace dark gray, firm-friable, earthy, rarely crystalline texture, trace disseminated pyrite, trace fossil fragments, trace spotty light brown oil stain

9,800-9,830 DOLOMITE: tan-light brown gray, off white, microcrystalline, fine crystalline, rare intercrystalline porosity, argillaceous in part, trace light brown spotty oil stain; rare LIMESTONE: mudstone, cream-tan, gray, trace off white, microcrystalline, friable-firm, dense, massive, trace laminated, occasional Algal laminated, earthy, trace calcite, trace pyrite, no visible porosity, trace dead oil stain

9,830-9,860 LIMESTONE: mudstone, light gray-brown, trace dark gray, firm-friable, earthy, rarely crystalline texture, trace disseminated pyrite, trace fossil fragments, trace spotty light brown oil stain

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

9,890-9,920 ARGILLACEOUS LIMESTONE: mudstone, light gray, occasional medium gray, rare gray tan, rare off white, trace dark gray, firm-friable, crystalline-chalky texture, trace disseminated pyrite, no visible porosity, no visible oil stain; LIMESTONE: mudstone, light-gray, rare off white, trace dark gray, trace brown, friable-firm, dense, earthy, possible intercrystalline porosity, trace light brown spotty oil stain

9,920-9,950 LIMESTONE: mudstone, light-gray, rare off white, trace brown, friable-firm, dense, earthy, trace spotty light brown oil stain; occasional ARGILLACEOUS LIMESTONE: mudstone, light gray, occasional medium gray, rare gray tan, rare off white, trace dark gray, firm-friable, crystalline-chalky texture, trace disseminated pyrite, no visible porosity, no visible oil stain

9,950-9,980 LIMESTONE: mudstone, light gray-brown, trace dark gray, firm-friable, earthy, rarely crystalline texture, trace disseminated pyrite, trace fossil fragments

Lodgepole /Mississippian Madison Group/ **9,988' MD / 9,988' TVD (-7,912')**

9,980-10,010 LIMESTONE: mudstone, light gray-brown, trace dark gray, firm-friable, earthy, rarely crystalline texture, trace disseminated pyrite, trace fossil fragments, no visible porosity, no visible oil stain

10,010-10,040 LIMESTONE: mudstone, light gray-brown, trace dark gray, firm-friable, earthy, rarely crystalline texture, trace disseminated pyrite, no visible porosity, no visible oil stain

10,040-10,070 LIMESTONE: mudstone, light gray-gray, gray brown, trace light brown, firm-friable, earthy, rarely crystalline texture, trace disseminated pyrite, no visible porosity, no visible oil stain

10,070-10,100 ARGILLACEOUS LIMESTONE: mudstone, light gray-gray, gray brown, trace light brown, firm-friable, earthy, rarely crystalline texture, trace disseminated pyrite, no visible porosity, no visible oil stain

10,100-10,130 LIMESTONE: mudstone, light gray-gray, gray brown, trace light brown, firm-friable, earthy, rarely crystalline texture, trace disseminated pyrite, no visible porosity, no visible oil stain

10,130-10,160 ARGILLACEOUS LIMESTONE: mudstone, light gray-gray, gray brown, trace light brown, firm-friable, earthy, rarely crystalline texture, trace disseminated pyrite, no visible porosity, no visible oil stain

10,160-10,190 ARGILLACEOUS LIMESTONE: mudstone, light gray-gray, gray brown, trace light brown, firm-friable, earthy, rarely crystalline texture, trace disseminated pyrite, no visible porosity, no visible oil stain

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

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

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

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

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

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

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

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

10,400-10,430 ARGILLACEOUS LIMESTONE: mudstone, light gray-gray, rare gray brown, firm, earthy, rare crystalline texture, occasional disseminated pyrite, no visible porosity, no visible oil stain

10,430-10,460 ARGILLACEOUS LIMESTONE: mudstone, light gray-gray, rare gray brown, firm, earthy, rare crystalline texture, occasional disseminated pyrite, no visible porosity, no visible oil stain

10,460-10,490 ARGILLACEOUS LIMESTONE: mudstone, light gray-gray, rare gray brown, firm, earthy, rare crystalline texture, occasional disseminated pyrite, no visible porosity, no visible oil stain

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

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

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

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

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

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

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

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

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

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

10,790-10,820 ARGILLACEOUS LIMESTONE: mudstone, medium gray, light gray-gray, gray brown, firm-friable, earthy, occasional disseminated pyrite, no visible porosity, no visible oil stain

10,820-10,850 ARGILLACEOUS LIMESTONE: mudstone, medium gray, light gray-gray, gray brown, firm-friable, earthy, occasional disseminated pyrite, no visible porosity, no visible oil stain

False Bakken Member/Lodgepole Formation **10,855' MD / 10,716' TVD (-8,640')**

Scallion /Lodgepole Formation **10,860' MD / 10,719' TVD (-8,643')**

10,850-10,880 LIMESTONE: mudstone, trace wackestone-packstone, tan, light gray brown, rare light gray, very fine crystalline, firm, laminated, crystalline, possible intercrystalline porosity, trace light brown spotty oil stain; occasional SHALE: dark gray, gray black, firm, sub blocky, earthy

Upper Bakken Shale /Mississippian **10,888' MD / 10,727' TVD (-8,651')**

10,880-10,910 SHALE: black, black gray, hard, sub blocky-sub platy, earthy, pyritic, carbonaceous, fracture porosity, black oil stain

10,910-10,940 SHALE: black, black gray, hard, sub blocky-sub platy, earthy, pyritic, carbonaceous, fracture porosity, black oil stain

Middle Bakken Member [Miss.-Devonian]

10,958' MD / 10,743' TVD (-8,667')

10,940-10,970 SILTY SANDSTONE: light gray brown, light gray, rare light brown, very fine grained, firm, sub rounded, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated, nodular pyrite, fair intercrystalline porosity, trace light brown spotty oil stain; rare SHALE: as above

10,970-11,000 SILTY SANDSTONE: light brown-light gray brown, rare light gray, very fine grained, firm, sub rounded, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated, nodular pyrite, fair intercrystalline porosity, trace light brown spotty oil stain

11,000-11,030 SILTY SANDSTONE: light brown-tan, occasional light gray brown, trace light gray, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, intercrystalline porosity, occasional light brown spotty oil stain

11,030-11,060 SILTY SANDSTONE: light brown-tan, occasional light gray brown, trace light gray, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, intercrystalline porosity, occasional light brown spotty oil stain

11,060-11,090 SILTY SANDSTONE: light brown-tan, occasional light gray brown, trace light gray, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, intercrystalline porosity, occasional light brown spotty oil stain

11,090-11,127 SILTY SANDSTONE: light brown-tan, occasional light gray brown, trace light gray, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, intercrystalline porosity, occasional light brown spotty oil stain

11,127-11,150 SILTY SANDSTONE: light brown-tan, occasional light gray brown, trace light gray, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, intercrystalline porosity, occasional light brown spotty oil stain

11,150-11,180 SILTY SANDSTONE: medium brown, occasional light brown, trace tan-cream and light gray brown, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain

11,180-11,210 SILTY SANDSTONE: medium brown, occasional light brown, trace tan-cream and light gray brown, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain

11,210-11,240 SILTY SANDSTONE: medium brown, occasional light brown, trace tan-cream and light gray brown, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain

11,240-11,270 SILTY SANDSTONE: medium brown, occasional light brown, trace tan-cream and light gray brown, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain

11,270-11,300 SILTY SANDSTONE: medium brown, occasional light brown, trace tan-cream and light gray brown, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain

11,300-11,330 SILTY SANDSTONE: medium brown, occasional light brown, trace tan-cream and light gray brown, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain

11,330-11,360 SILTY SANDSTONE: medium brown, occasional light brown, trace tan-cream and light gray brown, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain

11,360-11,390 SILTY SANDSTONE: medium brown, occasional light brown, trace tan-cream and light gray brown, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain

11,390-11,420 SILTY SANDSTONE: medium brown, occasional light brown, trace tan-cream and light gray brown, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain; moderately yellow streaming cut fluorescence

11,420-11,450 SILTY SANDSTONE: medium brown, occasional light brown, trace tan-cream and light gray brown, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescence

11,450-11,480 SILTY SANDSTONE: medium brown, occasional light brown, trace tan-cream and light gray brown, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescence

11,480-11,510 SILTY SANDSTONE: medium brown, occasional light brown, trace tan-cream and light gray brown, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescence

11,510-11,540 SILTY SANDSTONE: medium brown, occasional light brown, trace tan-cream and light gray brown, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement,

moderately cement, trace disseminated pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain; moderately yellow streaming cut fluorescence

11,540-11,570 SILTY SANDSTONE: light-medium brown, trace tan-cream and light gray brown, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain; moderately yellow streaming cut fluorescence

11,570-11,600 SILTY SANDSTONE: light-medium brown, trace tan-cream and light gray brown, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain; moderately yellow streaming cut fluorescence

11,600-11,630 SILTY SANDSTONE: light-medium brown, trace tan-cream and light gray brown, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain; moderately yellow streaming cut fluorescence

11,630-11,660 SILTY SANDSTONE: light-medium brown, trace tan-cream and light gray brown, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain; moderately yellow streaming cut fluorescence

11,660-11,690 SILTY SANDSTONE: light-medium brown, trace tan-cream and light gray brown, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain; moderately yellow streaming cut fluorescence

11,690-11,720 SILTY SANDSTONE: light-medium brown, trace tan-cream and light gray brown, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain; moderately yellow streaming cut fluorescence

11,720-11,750 SILTY SANDSTONE: light-medium brown, trace tan-cream and light gray brown, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain; moderately yellow streaming cut fluorescence

11,750-11,780 SILTY SANDSTONE: light-medium brown, trace tan-cream and light gray brown, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain; moderately yellow streaming cut fluorescence

11,780-11,810 SILTY SANDSTONE: light-medium brown, trace tan-cream and light gray brown, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain; moderately yellow streaming cut fluorescence

11,810-11,840 SILTY SANDSTONE: light-medium brown, trace tan-cream and light gray brown, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain; moderately yellow streaming cut fluorescence

11,840-11,870 SILTY SANDSTONE: medium brown, occasional light brown, trace tan-cream and light gray brown, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain

118,970-11,900 SILTY SANDSTONE: medium brown, occasional light brown, trace tan-cream and light gray brown, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain

11,900-11,930 SILTY SANDSTONE: medium brown, occasional light brown, trace tan-cream and light gray brown, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain

11,930-11,960 SILTY SANDSTONE: medium brown, occasional light brown, trace tan-cream and light gray brown, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain

11,960-11,990 SILTY SANDSTONE: medium brown, occasional light brown, trace tan-cream and light gray brown, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain

11,990-12,020 SILTY SANDSTONE: medium brown, occasional light brown, trace tan-cream and light gray brown, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain

12,020-12,050 SILTY SANDSTONE: medium brown, occasional light brown, trace tan-cream and light gray brown, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain

12,050-12,080 SILTY SANDSTONE: medium brown, occasional light brown, trace tan-cream and light gray brown, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain

12,080-12,110 SILTY SANDSTONE: medium brown, occasional light brown, trace tan-cream and light gray brown, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain

12,110-12,140 SILTY SANDSTONE: medium brown, occasional light brown, trace tan-cream and light gray brown, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain

12,140-12,170 SILTY SANDSTONE: medium brown, occasional light brown, trace tan-cream and light gray brown, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain

12,170-12,200 SILTY SANDSTONE: medium brown, occasional light brown, trace tan-cream and light gray brown, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain

12,200-12,230 SILTY SANDSTONE: medium brown, occasional light brown, trace tan-cream and light gray brown, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain

12,230-12,260 SILTY SANDSTONE: medium brown, occasional light brown, trace tan-cream and light gray brown, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain

12,260-12,290 SILTY SANDSTONE: medium brown, occasional light brown, trace tan-cream and light gray brown, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain

12,290-12,320 SILTY SANDSTONE: medium brown, occasional light brown, trace tan-cream and light gray brown, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain

12,320-12,350 SILTY SANDSTONE: medium brown, occasional light brown, trace tan-cream and light gray brown, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain

12,350-12,380 SILTY SANDSTONE: light-medium brown, trace tan-cream and light gray brown, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain

12,380-12,410 SILTY SANDSTONE: light-medium brown, trace tan-cream and light gray brown, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain

12,410-12,440 SILTY SANDSTONE: light-medium brown, trace tan-cream and light gray brown, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain

12,440-12,470 SILTY SANDSTONE: light-medium brown, trace tan-cream and light gray brown, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain

12,470-12,500 SILTY SANDSTONE: light-medium brown, trace tan-cream and light gray brown, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain

12,500-12,530 SILTY SANDSTONE: light-medium brown, trace tan-cream and light gray brown, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain

12,530-12,560 SILTY SANDSTONE: light-medium brown, trace tan-cream and light gray brown, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain

12,560-12,590 SILTY SANDSTONE: light-medium brown, trace tan-cream and light gray brown, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain

12,590-12,620 SILTY SANDSTONE: medium-dark brown, trace tan-cream and light gray brown, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain

12,620-12,650 SILTY SANDSTONE: medium-dark brown, trace tan-cream and light gray brown, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain

12,650-12,680 SILTY SANDSTONE: medium-dark brown, trace tan-cream and light gray brown, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain

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

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

12,740-12,770 SILTY SANDSTONE: medium-dark brown, occasional and light gray brown, rare tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately

cement, trace disseminated pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain

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

12,800-12,830 SILTY SANDSTONE: medium-dark brown, occasional and light gray brown, rare tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain

12,830-12,860 SILTY SANDSTONE: medium-dark brown, occasional and light gray brown, rare tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain

12,860-12,890 SILTY SANDSTONE: medium-dark brown, occasional and light gray brown, rare tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain

12,890-12,920 SILTY SANDSTONE: medium-dark brown, occasional and light gray brown, rare tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain

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

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

12,980-13,010 SILTY SANDSTONE: medium brown, occasional and light gray brown, rare tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain

13,010-13,040 SILTY SANDSTONE: medium brown, occasional and light gray brown, rare tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain

13,040-13,070 SILTY SANDSTONE: medium brown, occasional and light gray brown, rare tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain

13,070-13,100 SILTY SANDSTONE: medium brown, occasional and light gray brown, rare tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain

13,100-13,130 SILTY SANDSTONE: medium brown, occasional and light gray brown, rare tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain

13,130-13,160 SILTY SANDSTONE: medium brown, rare light gray brown, trace tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain

13,160-13,190 SILTY SANDSTONE: medium brown, rare light gray brown, trace tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain

13,190-13,220 SILTY SANDSTONE: medium brown, rare light gray brown, trace tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain

13,220-13,250 SILTY SANDSTONE: medium gray brown, rare light gray brown, rare tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain

13,250-13,280 SILTY SANDSTONE: medium gray brown, rare light gray brown, rare tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain

13,280-13,310 SILTY SANDSTONE: medium gray brown, rare light gray brown, rare tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain

13,310-13,340 SILTY SANDSTONE: medium gray brown, rare light gray brown, rare tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain

13,340-13,370 SILTY SANDSTONE: medium gray brown, rare light gray brown, rare tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain

13,370-13,400 SILTY SANDSTONE: medium gray brown, rare light gray brown, rare tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain

13,400-13,430 SILTY SANDSTONE: medium gray brown, rare light gray brown, rare tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain

13,790-13,820 SILTY SANDSTONE: medium gray brown, rare light gray brown, rare tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain

13,820-13,850 SILTY SANDSTONE: light-medium gray brown, common light-medium brown, rare tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, rare disseminated pyrite, trace nodular pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescence

13,850-13,880 SILTY SANDSTONE: light-medium gray brown, common light-medium brown, rare tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, rare disseminated pyrite, trace nodular pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescence

13,880-13,910 SILTY SANDSTONE: light-medium gray brown, common light-medium brown, rare tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, rare disseminated pyrite, trace nodular pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescence

13,910-13,940 SILTY SANDSTONE: light-medium gray brown, common light-medium brown, rare tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, rare disseminated pyrite, trace nodular pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescence

13,940-13,970 SILTY SANDSTONE: light-medium gray brown, common light-medium brown, rare tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, rare disseminated pyrite, trace nodular pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescence

13,970-14,000 SILTY SANDSTONE: light-medium gray brown, common light-medium brown, rare tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, rare disseminated pyrite, trace nodular pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescence

14,000-14,030 SILTY SANDSTONE: medium brown, common light-medium gray brown, rare tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, rare disseminated pyrite, trace nodular pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescence

14,030-14,060 SILTY SANDSTONE: medium brown, common light-medium gray brown, rare tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, rare disseminated pyrite, trace nodular pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescence

14,060-14,090 SILTY SANDSTONE: medium brown, common light-medium gray brown, rare tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, rare disseminated pyrite, trace nodular pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescence

14,090-14,120 SILTY SANDSTONE: medium brown, common light-medium gray brown, rare tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, rare disseminated pyrite, trace nodular pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescence

14,120-14,150 SILTY SANDSTONE: medium brown, common light-medium gray brown, rare tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, rare disseminated pyrite, trace nodular pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescence

14,150-14,180 SILTY SANDSTONE: medium brown, common light-medium gray brown, rare tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cemented, rare disseminated pyrite, trace nodular pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescence

14,180-14,210 SILTY SANDSTONE: medium brown, common light-medium gray brown, rare tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cemented, rare disseminated pyrite, trace nodular pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescence

14,210-14,240 SILTY SANDSTONE: medium brown, common light-medium gray brown, rare tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, rare disseminated pyrite, trace nodular pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescence

14,240-14,270 SILTY SANDSTONE: medium brown, common light-medium gray brown, rare tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, rare disseminated pyrite, trace nodular pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescence

14,270-14,300 SILTY SANDSTONE: medium brown, common light-medium gray brown, rare tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, rare disseminated pyrite, trace nodular pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescence

14,300-14,330 SILTY SANDSTONE: medium brown, common light-medium gray brown, rare tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, rare disseminated pyrite, trace nodular pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescence

14,330-14,360 SILTY SANDSTONE: medium brown, common light-medium gray brown, rare tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cemented, rare disseminated pyrite, trace nodular pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescence

14,360-14,390 SILTY SANDSTONE: medium brown, common light-medium gray brown, rare tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, rare disseminated pyrite, trace nodular pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescence

14,390-14,420 SILTY SANDSTONE: medium brown, common light-medium gray brown, rare tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, rare disseminated pyrite, trace nodular pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescence

14,420-14,450 SILTY SANDSTONE: medium brown, common light-medium gray brown, rare tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, rare disseminated pyrite, trace nodular pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescence

14,450-14,580 SILTY SANDSTONE: medium gray brown-medium brown, common light brown, rare light gray, trace tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain, fast yellow streaming cut fluorescence

14,480-14,510 SILTY SANDSTONE: medium gray brown-medium brown, common light brown, rare light gray, trace tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain, fast yellow streaming cut fluorescence

14,510-14,540 SILTY SANDSTONE: medium gray brown-medium brown, common light brown, rare light gray, trace tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain, fast yellow streaming cut fluorescence

14,540-14,570 SILTY SANDSTONE: medium gray brown-medium brown, common light brown, rare light gray, trace tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain, fast yellow streaming cut fluorescence

14,570-14,600 SILTY SANDSTONE: medium gray brown-medium brown, common light brown, rare light gray, trace tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain, fast yellow streaming cut fluorescence

14,600-14,630 SILTY SANDSTONE: medium gray brown-medium brown, common light brown, rare light gray, trace tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain, fast yellow streaming cut fluorescence

14,630-14,660 SILTY SANDSTONE: medium gray brown-medium brown, common light brown, rare light gray, trace tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain, fast yellow streaming cut fluorescence

14,660-14,690 SILTY SANDSTONE: medium gray brown-medium brown, common light brown, rare light gray, trace tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement,

moderately cement, trace disseminated pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain, fast yellow streaming cut fluorescence

14,690-14,720 SILTY SANDSTONE: medium gray brown-medium brown, common light brown, rare light gray, trace tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain, fast yellow streaming cut fluorescence

14,720-14,750 SILTY SANDSTONE: medium gray brown-medium brown, common light brown, rare light gray, trace tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain, fast yellow streaming cut fluorescence

14,750-14,780 SILTY SANDSTONE: medium gray brown-medium brown, common light brown, rare light gray, trace tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain, fast yellow streaming cut fluorescence

14,780-14,810 SILTY SANDSTONE: medium brown-light brown, common light gray brown, trace tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescent

14,810-14,840 SILTY SANDSTONE: medium brown-light brown, common light gray brown, trace tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescent

14,840-14,870 SILTY SANDSTONE: medium brown-light brown, common light gray brown, trace tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescent

14,870-14,900 SILTY SANDSTONE: medium brown-light brown, common light gray brown, trace tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescent

14,900-14,930 SILTY SANDSTONE: medium brown-light brown, common light gray brown, trace tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescent

14,930-14,960 SILTY SANDSTONE: medium brown-light brown, common light gray brown, trace tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescent

14,960-14,990 SILTY SANDSTONE: medium brown-light brown, common light gray brown, trace tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescent

14,990-15,020 SILTY SANDSTONE: medium brown-light brown, common light gray brown, trace tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescent

15,020-15,050 SILTY SANDSTONE: medium brown-light brown, common light gray brown, trace tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescent

15,050-15,080 SILTY SANDSTONE: medium brown-light brown, common light gray brown, trace tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescent

15,080-15,110 SILTY SANDSTONE: light brown-medium brown, light gray brown-light gray, trace tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, common intercrystalline porosity, trace nodular pyrite, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescence

15,110-15,140 SILTY SANDSTONE: light brown-medium brown, light gray brown-light gray, trace tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, common intercrystalline porosity, trace nodular pyrite, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescence

15,140-15,170 SILTY SANDSTONE: light brown-medium brown, light gray brown-light gray, trace tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, common intercrystalline porosity, trace nodular pyrite, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescence

15,170-15,200 SILTY SANDSTONE: light brown-medium brown, light gray brown-light gray, trace tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, common intercrystalline porosity, trace nodular pyrite, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescence

15,200-15,230 SILTY SANDSTONE: light brown-medium brown, light gray brown-light gray, trace tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, common intercrystalline porosity, trace nodular pyrite, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescence

15,230-15,260 SILTY SANDSTONE: light brown-medium brown, light gray brown-light gray, trace tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, common intercrystalline porosity, trace nodular pyrite, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescence

15,260-15,290 SILTY SANDSTONE: light brown-medium brown, light gray brown-light gray, trace tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, common intercrystalline porosity, trace nodular pyrite, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescence

15,290-15,320 SILTY SANDSTONE: light brown-medium brown, light gray brown-light gray, trace tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, common intercrystalline porosity, trace nodular pyrite, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescence

15,320-15,350 SILTY SANDSTONE: light brown-medium brown, light gray brown-light gray, trace tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, common intercrystalline porosity, trace nodular pyrite, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescence

15,350-15,380 SILTY SANDSTONE: light brown-medium brown, light gray brown-light gray, trace tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, common intercrystalline porosity, trace nodular pyrite, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescence

15,380-15,410 SILTY SANDSTONE: light brown-medium brown, light gray brown-light gray, trace tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, common intercrystalline porosity, trace nodular pyrite, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescence

15,410-15,440 SILTY SANDSTONE: light brown-medium brown, light gray brown-light gray, trace tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, common intercrystalline porosity, trace nodular pyrite, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescence

15,440-15,470 SILTY SANDSTONE: light brown-medium brown, light gray brown-light gray, trace tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, common intercrystalline porosity, trace nodular pyrite, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescence

15,470-15,500 SILTY SANDSTONE: light gray brown, medium brown-light brown, rare gray, trace tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, trace nodular pyrite, common intercrystalline porosity, trace nodular pyrite, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescence

15,500-15,530 SILTY SANDSTONE: light gray brown, medium brown-light brown, rare gray, trace tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, trace nodular pyrite, common intercrystalline porosity, trace nodular pyrite, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescence

15,530-15,560 SILTY SANDSTONE: light gray brown, medium brown-light brown, rare gray, trace tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately

16,130-16,160 SILTY SANDSTONE: light gray brown, medium brown-light brown, rare tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, trace nodular pyrite, common intercrystalline porosity, trace nodular pyrite, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescence

16,160-16,190 SILTY SANDSTONE: light-medium gray brown, light brown, rare tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, trace nodular pyrite, common intercrystalline porosity, trace nodular pyrite, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescence

16,190-16,220 SILTY SANDSTONE: light-medium gray brown, light brown, rare tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, trace nodular pyrite, common intercrystalline porosity, trace nodular pyrite, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescence

16,220-16,250 SILTY SANDSTONE: light-medium gray brown, light brown, rare tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, trace nodular pyrite, common intercrystalline porosity, trace nodular pyrite, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescence

16,250-16,280 SILTY SANDSTONE: light-medium gray brown, light brown, rare tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, trace nodular pyrite, common intercrystalline porosity, trace nodular pyrite, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescence

16,280-16,310 SILTY SANDSTONE: medium-dark gray brown, occasional light brown gray, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, trace nodular pyrite, common intercrystalline porosity, trace nodular pyrite, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescence

16,310-16,340 SILTY SANDSTONE: medium-dark gray brown, occasional light brown gray, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, trace nodular pyrite, common intercrystalline porosity, trace nodular pyrite, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescence

16,340-16,370 SILTY SANDSTONE: medium-dark gray brown, occasional light brown gray, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, trace nodular pyrite, common intercrystalline porosity, trace nodular pyrite, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescence

16,370-16,400 SILTY SANDSTONE: medium-dark gray brown, occasional light brown gray, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, trace nodular pyrite, common intercrystalline porosity, trace nodular pyrite, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescence

16,400-16,430 SILTY SANDSTONE: medium-dark gray brown, occasional light brown gray, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace

disseminated pyrite, trace nodular pyrite, common intercrystalline porosity, trace nodular pyrite, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescence

16,430-16,460 SILTY SANDSTONE: medium-dark gray brown, occasional light brown gray, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, trace nodular pyrite, common intercrystalline porosity, trace nodular pyrite, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescence

16,460-16,490 SILTY SANDSTONE: light-medium gray brown, occasional light gray, occasional tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, trace nodular pyrite, common intercrystalline porosity, trace nodular pyrite, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescence

16,490-16,520 SILTY SANDSTONE: light-medium gray brown, occasional light gray, occasional tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, trace nodular pyrite, common intercrystalline porosity, trace nodular pyrite, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescence

16,520-16,550 SILTY SANDSTONE: light-medium gray brown, occasional light gray, occasional tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, trace nodular pyrite, common intercrystalline porosity, trace nodular pyrite, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescence

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

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

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

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

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

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

16,730-16,760 SILTY SANDSTONE: light-medium gray, occasional light gray brown, rare tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, trace nodular pyrite, common intercrystalline porosity, trace nodular pyrite, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescence

16,760-16,790 SILTY SANDSTONE: light-medium gray, occasional light gray brown, rare tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, trace nodular pyrite, common intercrystalline porosity, trace nodular pyrite, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescence

16,790-16,820 SILTY SANDSTONE: medium gray, occasional light gray brown, rare tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, trace nodular pyrite, common intercrystalline porosity, trace nodular pyrite, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescence

16,820-16,850 SILTY SANDSTONE: medium gray, occasional light gray brown, rare tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, trace nodular pyrite, common intercrystalline porosity, trace nodular pyrite, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescence

16,850-16,880 SILTY SANDSTONE: medium gray, occasional light gray brown, rare tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, trace nodular pyrite, common intercrystalline porosity, trace nodular pyrite, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescence

16,880-16,910 SILTY SANDSTONE: medium gray, occasional light gray brown, rare tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, trace nodular pyrite, common intercrystalline porosity, trace nodular pyrite, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescence

16,910-16,940 SILTY SANDSTONE: medium gray, occasional light gray brown, rare tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, trace nodular pyrite, common intercrystalline porosity, trace nodular pyrite, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescence

16,940-16,970 SILTY SANDSTONE: medium gray, occasional light gray brown, rare tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, trace nodular pyrite, common intercrystalline porosity, trace nodular pyrite, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescence

16,970-17,000 SILTY SANDSTONE: dark-medium gray, rare light gray brown, trace tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, trace nodular pyrite, common intercrystalline porosity, trace nodular pyrite, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescence

17,000-17,030 SILTY SANDSTONE: dark-medium gray, rare light gray brown, trace tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, trace nodular pyrite, common intercrystalline porosity, trace nodular pyrite, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescence

17,030-17,060 SILTY SANDSTONE: dark-medium gray, rare light gray brown, trace tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, trace nodular pyrite, common intercrystalline porosity, trace nodular pyrite, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescence

17,060-17,090 SILTY SANDSTONE: dark-medium gray, rare light gray brown, trace tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, trace nodular pyrite, common intercrystalline porosity, trace nodular pyrite, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescence

17,090-17,120 SILTY SANDSTONE: dark-medium gray, rare light gray brown, trace tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, trace nodular pyrite, common intercrystalline porosity, trace nodular pyrite, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescence

17,120-17,150 SILTY SANDSTONE: dark-medium gray, rare light gray brown, trace tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, trace nodular pyrite, common intercrystalline porosity, trace nodular pyrite, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescence

17,150-17,180 SILTY SANDSTONE: dark-medium gray, rare light gray brown, trace tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, trace nodular pyrite, common intercrystalline porosity, trace nodular pyrite, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescence

17,180-17,210 SILTY SANDSTONE: dark-medium gray, rare light gray brown, trace tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, trace nodular pyrite, common intercrystalline porosity, trace nodular pyrite, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescence

17,210-17,240 SILTY SANDSTONE: dark-medium gray, rare light gray brown, trace tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, trace nodular pyrite, common intercrystalline porosity, trace nodular pyrite, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescence

17,240-17,270 SILTY SANDSTONE: dark-medium gray, rare light gray brown, trace tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, trace nodular pyrite, common intercrystalline porosity, trace nodular pyrite, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescence

17,270-17,300 SILTY SANDSTONE: medium brown gray, rare light gray brown, light brown, trace tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately

cement, trace disseminated pyrite, trace nodular pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescence

17,300-17,330 SILTY SANDSTONE: medium brown gray, rare light gray brown, light brown, trace tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, trace nodular pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescence

17,330-17,360 SILTY SANDSTONE: medium brown gray, rare light gray brown, light brown, trace tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, trace nodular pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescence

17,360-17,390 SILTY SANDSTONE: medium brown gray, rare light gray brown, light brown, trace tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, trace nodular pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescence

17,390-17,420 SILTY SANDSTONE: medium brown gray, rare light gray brown, light brown, trace tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, trace nodular pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescence

17,420-17,450 SILTY SANDSTONE: medium brown gray, rare light gray brown, light brown, trace tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, trace nodular pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescence

17,450-17,480 SILTY SANDSTONE: medium brown gray, rare light gray brown, light brown, trace tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, trace nodular pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescence

17,480-17,510 SILTY SANDSTONE: medium brown gray, rare light gray brown, light brown, trace tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, trace nodular pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescence

17,510-17,540 SILTY SANDSTONE: medium brown gray, rare light gray brown, light brown, trace tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, trace nodular pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescence

17,540-17,570 SILTY SANDSTONE: medium brown gray, rare light gray brown, light brown, trace tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, trace nodular pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescence

17,570-17,600 SILTY SANDSTONE: medium brown gray, rare light gray brown, light brown, trace tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, trace nodular pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescence

17,600-17,630 SILTY SANDSTONE: light-medium brown gray, light brown, trace tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, trace nodular pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescence

17,630-17,660 SILTY SANDSTONE: light-medium brown gray, light brown, trace tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, trace nodular pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescence

17,660-17,690 SILTY SANDSTONE: light-medium brown gray, light brown, trace tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, trace nodular pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescence

17,690-17,720 SILTY SANDSTONE: light-medium brown gray, light brown, trace tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, trace nodular pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescence

17,720-17,750 SILTY SANDSTONE: light-medium brown gray, light brown, trace tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, trace nodular pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescence

17,750-17,780 SILTY SANDSTONE: light-medium brown, light gray brown, trace tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescence

17,810-17,840 SILTY SANDSTONE: light-medium brown, light gray brown, trace tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescence

17,780-17,810 SILTY SANDSTONE: light-medium brown, light gray brown, trace tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescence

17,840-17,870 SILTY SANDSTONE: light-medium brown, light gray brown, trace tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescence

17,870-17,900 SILTY SANDSTONE: light-medium brown, light gray brown, trace tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescence

17,900-17,930 SILTY SANDSTONE: light-medium brown, light gray brown, trace tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescence

17,930-17,960 SILTY SANDSTONE: light-medium brown, light gray brown, trace tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescence

17,960-17,990 SILTY SANDSTONE: medium brown, light brown-light gray brown, trace tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescence

17,990-18,020 SILTY SANDSTONE: light-medium brown, light gray brown, trace tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescence

18,020-18,050 SILTY SANDSTONE: light-medium brown, light gray brown, trace tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescence

18,050-18,080 SILTY SANDSTONE: light-medium brown, light gray brown, trace tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescence

18,080-18,110 SILTY SANDSTONE: medium-light brown, light gray brown, trace tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, trace nodular pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescence

18,110-18,140 SILTY SANDSTONE: medium-light brown, light gray brown, trace tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, trace nodular pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescence

18,140-18,170 SILTY SANDSTONE: medium-light brown, light gray brown, trace tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace

disseminated pyrite, trace nodular pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescence

18,170-18,200 SILTY SANDSTONE: medium-light brown, light gray brown, trace tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, trace nodular pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescence

18,200-18,230 SILTY SANDSTONE: medium-light brown, light gray brown, trace tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, trace nodular pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescence

18,230-18,260 SILTY SANDSTONE: medium-light brown, light gray brown, trace tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, trace nodular pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescence

18,260-18,290 SILTY SANDSTONE: medium-light brown, light gray brown, trace tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, trace nodular pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescence

18,290-18,320 SILTY SANDSTONE: medium-light brown, light gray brown, trace tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, trace nodular pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescence

18,320-18,350 SILTY SANDSTONE: medium-light brown, light gray brown, trace tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, trace nodular pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescence

18,350-18,380 SILTY SANDSTONE: medium-light brown, light gray brown, trace tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, trace nodular pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescence

18,380-18,410 SILTY SANDSTONE: medium-light brown, light gray brown, trace tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, trace nodular pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescence

18,410-18,440 SILTY SANDSTONE: medium-light brown, light gray brown, trace tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, trace nodular pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescence

18,740-18,770 SILTY SANDSTONE: medium brown gray, occasional gray, trace tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, trace nodular pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescence

18,770-18,800 SILTY SANDSTONE: medium brown gray, occasional gray, trace tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, trace nodular pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescence

18,800-18,830 SILTY SANDSTONE: light-medium gray brown, occasional gray, rare tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, trace nodular pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescence

18,830-18,860 SILTY SANDSTONE: light-medium gray brown, occasional gray, rare tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, trace nodular pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescence

18,860-18,890 SILTY SANDSTONE: light-medium gray brown, occasional gray, rare tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, trace nodular pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescence

18,890-18,920 SILTY SANDSTONE: light-medium gray brown, occasional gray, rare tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, trace nodular pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescence

18,920-18,950 SILTY SANDSTONE: light-medium gray brown, occasional gray, rare tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, trace nodular pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescence

18,950-18,980 SILTY SANDSTONE: light-medium gray brown, occasional gray, rare tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, trace nodular pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescence

18,980-19,010 SILTY SANDSTONE: light-medium gray, occasional gray brown, rare tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, trace nodular pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescence

19,010-19,040 SILTY SANDSTONE: light-medium gray, occasional gray brown, rare tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace

disseminated pyrite, trace nodular pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescence

19,040-19,070 SILTY SANDSTONE: light-medium gray, occasional gray brown, rare tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, trace nodular pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescence

19,070-19,100 SILTY SANDSTONE: light-medium gray, occasional gray brown, rare tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, trace nodular pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescence

19,100-19,130 SILTY SANDSTONE: light-medium gray, occasional gray brown, rare tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, trace nodular pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescence

19,130-19,160 SILTY SANDSTONE: light-medium gray, occasional gray brown, rare tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, trace nodular pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescence

19,160-19,190 SILTY SANDSTONE: light-medium gray, occasional gray brown, rare tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, trace nodular pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescence

19,190-19,220 SILTY SANDSTONE: light-medium gray brown, rare tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, trace nodular pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescence

19,220-19,250 SILTY SANDSTONE: light-medium gray brown, rare tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, trace nodular pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescence

9,250-19,280 SILTY SANDSTONE: light-medium gray brown, rare tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, trace nodular pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescence

19,280-19,310 SILTY SANDSTONE: light-medium gray brown, rare tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, trace nodular pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescence

19,310-19,340 SILTY SANDSTONE: light-medium gray brown, rare tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, trace nodular pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescence

19,340-19,370 SILTY SANDSTONE: light-medium gray brown, rare tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, trace nodular pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescence

19,370-19,400 SILTY SANDSTONE: medium-light brown, occasional light gray brown, rare tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescence

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

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

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

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

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

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

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

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

19,640-19,670 SILTY SANDSTONE: light brown-light gray brown, medium brown, rare tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, trace nodular pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescence

19,670-19,700 SILTY SANDSTONE: medium-light brown, occasional light gray brown, rare tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescence

19,700-19,730 SILTY SANDSTONE: medium-light brown, occasional light gray brown, rare tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescence

19,730-19,760 SILTY SANDSTONE: medium-light brown, occasional light gray brown, rare tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescence

19,760-19,790 SILTY SANDSTONE: medium-light brown, occasional light gray brown, rare tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescence

19,790-19,820 SILTY SANDSTONE: medium-light brown, occasional light gray brown, rare tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescence

19,820-19,850 SILTY SANDSTONE: medium-light brown, occasional light gray brown, rare tan-cream, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, trace disseminated pyrite, common intercrystalline porosity, common even-spotty medium-light brown oil stain, moderately yellow streaming cut fluorescence

19,850-19,880 SILTY SANDSTONE: medium brown, occasional light brown, rare tan-cream, trace light gray brown, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, common intercrystalline porosity, common even-spotty medium-light brown oil stain, fast yellow streaming cut fluorescence

19,880-19,910 SILTY SANDSTONE: medium brown, occasional light brown, rare tan-cream, trace light gray brown, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement,

moderately cement, common intercrystalline porosity, common even-spotty medium-light brown oil stain, fast yellow streaming cut fluorescence

19,910-19,940 SILTY SANDSTONE: medium brown, occasional light brown, rare tan-cream, trace light gray brown, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, common intercrystalline porosity, common even-spotty medium-light brown oil stain, fast yellow streaming cut fluorescence

19,940-19,970 SILTY SANDSTONE: medium brown, occasional light brown, rare tan-cream, trace light gray brown, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, common intercrystalline porosity, common even-spotty medium-light brown oil stain, fast yellow streaming cut fluorescence

19,970-20,000 SILTY SANDSTONE: medium brown, occasional light brown, rare tan-cream, trace light gray brown, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, common intercrystalline porosity, common even-spotty medium-light brown oil stain, fast yellow streaming cut fluorescence

20,000-20,030 SILTY SANDSTONE: medium brown, occasional light brown, rare tan-cream, trace light gray brown, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, common intercrystalline porosity, common even-spotty medium-light brown oil stain, fast yellow streaming cut fluorescence

20,030-20,060 SILTY SANDSTONE: medium brown, occasional light brown, rare tan-cream, trace light gray brown, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, common intercrystalline porosity, common even-spotty medium-light brown oil stain, fast yellow streaming cut fluorescence

20,060-20,090 SILTY SANDSTONE: medium brown, occasional light brown, rare tan-cream, trace light gray brown, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, common intercrystalline porosity, common even-spotty medium-light brown oil stain, fast yellow streaming cut fluorescence

20,090-20,120 SILTY SANDSTONE: medium brown, occasional light brown, rare tan-cream, trace light gray brown, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, common intercrystalline porosity, common even-spotty medium-light brown oil stain, fast yellow streaming cut fluorescence

20,120-20,150 SILTY SANDSTONE: medium brown-light brown, rare tan-cream, trace light gray brown, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, common intercrystalline porosity, common even-spotty medium-light brown oil stain, fast yellow streaming cut fluorescence

20,150-20,180 SILTY SANDSTONE: medium brown, occasional light brown, rare tan-cream, trace light gray brown, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, common intercrystalline porosity, common even-spotty medium-light brown oil stain, fast yellow streaming cut fluorescence

20,180-10,210 SILTY SANDSTONE: medium brown, occasional light brown, rare tan-cream, trace light gray brown, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, common intercrystalline porosity, common even-spotty medium-light brown oil stain, fast yellow streaming cut fluorescence

20,210-20,240 SILTY SANDSTONE: medium brown, occasional light brown, rare tan-cream, trace light gray brown, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, common intercrystalline porosity, common even-spotty medium-light brown oil stain, fast yellow streaming cut fluorescence

20,240-20,270 SILTY SANDSTONE: medium brown, occasional light brown, rare tan-cream, trace light gray brown, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, common intercrystalline porosity, common even-spotty medium-light brown oil stain, fast yellow streaming cut fluorescence

20,270-20,300 SILTY SANDSTONE: medium brown, occasional light brown, rare tan-cream, trace light gray brown, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, common intercrystalline porosity, common even-spotty medium-light brown oil stain, fast yellow streaming cut fluorescence

20,300-20,330 SILTY SANDSTONE: medium brown, occasional light brown, rare tan-cream, trace light gray brown, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, common intercrystalline porosity, common even-spotty medium-light brown oil stain, fast yellow streaming cut fluorescence

20,330-20,360 SILTY SANDSTONE: medium brown, occasional light brown, rare tan-cream, trace light gray brown, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, common intercrystalline porosity, common even-spotty medium-light brown oil stain, fast yellow streaming cut fluorescence

20,360-20,390 SILTY SANDSTONE: medium brown, occasional light brown, rare tan-cream, trace light gray brown, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, common intercrystalline porosity, common even-spotty medium-light brown oil stain, fast yellow streaming cut fluorescence

20,390-20,420 SILTY SANDSTONE: medium brown, occasional light brown, rare tan-cream, trace light gray brown, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, common intercrystalline porosity, common even-spotty medium-light brown oil stain, fast yellow streaming cut fluorescence

20,420-20,440 SILTY SANDSTONE: medium brown, occasional light brown, rare tan-cream, trace light gray brown, very fine grained, firm-friable, sub rounded-sub angular, smooth, moderately sorted, calcite cement, moderately cement, common intercrystalline porosity, common even-spotty medium-light brown oil stain, fast yellow streaming cut fluorescence



Directional Survey Certification

Operator: Oasis Petroleum LLC **Well Name:** Chalmers 5300 21-19 9T2 **API:** 33-053-06023

Enseco Job#: S14008-02 **Job Type:** MWD D&I **County, State:** McKenzie County, N. Dakota

Well Surface Hole Location (SHL): Lot 2 , Sec. 19, T1153N, R100W (2,259' FNL & 326 FWL)

Latitude: 48° 03' 40.97 N **Longitude:** 103° 36' 10.11 W **Datum:** Nad 83

Final MWD Report Date: Dec. 08, 2014 **MWD Survey Run Date:** Dec. 06, 2014 to Dec. 08, 2014

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

MWD Surveyed from 00 ft to 2,150.0 ft MD **Survey Type:** Positive Pulse D&I MWD **Sensor to Bit:** 35 ft

Rig Contractor: Nabors **Rig Number:** B22 **RKB Height:** 2,079.0 ft **GL Elevation:** 2,054.0 ft

MWD Surveyor Name: David Hopper

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

Jonathan Hovland, Well Planner

Enseco Representative Name, Title

Jonathan Hovland

Signature

December 9th 2014

Date Signed

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

Seal: _____

Notary Public

Commission Expiry



Enseco Survey Report

09 December, 2014

Continental Resources

McKenzie County, N. Dakota

Lot 2 Sec.19 Twp.153N Rge.100W

Chalmers 5300 21-19 9T2

Job # S14008-02

API#: 33-053-06023

Survey: Final Surveys Vertical Section





Survey Report



Company:	Continental Resources	Local Co-ordinate Reference:	Well Chalmers 5300 21-19 9T2
Project:	McKenzie County, N. Dakota	Ground Level Elevation:	2,054.00usft
Site:	Lot 2 Sec.19 Twp.153N Rge.100W	Wellhead Elevation:	KB 25 @ 2079.00usft (Nabors B22)
Well:	Chalmers 5300 21-19 9T2	North Reference:	True
Wellbore:	Job # S14008-02	Survey Calculation Method:	Minimum Curvature
Design:	Final Surveys Vertical Section	Database:	EDM5000

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

Site	Lot 2 Sec.19 Twp.153N Rge.100W		
Site Position:	Northing:	402,374.71 usft	Latitude: 48° 3' 40.320 N
From: Lat/Long	Easting:	1,209,981.92 usft	Longitude: 103° 36' 10.110 W
Position Uncertainty:	0.00 usft	Slot Radius: 13-3/16 "	Grid Convergence: -2.309°

Well	Chalmers 5300 21-19 9T2	API#: 33-053-06023				
Well Position	+N/-S +E/-W	65.86 usft 0.00 usft	Northing: Easting:	402,440.51 usft 1,209,984.57 usft	Latitude: Longitude:	48° 3' 40.970 N 103° 36' 10.110 W
Position Uncertainty		0.00 usft	Wellhead Elevation:	2,079.00 usft	Ground Level:	2,054.00usft

Wellbore	Job # S14008-02				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	12/9/2014	8.181	72.957	56,376

Design:	Final Surveys Vertical Section	Survey Error Model:	Standard ISCWSA MWD Tool		
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.00
Vertical Section:		Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
		0.00	0.00	0.00	141.30



Survey Report



Company:	Continental Resources	Local Co-ordinate Reference:	Well Chalmers 5300 21-19 9T2
Project:	McKenzie County, N. Dakota	Ground Level Elevation:	2,054.00usft
Site:	Lot 2 Sec.19 Twp.153N Rge.100W	Wellhead Elevation:	KB 25 @ 2079.00usft (Nabors B22)
Well:	Chalmers 5300 21-19 9T2	North Reference:	True
Wellbore:	Job # S14008-02	Survey Calculation Method:	Minimum Curvature
Design:	Final Surveys Vertical Section	Database:	EDM5000

Survey										
MD (usft)	Inc (°)	Azi (°)	TVD (usft)	SS (usft)	+N-S (usft)	+E/W (usft)	Vertical Section (usft)	Dogleg Rate (%/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
Tie-in from Surface										
0.00	0.00	0.00	0.00	2,079.00	0.00	0.00	0.00	0.00	0.00	0.00
160.00	0.50	89.80	160.00	1,919.00	0.00	0.70	0.43	0.31	0.31	0.00
251.00	1.10	110.50	250.99	1,828.01	-0.30	1.91	1.43	0.72	0.66	22.75
342.00	0.90	108.00	341.97	1,737.03	-0.83	3.41	2.78	0.22	-0.22	-2.75
429.00	0.40	120.00	428.97	1,650.03	-1.19	4.32	3.63	0.59	-0.57	13.79
515.00	0.50	138.60	514.97	1,564.03	-1.62	4.83	4.29	0.20	0.12	21.63
599.00	0.40	145.70	598.96	1,480.04	-2.14	5.24	4.95	0.14	-0.12	8.45
688.00	0.20	212.80	687.96	1,391.04	-2.53	5.33	5.31	0.42	-0.22	75.39
774.00	0.40	173.40	773.96	1,305.04	-2.95	5.28	5.61	0.32	0.23	-45.81
864.00	0.40	186.80	863.96	1,215.04	-3.58	5.28	6.09	0.10	0.00	14.89
950.00	0.50	176.20	949.96	1,129.04	-4.25	5.27	6.61	0.15	0.12	-12.33
1,040.00	0.50	182.90	1,039.95	1,039.05	-5.03	5.28	7.23	0.06	0.00	7.44
1,131.00	0.50	194.20	1,130.95	948.05	-5.81	5.16	7.76	0.11	0.00	12.42
1,218.00	0.40	227.20	1,217.95	861.05	-6.39	4.84	8.01	0.31	-0.11	37.93
1,305.00	0.20	264.30	1,304.95	774.05	-6.61	4.47	7.95	0.31	-0.23	42.64
1,391.00	0.40	283.80	1,390.95	688.05	-6.55	4.03	7.63	0.26	0.23	22.67
1,480.00	0.20	103.70	1,479.94	599.06	-6.52	3.88	7.51	0.67	-0.22	202.13
1,570.00	0.20	117.50	1,569.94	509.06	-6.63	4.17	7.78	0.05	0.00	15.33
1,657.00	0.20	347.80	1,656.94	422.06	-6.55	4.27	7.78	0.42	0.00	-149.08
1,743.00	0.20	30.70	1,742.94	336.06	-6.27	4.32	7.59	0.17	0.00	49.88
1,833.00	0.20	300.30	1,832.94	246.06	-6.06	4.26	7.39	0.32	0.00	-100.44
1,921.00	0.40	70.40	1,920.94	158.06	-5.88	4.42	7.35	0.63	0.23	147.84
2,007.00	0.40	111.20	2,006.94	72.06	-5.88	4.98	7.71	0.32	0.00	47.44
2,097.00	0.50	169.20	2,096.94	-17.94	-6.38	5.35	8.33	0.49	0.11	64.44
Last MWD Survey										
2,150.00	0.50	160.10	2,149.94	-70.94	-6.83	5.47	8.75	0.15	0.00	-17.17

Survey Annotations					
Local Coordinates					
MD (usft)	TVD (usft)	+N-S (usft)	+E/W (usft)	Comment	
0.00	0.00	0.00	0.00	Tie-in from Surface	
2,150.00	2,149.94	-6.83	5.47	Last MWD Survey	



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

Friday, February 27, 2015

State of North Dakota

Subject: **Surveys**

Re: **Oasis**
Chalmers 5300 21-19 9B
McKenzie, ND

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

Surveyor Name	Surveyor Title	Borehole Number	Start Depth	End Depth	Start Date	End Date	Type of	TD Straight Line Projection
Mike McCammond	MWD Operator	O.H.	2160'	11068'	01/02/15	01/11/15	MWD	11128'
Mike McCammond	MWD Operator	O.H.	11068'	20372'	02/21/15	02/26/15	MWD	20440'

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

A handwritten signature in black ink that reads "Douglas Hudson".

Douglas Hudson
Well Planner



RYAN DIRECTIONAL SERVICES, INC.
A NABORS COMPANY

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

Sunday, January 11, 2015

State of North Dakota
County of McKenzie

Subject: **Survey Certification Letter**

Survey Company: Ryan Directional Services, Inc.

Job Number: 8418

Survey Job Type: Ryan MWD

Customer: Oasis Petroleum

Well Name: Chalmers 5300 21-19 9B

Rig Name: Nabors B-22

Surface: 48 3' 40.970 N / 103 36' 10.110 W

A.P.I. No: 33-053-06023

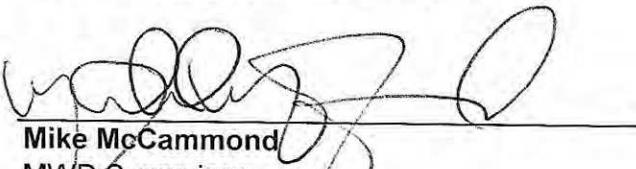
Location: McKenzie, ND

RKB Height: 2071'

Distance to Bit: 60'

<i>Surveyor Name</i>	<i>Surveyor Title</i>	<i>Borehole Number</i>	<i>Start Depth</i>	<i>End Depth</i>	<i>Start Date</i>	<i>End Date</i>	<i>Type of</i>	<i>TD Straight Line Projection</i>
Mike McCommand	MWD Supervisor	OH	2236'	11068'	01/02/15	01/11/15	MWD	11128'

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


Mike McCommand
MWD Supervisor
Ryan Directional Services, Inc.



RYAN DIRECTIONAL SERVICES, INC.

A NABORS COMPANY

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

Thursday, February 26, 2015

State of North Dakota
County of McKenzie County

Subject: **Survey Certification Letter**

Survey Company: Ryan Directional Services, Inc.

Job Number: 8724

Survey Job Type: Ryan MWD

Customer: Oasis Petroleum

Well Name: Chalmers 5300 21-19 9B

Rig Name: Nabors B22

Surface: 48 3' 40.970 N / 103 36' 10.110 W

A.P.I. No: 33-053-06023

Location: McKenzie County, North Dakota

RKB Height: 2071'

Distance to Bit: 68'

<i>Surveyor Name</i>	<i>Surveyor Title</i>	<i>Borehole Number</i>	<i>Start Depth</i>	<i>End Depth</i>	<i>Start Date</i>	<i>End Date</i>	<i>Type of</i>	<i>TD Straight Line Projection</i>
Mike McCommadon	MWD Supervisor	OH	11094'	20372'	02/21/15	02/26/15	MWD	20440'

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


Mike McCommadon

MWD Supervisor

Ryan Directional Services, Inc.



SURVEY REPORT

Customer: **Oasis Petroleum**
Well Name: **Chalmers 5300 21-19 9B**
Rig #: **Nabors B-22**
API #: **33-053-06023**
Calculation Method: **Minimum Curvature Calculation**

MWD Operator: **McCommard / Hungerford**
Directional Drillers: **RPM**
Survey Corrected To: **True North**
Vertical Section Direction: **90**
Total Correction: **8.17**
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	2150	0.5	160.1	0	2149.94	5.47	-6.83	5.47	0.15
1	2236	0.60	156.80	60.00	2235.94	5.78	-7.60	5.78	0.12
2	2267	0.80	151.30	64.00	2266.93	5.94	-7.94	5.94	0.68
3	2361	0.70	20.20	69.00	2360.93	6.46	-7.97	6.46	1.45
4	2454	0.70	14.50	73.00	2453.92	6.79	-6.89	6.79	0.07
5	2547	0.40	359.30	77.00	2546.92	6.93	-6.01	6.93	0.36
6	2641	0.40	0.40	80.00	2640.92	6.93	-5.36	6.93	0.01
7	2734	0.40	350.00	84.00	2733.91	6.88	-4.71	6.88	0.08
8	2828	0.50	330.40	84.00	2827.91	6.62	-4.03	6.62	0.19
9	2921	0.50	324.90	84.00	2920.91	6.18	-3.35	6.18	0.05
10	3014	0.60	322.50	87.00	3013.90	5.65	-2.63	5.65	0.11
11	3108	0.60	323.30	94.00	3107.90	5.06	-1.85	5.06	0.01
12	3201	0.70	328.60	95.00	3200.89	4.47	-0.97	4.47	0.13
13	3294	0.60	311.10	96.00	3293.89	3.81	-0.17	3.81	0.24
14	3388	0.50	311.00	100.00	3387.88	3.13	0.43	3.13	0.11
15	3481	0.50	321.20	102.00	3480.88	2.57	1.01	2.57	0.10
16	3575	0.40	308.90	105.00	3574.88	2.06	1.53	2.06	0.15
17	3668	0.40	317.70	107.00	3667.87	1.59	1.98	1.59	0.07
18	3761	0.30	297.20	107.00	3760.87	1.15	2.33	1.15	0.17
19	3855	0.30	285.00	111.00	3854.87	0.69	2.51	0.69	0.07
20	3948	0.20	307.70	113.00	3947.87	0.33	2.67	0.33	0.15
21	4041	0.30	279.70	114.00	4040.87	-0.04	2.81	-0.04	0.17
22	4135	0.40	294.20	116.00	4134.87	-0.58	2.98	-0.58	0.14
23	4228	0.40	276.20	118.00	4227.86	-1.20	3.15	-1.20	0.13
24	4321	0.30	242.90	120.00	4320.86	-1.74	3.08	-1.74	0.24
25	4415	0.40	238.10	122.00	4414.86	-2.24	2.79	-2.24	0.11
26	4508	0.50	253.70	123.00	4507.86	-2.90	2.51	-2.90	0.17
27	4601	0.50	252.90	125.00	4600.85	-3.68	2.27	-3.68	0.01
28	4695	0.70	258.80	125.00	4694.85	-4.63	2.04	-4.63	0.22
29	4788	0.70	232.60	129.00	4787.84	-5.64	1.59	-5.64	0.34
30	4882	0.60	234.00	129.00	4881.84	-6.50	0.95	-6.50	0.11
31	4975	0.70	236.30	131.00	4974.83	-7.36	0.35	-7.36	0.11
32	5068	0.60	77.10	132.00	5067.83	-7.36	0.14	-7.36	1.38
33	5162	0.60	76.30	134.00	5161.82	-6.40	0.37	-6.40	0.01
34	5255	0.70	67.30	136.00	5254.82	-5.41	0.70	-5.41	0.15
35	5348	0.60	55.20	140.00	5347.81	-4.48	1.20	-4.48	0.18
36	5442	0.40	69.50	141.00	5441.81	-3.77	1.59	-3.77	0.25
37	5535	0.50	57.50	143.00	5534.81	-3.12	1.93	-3.12	0.15
38	5628	0.40	25.00	145.00	5627.80	-2.64	2.44	-2.64	0.29
39	5722	0.60	59.70	147.00	5721.80	-2.08	2.98	-2.08	0.38
40	5815	0.40	73.60	149.00	5814.80	-1.35	3.32	-1.35	0.25
41	5908	0.40	87.10	150.00	5907.79	-0.71	3.43	-0.71	0.10
42	6001	0.30	108.20	152.00	6000.79	-0.16	3.37	-0.16	0.17
43	6026	0.30	73.10	152.00	6025.79	-0.03	3.37	-0.03	0.72
44	6089	0.10	43.40	114.00	6088.79	0.16	3.46	0.16	0.35
45	6182	0.30	62.70	120.00	6181.79	0.43	3.63	0.43	0.22
46	6276	0.30	54.00	127.00	6275.79	0.85	3.88	0.85	0.05
47	6369	0.10	355.60	132.00	6368.79	1.04	4.11	1.04	0.28
48	6463	0.20	214.30	138.00	6462.79	0.94	4.05	0.94	0.30
49	6556	0.50	225.80	143.00	6555.79	0.56	3.64	0.56	0.33
50	6649	0.70	217.00	145.00	6648.78	-0.07	2.90	-0.07	0.24
51	6743	0.80	206.70	149.00	6742.77	-0.71	1.86	-0.71	0.18
52	6836	1.10	216.30	152.00	6835.76	-1.53	0.56	-1.53	0.36
53	6929	0.40	247.20	156.00	6928.75	-2.36	-0.29	-2.36	0.84
54	7023	0.40	252.70	154.00	7022.75	-2.97	-0.51	-2.97	0.04
55	7116	0.50	249.30	158.00	7115.75	-3.66	-0.75	-3.66	0.11
56	7209	0.00	67.90	159.00	7208.75	-4.04	-0.90	-4.04	0.54
57	7303	0.30	114.90	161.00	7302.75	-3.82	-1.00	-3.82	0.32
58	7396	0.30	166.90	165.00	7395.74	-3.54	-1.34	-3.54	0.28
59	7489	0.50	248.00	167.00	7488.74	-3.87	-1.73	-3.87	0.58
60	7583	0.60	252.10	168.00	7582.74	-4.71	-2.03	-4.71	0.11

**SURVEY REPORT**

Customer: **Oasis Petroleum**
 Well Name: **Chalmers 5300 21-19 9B**
 Rig #: **Nabors B-22**
 API #: **33-053-06023**
 Calculation Method: **Minimum Curvature Calculation**

MWD Operator: **McCammond / Hungerford**
 Directional Drillers: **RPM**
 Survey Corrected To: **True North**
 Vertical Section Direction: **90**
 Total Correction: **8.17**
 Temperature Forecasting Model (Chart Only): **Logarithmic**

Survey #	MD	Inc	Azm	Temp	TVD	VS	N/S	E/W	DLS
61	7676	0.60	260.20	174.00	7675.73	-5.66	-2.27	-5.66	0.09
62	7769	0.60	20.60	177.00	7768.73	-5.97	-1.89	-5.97	1.12
63	7863	0.40	4.20	179.00	7862.73	-5.77	-1.11	-5.77	0.26
64	7956	0.20	356.60	181.00	7955.73	-5.75	-0.62	-5.75	0.22
65	8050	0.50	248.70	185.00	8049.72	-6.15	-0.61	-6.15	0.63
66	8143	0.40	109.60	186.00	8142.72	-6.22	-0.86	-6.22	0.91
67	8236	0.40	102.70	188.00	8235.72	-5.60	-1.04	-5.60	0.05
68	8330	0.30	99.10	190.00	8329.72	-5.03	-1.15	-5.03	0.11
69	8423	0.40	120.20	185.00	8422.72	-4.51	-1.36	-4.51	0.17
70	8516	0.60	115.40	190.00	8515.71	-3.79	-1.73	-3.79	0.22
71	8610	0.90	63.80	194.00	8609.71	-2.68	-1.61	-2.68	0.75
72	8703	0.80	67.10	195.00	8702.70	-1.43	-1.04	-1.43	0.12
73	8796	0.90	60.50	199.00	8795.69	-0.20	-0.43	-0.20	0.15
74	8890	0.70	57.60	203.00	8889.68	0.93	0.25	0.93	0.22
75	8983	0.70	54.60	204.00	8982.67	1.87	0.88	1.87	0.04
76	9076	0.60	35.60	208.00	9075.66	2.62	1.60	2.62	0.25
77	9170	0.50	48.50	210.00	9169.66	3.21	2.28	3.21	0.17
78	9263	0.50	31.50	206.00	9262.66	3.73	2.89	3.73	0.16
79	9357	0.30	57.40	208.00	9356.65	4.15	3.37	4.15	0.28
80	9450	0.20	18.80	208.00	9449.65	4.41	3.66	4.41	0.20
81	9543	0.70	204.50	206.00	9542.65	4.22	3.30	4.22	0.97
82	9637	0.80	195.40	208.00	9636.64	3.81	2.14	3.81	0.17
83	9730	0.80	200.50	208.00	9729.63	3.41	0.91	3.41	0.08
84	9824	0.80	198.60	210.00	9823.63	2.97	-0.33	2.97	0.03
85	9917	0.80	196.70	212.00	9916.62	2.58	-1.57	2.58	0.03
86	10010	0.70	209.90	213.00	10009.61	2.11	-2.68	2.11	0.21
87	10104	0.50	209.00	213.00	10103.60	1.62	-3.54	1.62	0.21
88	10173	0.40	206.80	215.00	10172.60	1.37	-4.02	1.37	0.15
89	10228	0.30	216.00	185.00	10227.60	1.20	-4.30	1.20	0.21
90	10259	1.70	114.40	185.00	10258.60	1.57	-4.56	1.57	5.76
91	10290	6.40	107.70	185.00	10289.51	3.64	-5.28	3.64	15.21
92	10321	11.00	107.80	185.00	10320.14	8.10	-6.71	8.10	14.84
93	10352	14.70	115.00	186.00	10350.36	14.48	-9.27	14.48	12.98
94	10384	18.90	113.60	188.00	10380.99	22.92	-13.07	22.92	13.18
95	10415	22.20	106.30	190.00	10410.02	33.14	-16.72	33.14	13.46
96	10446	25.50	98.50	192.00	10438.38	45.37	-19.35	45.37	14.70
97	10477	27.80	96.80	192.00	10466.08	59.15	-21.20	59.15	7.82
98	10508	29.60	95.90	192.00	10493.27	73.94	-22.84	73.94	5.97
99	10539	31.30	94.70	194.00	10520.00	89.59	-24.29	89.59	5.82
100	10570	34.80	96.50	194.00	10545.98	106.41	-25.95	106.41	11.72
101	10601	38.50	99.60	195.00	10570.85	124.72	-28.56	124.72	13.34
102	10633	43.10	102.20	197.00	10595.06	145.24	-32.53	145.24	15.32
103	10664	47.60	103.20	197.00	10616.85	166.74	-37.39	166.74	14.70
104	10695	50.80	104.10	199.00	10637.10	189.54	-42.93	189.54	10.55
105	10726	54.60	103.60	199.00	10655.88	213.48	-48.83	213.48	12.32
106	10757	57.10	104.40	199.00	10673.28	238.37	-55.04	238.37	8.34
107	10788	61.70	104.10	199.00	10689.06	264.23	-61.60	264.23	14.86
108	10819	66.20	103.00	201.00	10702.67	291.30	-68.12	291.30	14.86
109	10850	69.30	102.60	199.00	10714.41	319.27	-74.47	319.27	10.07
110	10882	70.30	103.10	199.00	10725.46	348.55	-81.15	348.55	3.45
111	10913	75.70	102.20	201.00	10734.52	377.47	-87.64	377.47	17.64
112	10944	79.20	102.50	199.00	10741.25	407.02	-94.11	407.02	11.33
113	10975	79.40	102.10	199.00	10747.01	436.78	-100.60	436.78	1.42
114	11006	82.20	101.20	201.00	10751.96	466.75	-106.78	466.75	9.48
115	11037	86.40	103.10	203.00	10755.04	496.90	-113.27	496.90	14.86
116	11068	88.10	104.50	204.00	10756.53	526.97	-120.66	526.97	7.10
117	11094	88.60	103.10	219.00	10757.28	552.20	-126.86	552.20	5.72
118	11126	89.00	103.70	215.00	10757.95	583.33	-134.27	583.33	2.25
119	11158	89.70	103.10	233.00	10758.31	614.45	-141.69	614.45	2.88
120	11190	89.60	102.90	237.00	10758.51	645.63	-148.88	645.63	0.70



SURVEY REPORT

Customer: **Oasis Petroleum**
Well Name: **Chalmers 5300 21-19 9B**
Rig #: **Nabors B-22**
API #: **33-053-06023**
Calculation Method: **Minimum Curvature Calculation**

MWD Operator: **McCammond / Hungerford**
Directional Drillers: **RPM**
Survey Corrected To: **True North**
Vertical Section Direction: **90**
Total Correction: **8.17**
Temperature Forecasting Model (Chart Only): **Logarithmic**

Survey #	MD	Inc	Azm	Temp	TVD	VS	N/S	E/W	DLS
121	11220	89.90	103.30	215.00	10758.64	674.85	-155.68	674.85	1.67
122	11252	89.90	103.80	213.00	10758.69	705.96	-163.18	705.96	1.56
123	11282	90.20	103.70	213.00	10758.67	735.10	-170.31	735.10	1.05
124	11312	90.20	101.80	213.00	10758.56	764.36	-176.93	764.36	6.33
125	11344	90.70	101.20	215.00	10758.31	795.72	-183.31	795.72	2.44
126	11375	90.70	100.80	215.00	10757.93	826.14	-189.23	826.14	1.29
127	11405	89.90	98.40	215.00	10757.77	855.72	-194.23	855.72	8.43
128	11437	89.70	97.60	213.00	10757.89	887.41	-198.68	887.41	2.58
129	11468	89.60	97.00	215.00	10758.08	918.16	-202.62	918.16	1.96
130	11500	89.30	94.60	213.00	10758.38	949.99	-205.85	949.99	7.56
131	11531	89.10	92.80	233.00	10758.82	980.92	-207.85	980.92	5.84
132	11563	88.20	90.70	228.00	10759.57	1012.89	-208.83	1012.89	7.14
133	11595	88.10	90.40	228.00	10760.60	1044.88	-209.14	1044.88	0.99
134	11688	87.30	88.10	226.00	10764.33	1137.79	-207.92	1137.79	2.62
135	11781	90.00	89.30	228.00	10766.53	1230.73	-205.81	1230.73	3.18
136	11874	91.50	89.00	228.00	10765.31	1323.71	-204.43	1323.71	1.64
137	11966	89.90	88.40	230.00	10764.18	1415.67	-202.35	1415.67	1.86
138	12061	88.70	86.70	231.00	10765.35	1510.57	-198.29	1510.57	2.19
139	12156	89.20	87.00	233.00	10767.09	1605.41	-193.07	1605.41	0.61
140	12251	90.90	87.30	235.00	10767.00	1700.29	-188.34	1700.29	1.82
141	12345	90.50	88.00	235.00	10765.85	1794.20	-184.49	1794.20	0.86
142	12440	87.70	86.60	237.00	10767.35	1889.08	-180.02	1889.08	3.30
143	12535	88.30	87.90	240.00	10770.66	1983.91	-175.46	1983.91	1.51
144	12630	89.30	87.50	240.00	10772.65	2078.81	-171.65	2078.81	1.13
145	12724	89.10	88.10	240.00	10773.96	2172.73	-168.04	2172.73	0.67
146	12819	88.00	87.70	242.00	10776.37	2267.63	-164.56	2267.63	1.23
147	12914	87.60	88.80	240.00	10780.02	2362.52	-161.66	2362.52	1.23
148	13009	89.90	90.40	242.00	10782.09	2457.48	-161.00	2457.48	2.95
149	13103	91.70	91.50	244.00	10780.78	2551.45	-162.56	2551.45	2.24
150	13198	91.10	90.10	246.00	10778.45	2646.41	-163.88	2646.41	1.60
151	13293	89.10	91.30	246.00	10778.29	2741.40	-165.05	2741.40	2.46
152	13388	89.70	91.50	249.00	10779.28	2836.37	-167.37	2836.37	0.67
153	13482	87.40	90.70	249.00	10781.66	2930.31	-169.17	2930.31	2.59
154	13577	87.60	90.80	251.00	10785.81	3025.21	-170.41	3025.21	0.24
155	13672	88.50	90.80	251.00	10789.04	3120.15	-171.74	3120.15	0.95
156	13767	89.90	90.10	253.00	10790.36	3215.13	-172.48	3215.13	1.65
157	13861	90.10	90.80	253.00	10790.36	3309.13	-173.22	3309.13	0.77
158	13956	89.20	91.40	251.00	10790.94	3404.11	-175.05	3404.11	1.14
159	14051	90.30	92.80	255.00	10791.36	3499.04	-178.53	3499.04	1.87
160	14146	90.70	91.90	251.00	10790.53	3593.96	-182.42	3593.96	1.04
161	14241	89.70	89.10	251.00	10790.20	3688.94	-183.25	3688.94	3.13
162	14335	89.50	87.60	255.00	10790.85	3782.90	-180.54	3782.90	1.61
163	14430	89.80	88.20	255.00	10791.44	3877.83	-177.06	3877.83	0.71
164	14525	90.40	87.30	255.00	10791.27	3972.76	-173.33	3972.76	1.14
165	14620	89.10	87.70	255.00	10791.68	4067.66	-169.19	4067.66	1.43
166	14714	89.10	87.10	257.00	10793.16	4161.55	-164.93	4161.55	0.64
167	14810	88.20	86.40	253.00	10795.42	4257.37	-159.49	4257.37	1.19
168	14905	90.30	88.50	257.00	10796.67	4352.26	-155.26	4352.26	3.13
169	15000	89.20	88.90	258.00	10797.08	4447.23	-153.11	4447.23	1.23
170	15094	88.10	88.50	258.00	10799.29	4541.18	-150.97	4541.18	1.25
171	15189	88.70	89.00	260.00	10801.95	4636.12	-148.90	4636.12	0.82
172	15284	89.70	89.20	262.00	10803.27	4731.10	-147.41	4731.10	1.07
173	15379	89.70	90.00	260.00	10803.77	4826.09	-146.75	4826.09	0.84
174	15474	89.00	90.70	260.00	10804.85	4921.08	-147.33	4921.08	1.04
175	15568	87.80	91.70	260.00	10807.47	5015.02	-149.29	5015.02	1.66
176	15663	87.30	92.00	262.00	10811.53	5109.89	-152.36	5109.89	0.61
177	15758	87.10	91.70	264.00	10816.18	5204.72	-155.42	5204.72	0.38
178	15853	89.00	90.60	262.00	10819.41	5299.64	-157.33	5299.64	2.31
179	15948	88.40	90.70	264.00	10821.56	5394.61	-158.40	5394.61	0.64
180	16043	90.10	91.00	264.00	10822.81	5489.59	-159.81	5489.59	1.82



SURVEY REPORT

Customer: **Oasis Petroleum**
 Well Name: **Chalmers 5300 21-19 9B**
 Rig #: **Nabors B-22**
 API #: **33-053-06023**
 Calculation Method: **Minimum Curvature Calculation**

MWD Operator: **McCammond / Hungerford**
 Directional Drillers: **RPM**
 Survey Corrected To: **True North**
 Vertical Section Direction: **90**
 Total Correction: **8.17**
 Temperature Forecasting Model (Chart Only): **Logarithmic**

Survey #	MD	Inc	Azm	Temp	TVD	VS	N/S	E/W	DLS
181	16137	90.00	90.80	264.00	10822.72	5583.58	-161.29	5583.58	0.24
182	16232	91.10	90.80	264.00	10821.81	5678.56	-162.62	5678.56	1.16
183	16327	91.30	90.60	266.00	10819.82	5773.53	-163.78	5773.53	0.30
184	16422	91.20	90.50	266.00	10817.75	5868.51	-164.69	5868.51	0.15
185	16516	90.30	90.10	266.00	10816.52	5962.50	-165.18	5962.50	1.05
186	16611	90.00	90.00	267.00	10816.27	6057.50	-165.26	6057.50	0.33
187	16706	89.90	90.00	267.00	10816.35	6152.50	-165.26	6152.50	0.11
188	16800	89.90	90.10	267.00	10816.52	6246.50	-165.35	6246.50	0.11
189	16895	89.70	90.20	267.00	10816.85	6341.50	-165.59	6341.50	0.24
190	16990	88.70	89.90	269.00	10818.18	6436.49	-165.68	6436.49	1.10
191	17085	89.50	91.00	267.00	10819.67	6531.47	-166.42	6531.47	1.43
192	17180	91.30	91.60	267.00	10819.01	6626.44	-168.58	6626.44	2.00
193	17274	91.10	91.60	269.00	10817.04	6720.38	-171.20	6720.38	0.21
194	17369	87.80	89.80	267.00	10817.95	6815.35	-172.36	6815.35	3.96
195	17464	87.60	89.50	267.00	10821.76	6910.27	-171.78	6910.27	0.38
196	17559	87.90	89.50	267.00	10825.49	7005.20	-170.95	7005.20	0.32
197	17654	89.00	88.80	266.00	10828.06	7100.15	-169.55	7100.15	1.37
198	17748	90.50	89.00	269.00	10828.47	7194.13	-167.74	7194.13	1.61
199	17843	90.50	89.50	267.00	10827.64	7289.12	-166.50	7289.12	0.53
200	17938	90.10	89.30	269.00	10827.14	7384.11	-165.50	7384.11	0.47
201	18033	88.70	88.50	269.00	10828.14	7479.08	-163.68	7479.08	1.70
202	18127	89.70	89.20	267.00	10829.45	7573.05	-161.79	7573.05	1.30
203	18222	88.90	88.70	269.00	10830.61	7668.03	-160.05	7668.03	0.99
204	18317	89.60	89.80	267.00	10831.86	7763.01	-158.81	7763.01	1.37
205	18412	90.30	90.80	269.00	10831.94	7858.01	-159.31	7858.01	1.28
206	18506	90.00	90.80	271.00	10831.69	7952.00	-160.62	7952.00	0.32
207	18601	89.20	90.00	271.00	10832.36	8046.99	-161.28	8046.99	1.19
208	18696	89.30	90.50	269.00	10833.60	8141.98	-161.70	8141.98	0.54
209	18791	88.70	90.30	271.00	10835.26	8236.97	-162.36	8236.97	0.67
210	18886	90.00	90.80	269.00	10836.34	8331.95	-163.27	8331.95	1.47
211	18980	89.60	90.80	267.00	10836.66	8425.94	-164.58	8425.94	0.43
212	19075	91.30	90.80	271.00	10835.92	8520.93	-165.91	8520.93	1.79
213	19170	91.00	90.20	271.00	10834.01	8615.90	-166.74	8615.90	0.71
214	19265	89.90	88.80	273.00	10833.26	8710.89	-165.91	8710.89	1.87
215	19360	90.50	89.60	271.00	10832.93	8805.88	-164.58	8805.88	1.05
216	19454	90.30	89.50	271.00	10832.28	8899.88	-163.85	8899.88	0.24
217	19549	90.30	89.30	271.00	10831.78	8994.87	-162.85	8994.87	0.21
218	19644	90.70	88.90	271.00	10830.95	9089.85	-161.36	9089.85	0.60
219	19739	91.10	89.50	271.00	10829.46	9184.83	-160.03	9184.83	0.76
220	19833	91.10	90.30	271.00	10827.65	9278.81	-159.87	9278.81	0.85
221	19928	90.40	90.00	271.00	10826.41	9373.81	-160.12	9373.81	0.80
222	20023	90.80	90.00	273.00	10825.41	9468.80	-160.12	9468.80	0.42
223	20118	90.60	90.00	273.00	10824.25	9563.79	-160.12	9563.79	0.21
224	20212	90.10	89.40	273.00	10823.68	9657.79	-159.62	9657.79	0.83
225	20307	90.00	89.10	273.00	10823.60	9752.78	-158.38	9752.78	0.33
226	20372	89.30	88.90	273.00	10823.99	9817.77	-157.25	9817.77	1.12
Projection	20440	89.30	88.90	PTB	10824.83	9885.75	-155.94	9885.75	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 (09-2008)



Well File No.
28648

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

<input checked="" type="checkbox"/> Notice of Intent	Approximate Start Date January 2, 2015	<input type="checkbox"/> Drilling Prognosis	<input type="checkbox"/> Spill Report
<input type="checkbox"/> Report of Work Done	Date Work Completed	<input type="checkbox"/> Redrilling or Repair	<input type="checkbox"/> Shooting
<input type="checkbox"/> 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	<input type="checkbox"/> Casing or Liner	<input type="checkbox"/> Acidizing
		<input type="checkbox"/> Plug Well	<input type="checkbox"/> Fracture Treatment
		<input type="checkbox"/> Supplemental History	<input type="checkbox"/> Change Production Method
		<input type="checkbox"/> Temporarily Abandon	<input type="checkbox"/> Reclamation
		<input checked="" type="checkbox"/> Other	Name, BHL, and formation change

Well Name and Number
Chalmers 5300 21-19 9T2

Footages	Qtr-Qtr	Section	Township	Range
2259 F N L	326 F W L	LOT2	19	153 N 100 W
Field Baker	Pool Bakken		County McKenzie	

24-HOUR PRODUCTION RATE

Before	After
Oil	Bbls
Water	Bbls
Gas	MCF

Name of Contractor(s)

Address

City

State

Zip Code

DETAILS OF WORK

Oasis Petroleum respectfully requests to change the subject well as follows:

Name change: Chalmers 5300 21-19 9B (previously Chalmers 5300 21-19 9T2)

Target formation change: Bakken (previously Second Bench Three Forks)

SHL change: 2259' FNL & 327' FWL (previously 2259' FNL & 326' FWL)

Surface casing changed to 2121'

BHL changes: 2440' FNL & 250' FEL (previously 2644' FNL (2636' FSL) & 201' FEL)

Casing Point change: 2362' FNL & 790' FWL; MD: 11018' & TVD: 10749'

Bottom Hole depth change: MD: 20476'; TVD: 10815'

CC 25-00 1-5-15 KB

Revised drill plan, well summary, directional plan and plot attached.

CC 25.00

Company Oasis Petroleum North America LLC	Telephone Number 281-404-9500	
Address 1001 Fannin, Suite 1500		
City Houston	State TX	Zip Code 77002
Signature <i>VS</i>	Printed Name Victoria Siemieniewski	
Title Regulatory Specialist	Date January 2, 2015	
Email Address vsiemieniewski@oasispetroleum.com		

<input type="checkbox"/> Received	<input checked="" type="checkbox"/> Approved
Date <i>01-02-2015</i>	
By <i>David Burns</i>	
Title Engineering Tech.	

DRILLING PLAN										
OPERATOR	Oasis Petroleum	COUNTY/STATE	McKenzie Co., ND							
WELL NAME	Chalmers 5300 21-19 9B	RIG	B 22							
WELL TYPE	Horizontal Middle Bakken	LOCATION	SW NW 19-153N-100W							
EST. T.D.	20,478'	Surface Location (survey plat)	2259' FNL							
TOTAL LATERAL:	9,458'		327' FWL							
			GROUND ELEV:		2,046'	Sub Height:				
			KB ELEV:		2,071'					
MARKER		TVD	Subsea TVD	LOGS:	Type	Interval				
Pierre	NDIC MAP	2,021	50	OH Logs: Request a Sundry for an Open Hole Log Waiver: Oasis Chalmers 5300 31-19H 1,850' to 6 sec 19 153N 100W						
Greenhorn		4,824	-2,553	CBL/GR: Above top of cement/GR to base of casing						
Mowry		5,029	-2,956	MWD GR: KOP to lateral TD						
Dakota		5,417	-3,346							
Rierdon		6,463	-4,392	DEVIATION:	Surf: 3 deg. max., 1 deg / 100'; svny every 500' Prod: 5 deg. max., 1 deg / 100'; svny every 100'					
Dunham Salt		6,891	-4,820							
Dunham Salt Base		6,960	-4,889							
Pine Salt		7,257	-5,186							
Pine Salt Base		7,290	-5,219							
Oppeche Salt		7,351	-5,280							
Oppeche Salt Base		7,426	-5,355							
Amaden		7,662	-5,591							
Tyler		7,828	-5,757							
Otter/Base Minnelusa		8,032	-5,961	DSTS:	None planned					
Kibbey Lime		8,383	-6,312							
Charles Salt		8,529	-6,458	CORES:	None planned					
Base Last Salt		9,204	-7,133							
Mission Canyon		9,424	-7,353							
Lodgepole		9,988	-7,917							
False Bakken		10,709	-8,638							
Upper Bakken Shale		10,719	-8,648	MUDLOGGING:	Two-Man: Begin 200' above Kibbey 30' samples in curve and lateral					
Middle Bakken		10,735	-8,664							
Top of Target		10,745	-8,674							
Landing Target		10,751	-8,680							
Base of target		10,755	-8,684							
Lower Bakken Shale		10,777	-8,706							
				BOP:	11" 5000 psi blind. pipe & annular					
Est. Dip Rate:										
Max. Anticipated BHP:	4559	Surface Formation: Glacial till								
MUD:	Interval	Type	WT	Vis	WL	Remarks				
Surface:	0' -	FW	8.4-9.0	28-32	NC	Circ Mud Tanks				
Intermediate:	2,121' -	Invert	9.5-10.4	40-50	30+HHP	Circ Mud Tanks				
Lateral:	11,018' -	Salt Water	9.8-10.2	28-32	NC	Circ Mud Tanks				
CASING:	Size	Wt ppf	Hole	Depth	Cement	WOC	Remarks			
Surface:	13-3/8"	54#	17-1/2"	2,121'	To Surface	12	100' into Pierre			
Intermediate: (Dakota)	9-5/8"	40#	12-1/4"	6,000'	To Surface	24	Set Casing across Dakota			
Intermediate:	7"	298.32#	8-3/4"	11,018'	3917	24	1500' above Dakota			
Production Liner:	4.5"	13.5#	8"	20,476'	TOL @ 10,222'		50' above KOP			
PROBABLE PLUGS, IF REQ'D:										
OTHER:	MD	TVD	FNL/FSI	FEL/FWL	S-T-R	AZI	Build Rate: 12 Deg/100'			
Surface:	2,121	2,121	2259 FNL	327 FWL	SEC. 19 T153N R100W					
KOP:	10,272'	10,272'	2259 FNL	327 FWL	SEC. 19 T153N R100W					
EOC:	11,018'	10,749'	2362 FNL	790 FWL	SEC. 19 T153N R100W	102.5				
Casing Point:	11,018'	10,749'	2362 FNL	790 FWL	SEC. 19 T153N R100W	102.5				
Lateral TD:	20,478'	10,815'	2440 FNL	250 FEL	SEC. 20 T153N R100W	90.0				
Comments:										
Request a Sundry for an Open Hole Log Waiver: Oasis Chalmers 5300 31-19H 1,850' to 6 sec 19 153N 100W										
No frac string planned										
35 packers and 25 sleeves planned 3.6MM lbs 30% ceramic										
Oasis Petroleum does not use Diesel Fuel, as defined by the US EPA in the list below, in our hydraulic fracture operations.										
68334-30-5 (Primary Name: Fuel oil, diesel) 68476-34-6 (Primary Name: Fuel oil, diesel, No. 2) 68476-30-2 (Primary Name: Fuel oil No. 2)										
68476-31-3 (Primary Name: Fuel oil, No. 4) 8008-20-6 (Primary Name: Kerosene)										
OASIS <small>PETROLEUM</small>										
Geology: N. Gabelman	2/4/2014	Engineering: Agonzalez 1-1-15								
Revised: N. Gabelman	12/31/2014									

Oasis Petroleum
Well Summary
Chalmers 5300 21-19 9B
Section 19 T153N R100W
McKenzie County, ND

SURFACE CASING AND CEMENT DESIGN

Size	Interval	Weight	Grade	Coupling	I.D.	Drift	Make-up Torque (ft-lbs)		
							Minimum	Optimum	Max
13-3/8"	0' - 2121'	54.5	J-55	LTC	12.615	12.459	4100	5470	6840

Interval	Description	Collapse	Burst	Tension
		(psi) / a	(psi) / b	(1000 lbs) / c
0' - 2121'	13-3/8", 54.5#, J-55, LTC, 8rd	1130 / 1.13	2730 / 1.90	514 / 2.57

API Rating & Safety Factor

- a) Collapse based on full casing evacuation with 9 ppg fluid on backside (2121' setting depth).
- b) Burst pressure based on 13 ppg fluid with no fluid on backside (2121' setting depth).
- c) Based on string weight in 9 ppg fluid at 2121' TVD plus 100k# overpull. (Buoyed weight equals 100k lbs.)

Cement volumes are based on 13-3/8" casing set in 17-1/2 " hole with 60% excess to circulate cement back to surface.
Mix and pump the following slurry.

Pre-flush (Spacer): 20 bbls fresh water

Lead Slurry: 695 sks (359 bbls), 2.90 ft3/sk, 11.5 lb/gal Conventional system with 94 lb/sk cement, 4% D079 extender, 2% D053 expanding agent, 2% CaCl2 and 0.250 lb/sk D130 lost circulation control agent.

Tail Slurry: 349 sks (72 bbls), 1.16 ft3/sk 15.8 lb/gal Conventional system with 94 lb/sk cement, 0.25% CaCl2, and 0.250 lb/sk lost circulation control agent

**Oasis Petroleum
Well Summary**
Chalmers 5300 21-19 9B
Section 19 T153N R100W
McKenzie County, ND

Contingency INTERMEDIATE CASING AND CEMENT DESIGN

Size	Interval	Weight	Grade	Coupling	I.D.	Drift	Make-up Torque (ft-lbs)		
							Minimum	Optimum	Max
9-5/8"	0' - 6463'	36	J-55	LTC	8.921"	8.765"	3400	4530	5660

Interval	Description	Collapse	Burst	Tension
		(psi) / a	(psi) / b	(1000 lbs) / c
0' - 6463'	9-5/8", 36#, J-55, LTC, 8rd	2020 / 2.14	3520 / 1.28	453 / 1.53

API Rating & Safety Factor

- a) Collapse based on full casing evacuation with 10.4 ppg fluid on backside (6463' setting depth).
- b) Burst pressure calculated from a gas kick coming from the production zone (Bakken Pool) at 9,000psi and a subsequent breakdown at the 9-5/8" shoe, based on a 15.2#/ft fracture gradient. Backup of 9 ppg fluid..
- c) Tension based on string weight in 10.4 ppg fluid at 6463' TVD plus 100k# overpull. (Buoyed weight equals 196k lbs.)

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

Mix and pump the following slurry.

Pre-flush (Spacer): 20 bbls Chem wash

Lead Slurry: 565 sks (292 bbls), 2.90 ft3/sk, 11.5 lb/gal Conventional system with 94 lb/sk cement, 4% D079 extender, 2% D053 expanding agent, 2% CaCl2 and 0.250 lb/sk D130 lost circulation control agent.

Tail Slurry: 624 sks (129 bbls), 1.16 ft3/sk 15.8 lb/gal Conventional system with 94 lb/sk cement, 0.25% CaCl2, and 0.250 lb/sk lost circulation control agent

Oasis Petroleum
Well Summary
Chalmers 5300 21-19 9B
Section 19 T153N R100W
McKenzie County, ND

INTERMEDIATE CASING AND CEMENT DESIGN

Size	Interval	Weight	Grade	Coupling	I.D.	Drift**	Make-up Torque (ft-lbs)		
							Minimum	Optimum	Max
7"	0' - 6741'	29	P-110	LTC	6.184"	6.059"	5980	7970	8770
7"	6741' - 10272'	32	HCP-110	LTC	6.094"	6.000***	6730	8970	9870
7"	10272' - 11018'	29	P-110	LTC	6.184"	6.059"	5980	7970	8770

**Special Drift 7" 32# to 6.0"

Interval	Length	Description	Collapse (psi) a	Burst (psi) b	Tension (1000 lbs) c
0' - 6741'	6741'	7", 29#, P-110, LTC, 8rd	8530 / 2.43*	11220 / 1.19	797 / 2.09
6741' - 10272'	3531'	7", 32#, HCP-110, LTC, 8rd	11820 / 2.21*	12460 / 1.29	
6741' - 10272'	3531'	7", 32#, HCP-110, LTC, 8rd	11820 / 1.06**	12460 / 1.29	
10272' - 11018'	746'	7", 29#, P-110, LTC, 8rd	8530 / 1.52*	11220 / 1.16	

API Rating & Safety Factor

- a) *Assume full casing evacuation with 10 ppg fluid on backside. **Assume full casing evacuation with 1.2 psi/ft equivalent fluid gradient across salt intervals.
- b) Burst pressure based on 9000 psig max press for stimulation plus 10.2 ppg fluid in casing and 9 ppg fluid on backside-to 10749' TVD.
- c) Based on string weight in 10 ppg fluid, (280k lbs buoyed weight) plus 100k lbs overpull.

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

Mix and pump the following slurry

Pre-flush (Spacer): 100 bbls Saltwater
 20bbls CW8
 20bbls Fresh Water

Lead Slurry: 219 sks (86 bbls), 11.8 lb/gal, 2.59 ft³/sk yield, Conventional system with 61 lb/sk cement, 10% NaCl, 23 lb/sk extender, 0.2% D046 Anti Foam, 0.25lb/sk D130 Lost Circulation, 0.8% D112 Fluid Loss, 6% D035 Extender.

Tail Slurry: 600 sks (165 bbls), 15.8 lb/gal, 1.55 ft³/sk yield, Conventional system with 94 lb/sk cement, 10% NaCl, 35% Silica, 0.2% fluid loss agent D167, 0.27% Retarder D198, 0.25 lb/sk D130 lost circulation control, 0.2% Anti Foam D046.

Oasis Petroleum
Well Summary
Chalmers 5300 21-19 9B
Section 19 T153N R100W
McKenzie County, ND

PRODUCTION LINER

Size	Interval	Weight	Grade	Coupling	I.D.	Drift	Make-up Torque (ft-lbs)		
							Minimum	Optimum	Max
4-1/2"	10222' - 20476'	11.6	P-110	BTC	4.000"	3.875"	2270	3020	3780

Interval	Length	Description	Collapse (psi) a	Burst (psi) b	Tension (1000 lbs) c
10222' - 20476'	10254	4-1/2", 11.6 lb, P-110, BTC	7560 / 1.41	10690 / 1.10	385 / 1.90

API Rating & Safety Factor

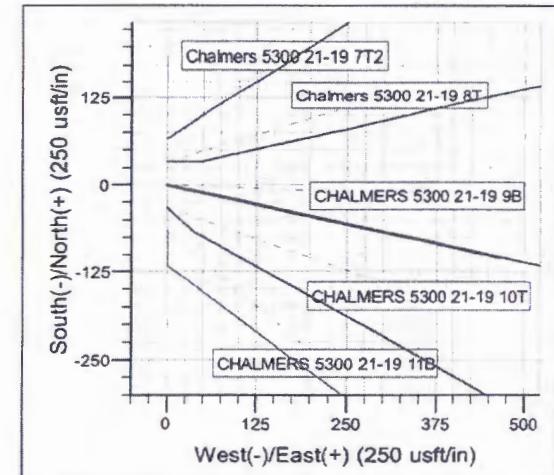
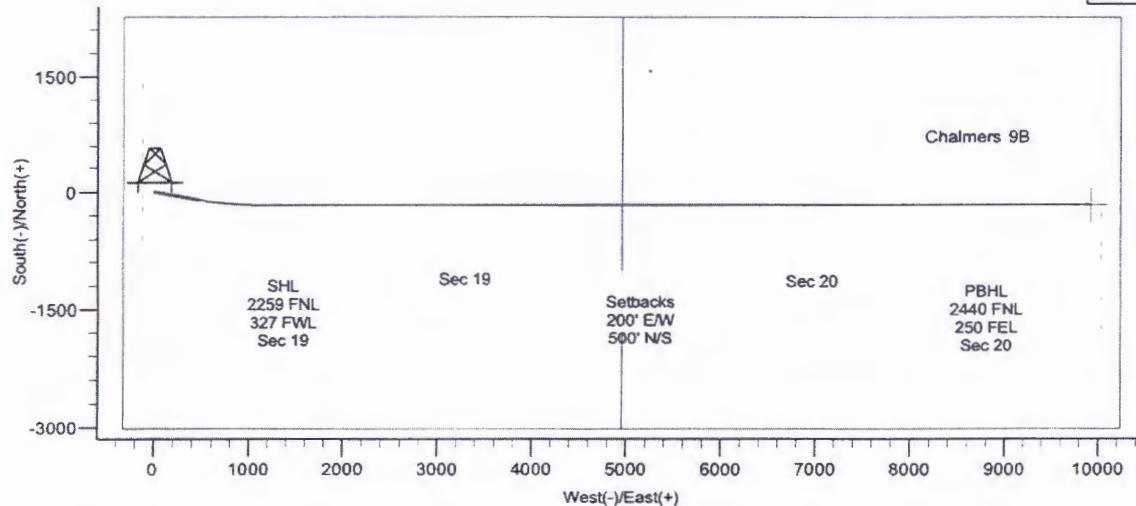
- a) Based on full casing evacuation with 9.5 ppg fluid on backside @ 10815' TVD.
- b) Burst pressure based on 9000 psi treating pressure with 10.2 ppg internal fluid gradient and 9 ppg external fluid gradient @ 10815' TVD.
- c) Based on string weight in 9.5 ppg fluid (Buoyed weight: 102k lbs.) plus 100k lbs overpull.

Project: Indian Hills
 Site: 153N-100W-19/20
 Well: CHALMERS 5300 21-19 9B
 Wellbore: CHALMERS 5300 21-19 9B
 Design: Plan #1



WELL DETAILS: CHALMERS 5300 21-19 9B

Northing	402440.51	Ground Level:	2046.0
Easting	1209984.57	Latitude	48° 3' 40.970 N
		Longitude	103° 36' 10.110 W



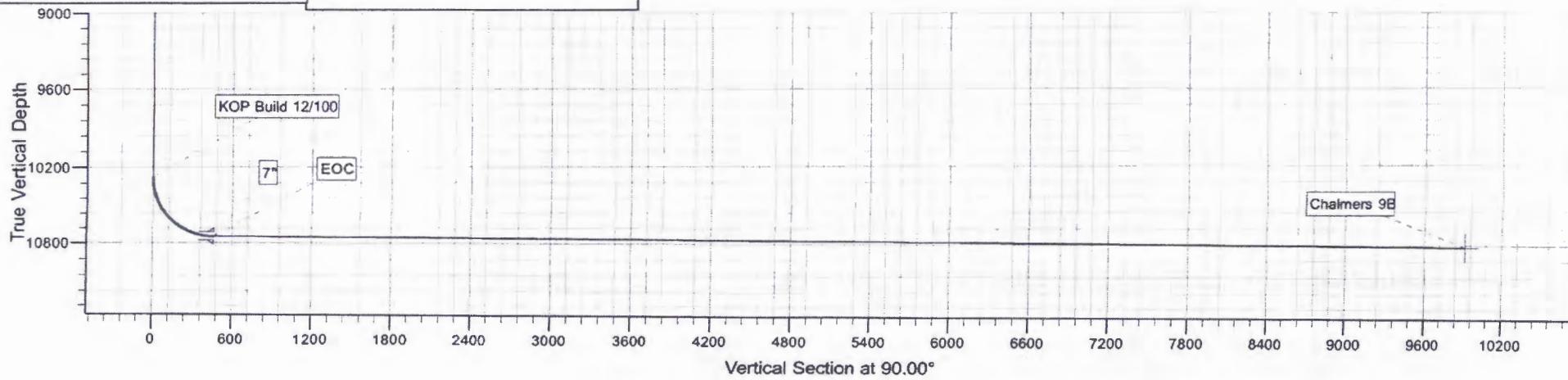
CASING DETAILS			
TVD	MD	Name	Size
2121.0	2121.0	13 3/8"	13.375
6463.0	6463.0	9 5/8"	9.625
10749.0	11018.2	7"	7.000



Azimuths to True North
Magnetic North: 8.31

Magnetic Field
Strength: 56462.1snT
Dip Angle: 73.00°
Date: 2/17/2014
Model: IGRF2010

SECTION DETAILS							
MD	Inc	Azi	TVD	+N-S	+E-W	Dleg	Target
0.0	0.00	0.00	0.0	0.0	0.0	0.00	
10271.5	0.00	0.00	10271.5	0.0	0.0	0.00	
11018.2	89.60	102.50	10749.0	-102.6	462.9	12.00	
11643.0	89.60	90.00	10753.3	-170.5	1082.8	2.00	
20476.4	89.60	90.00	10815.0	-171.0	9916.0	0.00	Chalmers 9B



Oasis

Indian Hills

153N-100W-19/20

CHALMERS 5300 21-19 9B

T153N R100W SECTION 19

CHALMERS 5300 21-19 9B

Plan: Plan #1

Standard Planning Report

01 January, 2015

Planning Report

Database:	OpenWellsCompass - EDM Prod	Local Co-ordinate Reference:	Well CHALMERS 5300 21-19 9B
Company:	Oasis	TVD Reference:	WELL @ 2071.0usft (Original Well Elev)
Project:	Indian Hills	MD Reference:	WELL @ 2071.0usft (Original Well Elev)
Site:	153N-100W-19/20	North Reference:	True
Well:	CHALMERS 5300 21-19 9B	Survey Calculation Method:	Minimum Curvature
Wellbore:	CHALMERS 5300 21-19 9B		
Design:	Plan #1		

Project	Indian Hills
Map System:	US State Plane 1983
Geo Datum:	North American Datum 1983
Map Zone:	North Dakota Northern Zone

Site	153N-100W-19/20
Site Position:	Northing: 402,776.24 usft
From:	Easting: 1,209,958.00 usft
Position Uncertainty:	Slot Radius: 13.200 in Grid Convergence: -2.31 °

Well	CHALMERS 5300 21-19 9B
Well Position	+N/S -334.4 usft Northing: 402,440.51 usft Latitude: 48° 3' 40.970 N
	+E/W 40.1 usft Easting: 1,209,984.57 usft Longitude: 103° 36' 10.700 W
Position Uncertainty	2.0 usft Wellhead Elevation: Ground Level: 2,046.0 usft

Wellbore	CHALMERS 5300 21-19 9B
Magnetics	Model Name Sample Date Declination Dip Angle Field Strength IGRF2010 2/17/2014 8.31 73.00 (nT) 56,462

Design	Plan #1
Audit Notes:	
Version:	Phase: PROTOTYPE Tie On Depth: 0.0
Vertical Section:	Depth From (TVD) (usft) +N/S (usft) +E/W (usft) Direction (°) 0.0 0.0 0.0 90.00

Plan Sections										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/S (usft)	+E/W (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	TFO (°)	Target
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00
10,271.5	0.00	0.00	10,271.5	0.0	0.0	0.00	0.00	0.00	0.00	0.00
11,018.2	89.60	102.50	10,749.0	-102.6	462.9	12.00	12.00	0.00	102.50	
11,643.0	89.60	90.00	10,753.3	-170.5	1,082.8	2.00	0.00	-2.00	-90.04	
20,476.4	89.60	90.00	10,815.0	-171.0	9,916.0	0.00	0.00	0.00	0.00	Chalmers 9B

Planning Report

Database:	OpenWellsCompass - EDM Prod	Local Co-ordinate Reference:	Well CHALMERS 5300 21-19 9B
Company:	Oasis	TVD Reference:	WELL @ 2071.0usft (Original Well Elev)
Project:	Indian Hills	MD Reference:	WELL @ 2071.0usft (Original Well Elev)
Site:	153N-100W-19/20	North Reference:	True
Well:	CHALMERS 5300 21-19 9B	Survey Calculation Method:	Minimum Curvature
Wellbore:	CHALMERS 5300 21-19 9B		
Design:	Plan #1		

Planned Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N-S (usft)	+E-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	
10,271.5	0.00	0.00	10,271.5	0.0	0.0	0.0	0.00	0.00	0.00	
KOP Build 12/100										
10,275.0	0.42	102.50	10,275.0	0.0	0.0	0.0	12.00	12.00	0.00	
10,300.0	3.42	102.50	10,300.0	-0.2	0.8	0.8	12.00	12.00	0.00	
10,325.0	6.42	102.50	10,324.9	-0.6	2.9	2.9	12.00	12.00	0.00	
10,350.0	9.42	102.50	10,349.6	-1.4	6.3	6.3	12.00	12.00	0.00	
10,375.0	12.42	102.50	10,374.2	-2.4	10.9	10.9	12.00	12.00	0.00	
10,400.0	15.42	102.50	10,398.5	-3.7	16.8	16.8	12.00	12.00	0.00	
10,425.0	18.42	102.50	10,422.4	-5.3	23.9	23.9	12.00	12.00	0.00	
10,450.0	21.42	102.50	10,445.9	-7.1	32.2	32.2	12.00	12.00	0.00	
10,475.0	24.42	102.50	10,468.9	-9.2	41.7	41.7	12.00	12.00	0.00	
10,500.0	27.42	102.50	10,491.4	-11.6	52.4	52.4	12.00	12.00	0.00	
10,525.0	30.42	102.50	10,513.3	-14.2	64.2	64.2	12.00	12.00	0.00	
10,550.0	33.42	102.50	10,534.5	-17.1	77.1	77.1	12.00	12.00	0.00	
10,575.0	36.42	102.50	10,555.0	-20.2	91.0	91.0	12.00	12.00	0.00	
10,600.0	39.42	102.50	10,574.7	-23.5	106.0	106.0	12.00	12.00	0.00	
10,625.0	42.42	102.50	10,593.6	-27.1	122.0	122.0	12.00	12.00	0.00	
10,650.0	45.42	102.50	10,611.6	-30.8	139.0	139.0	12.00	12.00	0.00	
10,675.0	48.42	102.50	10,628.7	-34.8	156.8	156.8	12.00	12.00	0.00	
10,700.0	51.42	102.50	10,644.8	-38.9	175.5	175.5	12.00	12.00	0.00	
10,725.0	54.42	102.50	10,659.8	-43.2	194.9	194.9	12.00	12.00	0.00	
10,750.0	57.42	102.50	10,673.8	-47.7	215.1	215.1	12.00	12.00	0.00	
10,775.0	60.42	102.50	10,686.7	-52.3	236.0	236.0	12.00	12.00	0.00	
10,800.0	63.42	102.50	10,698.5	-57.1	257.6	257.6	12.00	12.00	0.00	
10,825.0	66.42	102.50	10,709.1	-62.0	279.7	279.7	12.00	12.00	0.00	
10,850.0	69.42	102.50	10,718.5	-67.0	302.3	302.3	12.00	12.00	0.00	
10,875.0	72.42	102.50	10,728.7	-72.1	325.4	325.4	12.00	12.00	0.00	
10,900.0	75.42	102.50	10,733.6	-77.3	348.8	348.8	12.00	12.00	0.00	
10,925.0	78.42	102.50	10,739.2	-82.6	372.6	372.6	12.00	12.00	0.00	
10,950.0	81.42	102.50	10,743.6	-87.9	396.6	396.6	12.00	12.00	0.00	
10,975.0	84.42	102.50	10,746.7	-93.3	420.8	420.8	12.00	12.00	0.00	
11,000.0	87.42	102.50	10,748.5	-98.7	445.2	445.2	12.00	12.00	0.00	
11,018.2	89.60	102.50	10,749.0	-102.6	462.9	462.9	11.98	11.98	0.00	
EOC - T"										
11,100.0	89.60	100.86	10,749.5	-119.2	543.0	543.0	2.00	0.00	-2.00	
11,200.0	89.60	98.86	10,750.2	-136.3	641.5	641.5	2.00	0.00	-2.00	
11,300.0	89.60	96.86	10,750.9	-150.0	740.6	740.6	2.00	0.00	-2.00	
11,400.0	89.60	94.86	10,751.8	-160.2	840.1	840.1	2.00	0.00	-2.00	
11,500.0	89.60	92.86	10,752.3	-166.9	939.8	939.8	2.00	0.00	-2.00	
11,600.0	89.60	90.86	10,753.0	-170.2	1,039.8	1,039.8	2.00	0.00	-2.00	
11,643.0	89.60	90.00	10,753.3	-170.5	1,082.8	1,062.6	2.00	0.00	-2.00	
11,700.0	89.60	90.00	10,753.7	-170.5	1,139.8	1,139.8	0.00	0.00	0.00	
11,800.0	89.80	90.00	10,754.4	-170.5	1,239.8	1,239.8	0.00	0.00	0.00	
11,900.0	89.60	90.00	10,755.1	-170.5	1,339.8	1,339.8	0.00	0.00	0.00	
12,000.0	89.60	90.00	10,755.8	-170.5	1,439.8	1,439.8	0.00	0.00	0.00	
12,100.0	89.60	90.00	10,756.5	-170.5	1,539.8	1,539.8	0.00	0.00	0.00	
12,200.0	89.60	90.00	10,757.2	-170.6	1,639.6	1,639.8	0.00	0.00	0.00	
12,300.0	89.60	90.00	10,757.9	-170.6	1,739.7	1,739.7	0.00	0.00	0.00	
12,400.0	89.60	90.00	10,758.6	-170.6	1,839.7	1,839.7	0.00	0.00	0.00	
12,500.0	89.60	90.00	10,759.3	-170.6	1,939.7	1,839.7	0.00	0.00	0.00	
12,600.0	89.60	90.00	10,760.0	-170.6	2,039.7	2,039.7	0.00	0.00	0.00	
12,700.0	89.60	90.00	10,760.7	-170.6	2,139.7	2,139.7	0.00	0.00	0.00	
12,800.0	89.60	90.00	10,761.4	-170.6	2,239.7	2,239.7	0.00	0.00	0.00	
12,900.0	89.60	90.00	10,762.1	-170.6	2,339.7	2,339.7	0.00	0.00	0.00	
13,000.0	89.60	90.00	10,762.8	-170.6	2,439.7	2,439.7	0.00	0.00	0.00	

Planning Report

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Project:	Indian Hills	MD Reference:	WELL @ 2071.0usft (Original Well Elev)
Site:	153N-100W-19/20	North Reference:	True
Well:	CHALMERS 5300 21-19 9B	Survey Calculation Method:	Minimum Curvature
Wellbore:	CHALMERS 5300 21-19 9B		
Design:	Plan #1		

Planned Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N-S (usft)	+E-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	
13,100.0	89.60	90.00	10,763.5	-170.6	2,539.7	2,539.7	0.00	0.00	0.00	
13,200.0	89.60	90.00	10,764.2	-170.6	2,839.7	2,639.7	0.00	0.00	0.00	
13,300.0	89.60	90.00	10,764.9	-170.6	2,739.7	2,739.7	0.00	0.00	0.00	
13,400.0	89.60	90.00	10,765.6	-170.6	2,839.7	2,839.7	0.00	0.00	0.00	
13,500.0	89.60	90.00	10,766.3	-170.6	2,939.7	2,939.7	0.00	0.00	0.00	
13,600.0	89.60	90.00	10,767.0	-170.6	3,039.7	3,039.7	0.00	0.00	0.00	
13,700.0	89.60	90.00	10,767.7	-170.6	3,139.7	3,139.7	0.00	0.00	0.00	
13,800.0	89.60	90.00	10,768.4	-170.6	3,239.7	3,239.7	0.00	0.00	0.00	
13,900.0	89.60	90.00	10,769.1	-170.6	3,339.7	3,339.7	0.00	0.00	0.00	
14,000.0	89.60	90.00	10,769.8	-170.7	3,439.7	3,439.7	0.00	0.00	0.00	
14,100.0	89.60	90.00	10,770.5	-170.7	3,539.7	3,539.7	0.00	0.00	0.00	
14,200.0	89.60	90.00	10,771.2	-170.7	3,639.7	3,639.7	0.00	0.00	0.00	
14,300.0	89.60	90.00	10,771.9	-170.7	3,739.7	3,739.7	0.00	0.00	0.00	
14,400.0	89.60	90.00	10,772.6	-170.7	3,839.7	3,839.7	0.00	0.00	0.00	
14,500.0	89.60	90.00	10,773.3	-170.7	3,939.7	3,939.7	0.00	0.00	0.00	
14,600.0	89.60	90.00	10,774.0	-170.7	4,039.7	4,039.7	0.00	0.00	0.00	
14,700.0	89.60	90.00	10,774.7	-170.7	4,139.7	4,139.7	0.00	0.00	0.00	
14,800.0	89.60	90.00	10,775.4	-170.7	4,239.7	4,239.7	0.00	0.00	0.00	
14,900.0	89.60	90.00	10,776.1	-170.7	4,339.7	4,339.7	0.00	0.00	0.00	
15,000.0	89.60	90.00	10,776.8	-170.7	4,439.7	4,439.7	0.00	0.00	0.00	
15,100.0	89.60	90.00	10,777.5	-170.7	4,539.7	4,539.7	0.00	0.00	0.00	
15,200.0	89.60	90.00	10,778.2	-170.7	4,639.7	4,639.7	0.00	0.00	0.00	
15,300.0	89.60	90.00	10,778.9	-170.7	4,739.7	4,739.7	0.00	0.00	0.00	
15,400.0	89.60	90.00	10,779.6	-170.7	4,839.7	4,839.7	0.00	0.00	0.00	
15,500.0	89.60	90.00	10,780.3	-170.7	4,939.7	4,939.7	0.00	0.00	0.00	
15,600.0	89.60	90.00	10,781.0	-170.7	5,039.7	5,039.7	0.00	0.00	0.00	
15,700.0	89.60	90.00	10,781.7	-170.7	5,139.7	5,139.7	0.00	0.00	0.00	
15,800.0	89.60	90.00	10,782.4	-170.7	5,239.7	5,239.7	0.00	0.00	0.00	
15,900.0	89.60	90.00	10,783.1	-170.8	5,339.7	5,339.7	0.00	0.00	0.00	
16,000.0	89.60	90.00	10,783.7	-170.8	5,439.7	5,439.7	0.00	0.00	0.00	
16,100.0	89.60	90.00	10,784.4	-170.8	5,539.7	5,539.7	0.00	0.00	0.00	
16,200.0	89.60	90.00	10,785.1	-170.8	5,639.7	5,639.7	0.00	0.00	0.00	
16,300.0	89.60	90.00	10,785.8	-170.8	5,739.7	5,739.7	0.00	0.00	0.00	
16,400.0	89.60	90.00	10,786.5	-170.8	5,839.6	5,839.6	0.00	0.00	0.00	
16,500.0	89.60	90.00	10,787.2	-170.8	5,939.6	5,939.6	0.00	0.00	0.00	
16,600.0	89.60	90.00	10,787.9	-170.8	6,039.6	6,039.6	0.00	0.00	0.00	
16,700.0	89.60	90.00	10,788.6	-170.8	6,139.6	6,139.6	0.00	0.00	0.00	
16,800.0	89.60	90.00	10,789.3	-170.8	6,239.6	6,239.6	0.00	0.00	0.00	
16,900.0	89.60	90.00	10,790.0	-170.8	6,339.6	6,339.6	0.00	0.00	0.00	
17,000.0	89.60	90.00	10,790.7	-170.8	6,439.6	6,439.6	0.00	0.00	0.00	
17,100.0	89.60	90.00	10,791.4	-170.8	6,539.6	6,539.6	0.00	0.00	0.00	
17,200.0	89.60	90.00	10,792.1	-170.8	6,639.6	6,639.6	0.00	0.00	0.00	
17,300.0	89.60	90.00	10,792.8	-170.8	6,739.6	6,739.6	0.00	0.00	0.00	
17,400.0	89.60	90.00	10,793.5	-170.8	6,839.6	6,839.6	0.00	0.00	0.00	
17,500.0	89.60	90.00	10,794.2	-170.8	6,939.6	6,939.6	0.00	0.00	0.00	
17,600.0	89.60	90.00	10,794.9	-170.8	7,039.6	7,039.6	0.00	0.00	0.00	
17,700.0	89.60	90.00	10,795.6	-170.9	7,139.6	7,139.6	0.00	0.00	0.00	
17,800.0	89.60	90.00	10,796.3	-170.9	7,239.6	7,239.6	0.00	0.00	0.00	
17,900.0	89.60	90.00	10,797.0	-170.9	7,339.6	7,339.6	0.00	0.00	0.00	
18,000.0	89.60	90.00	10,797.7	-170.9	7,439.6	7,439.6	0.00	0.00	0.00	
18,100.0	89.60	90.00	10,798.4	-170.9	7,539.6	7,539.6	0.00	0.00	0.00	
18,200.0	89.60	90.00	10,799.1	-170.9	7,639.6	7,639.6	0.00	0.00	0.00	
18,300.0	89.60	90.00	10,799.8	-170.9	7,739.6	7,739.6	0.00	0.00	0.00	
18,400.0	89.60	90.00	10,800.5	-170.9	7,839.6	7,839.6	0.00	0.00	0.00	
18,500.0	89.60	90.00	10,801.2	-170.9	7,939.6	7,939.6	0.00	0.00	0.00	

Planning Report

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Company:	Oasis	TVD Reference:	WELL @ 2071.0usft (Original Well Elev)
Project:	Indian Hills	MD Reference:	WELL @ 2071.0usft (Original Well Elev)
Site:	153N-100W-19/20	North Reference:	True
Well:	CHALMERS 5300 21-19 9B	Survey Calculation Method:	Minimum Curvature
Wellbore:	CHALMERS 5300 21-19 9B		
Design:	Plan #1		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/S (usft)	+E/W (usft)	Vertical Section (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
18,600.0	89.60	90.00	10,801.9	-170.9	8,039.6	8,039.6	0.00	0.00	0.00
18,700.0	89.60	90.00	10,802.6	-170.9	8,139.6	8,139.6	0.00	0.00	0.00
18,800.0	89.60	90.00	10,803.3	-170.9	8,239.6	8,239.6	0.00	0.00	0.00
18,900.0	89.60	90.00	10,804.0	-170.9	8,339.6	8,339.6	0.00	0.00	0.00
19,000.0	89.60	90.00	10,804.7	-170.9	8,439.6	8,439.6	0.00	0.00	0.00
19,100.0	89.60	90.00	10,805.4	-170.9	8,539.6	8,539.6	0.00	0.00	0.00
19,200.0	89.60	90.00	10,806.1	-170.9	8,639.6	8,639.6	0.00	0.00	0.00
19,300.0	89.60	90.00	10,806.8	-170.9	8,739.6	8,739.6	0.00	0.00	0.00
19,400.0	89.60	90.00	10,807.5	-170.9	8,839.6	8,839.6	0.00	0.00	0.00
19,500.0	89.60	90.00	10,808.2	-170.9	8,939.6	8,939.6	0.00	0.00	0.00
19,600.0	89.60	90.00	10,808.9	-171.0	9,039.6	9,039.6	0.00	0.00	0.00
19,700.0	89.60	90.00	10,809.6	-171.0	9,139.6	9,139.6	0.00	0.00	0.00
19,800.0	89.60	90.00	10,810.3	-171.0	9,239.6	9,239.6	0.00	0.00	0.00
19,900.0	89.60	90.00	10,811.0	-171.0	9,339.6	9,339.6	0.00	0.00	0.00
20,000.0	89.60	90.00	10,811.7	-171.0	9,439.6	9,439.6	0.00	0.00	0.00
20,100.0	89.60	90.00	10,812.4	-171.0	9,539.6	9,539.6	0.00	0.00	0.00
20,200.0	89.60	90.00	10,813.1	-171.0	9,639.6	9,639.6	0.00	0.00	0.00
20,300.0	89.60	90.00	10,813.8	-171.0	9,739.6	9,739.6	0.00	0.00	0.00
20,400.0	89.60	90.00	10,814.5	-171.0	9,839.6	9,839.6	0.00	0.00	0.00
20,476.4	89.60	90.00	10,815.0	-171.0	9,916.0	9,916.0	0.00	0.00	0.00

Chalmers 9B

Design Targets									
Target Name	Dip Angle (°)	Dip Dir.	TVD (usft)	+N/S (usft)	+E/W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
Chalmers 9B - hit/miss target - Shape - plan hits target center - Point	0.00	0.00	10,815.0	-171.0	9,916.0	401,870.16	1,219,885.63	48° 3' 39.257 N	103° 33' 44.125 W

Casing Points									
Measured Depth (usft)	Vertical Depth (usft)	Name				Casing Diameter (in)	Hole Diameter (in)		
2,121.0	2,121.0	13 3/8"				13.375	17.500		
6,463.0	6,463.0	9 5/8"				9.625	12.250		
11,018.2	10,749.0	7"				7.000	8.750		

Planning Report

Database:	OpenWellsCompass - EDM Prod	Local Co-ordinate Reference:	Well CHALMERS 5300 21-19 9B
Company:	Oasis	TVD Reference:	WELL @ 2071.0usft (Original Well Elev)
Project:	Indian Hills	MD Reference:	WELL @ 2071.0usft (Original Well Elev)
Site:	153N-100W-19/20	North Reference:	True
Well:	CHALMERS 5300 21-19 9B	Survey Calculation Method:	Minimum Curvature
Wellbore:	CHALMERS 5300 21-19 9B		
Design:	Plan #1		

Formations	Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
	2,021.0	2,021.0	Pierre			
	4,624.0	4,624.0	Greenhorn			
	5,029.0	5,029.0	Mowry			
	5,417.0	5,417.0	Dakota			
	6,463.0	6,463.0	Rierdon			
	6,891.0	6,891.0	Dunham Salt			
	6,960.0	6,960.0	Dunham Salt Base			
	7,257.0	7,257.0	Pine Salt			
	7,290.0	7,290.0	Pine Salt Base			
	7,351.0	7,351.0	Opeche Salt			
	7,426.0	7,426.0	Opeche Salt Base			
	7,662.0	7,662.0	Amsden			
	7,828.0	7,828.0	Tyler			
	8,032.0	8,032.0	Otter/Base Minnelusa			
	8,384.0	8,384.0	Kibbey Lime			
	8,534.0	8,534.0	Charles Salt			
	9,209.0	9,209.0	Base Last Salt			
	9,429.0	9,429.0	Mission Canyon			
	9,993.0	9,993.0	Lodgepole			
	10,817.4	10,706.0	False Bakken			
	10,843.0	10,716.0	Upper Bakken Shale			
	10,946.0	10,743.0	Middle Bakken (Top of Target)			
	11,738.7	10,754.0	Middle Bakken (Base of target)			
	13,457.6	10,766.0	Lower Bakken Shale			
	18,184.6	10,799.0	Threeforks			

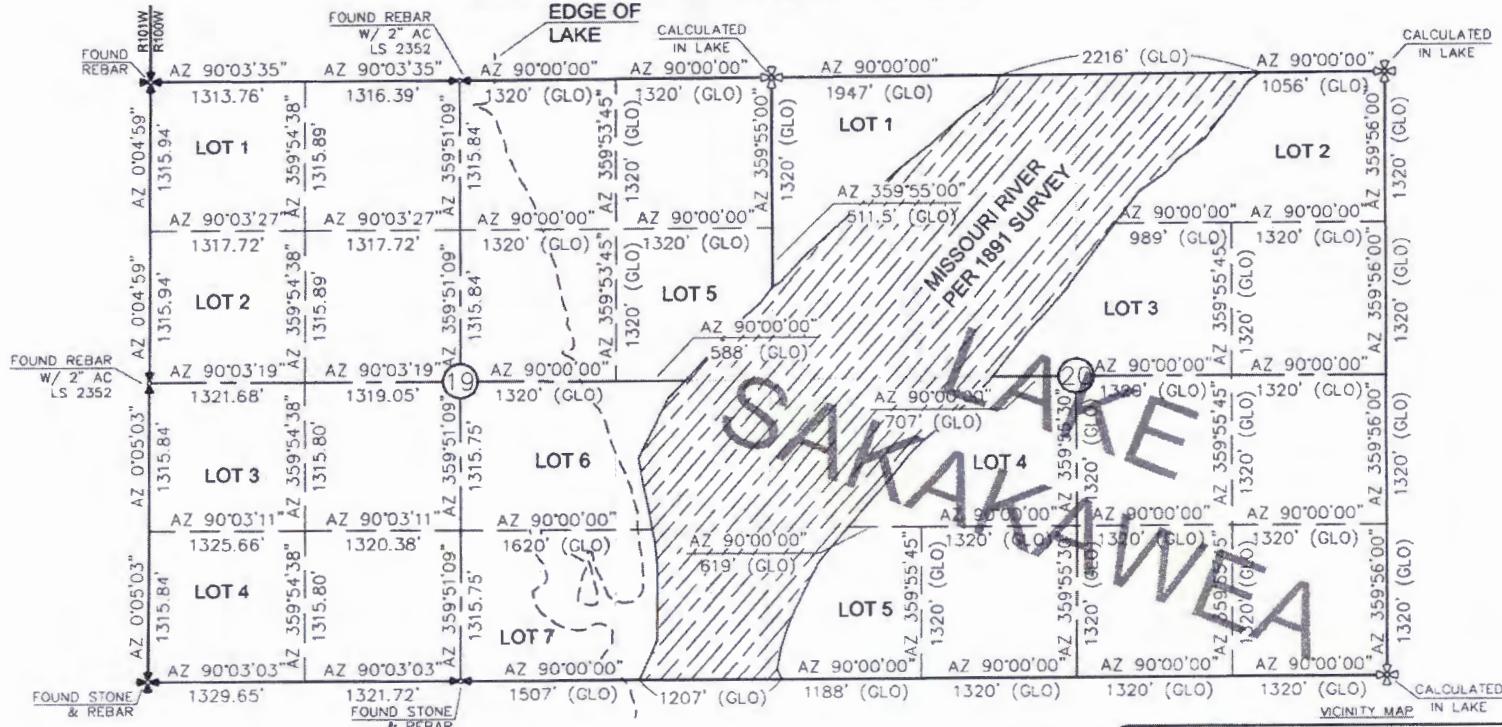
Plan Annotations	Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		
			+N/S (usft)	+E/W (usft)	Comment
	10,271.5	10,271.5	0.0	0.0	KOP Build 12/100
	11,018.2	10,749.0	-102.6	462.9	EOC

SECTION BREAKDOWN

OASIS PETROLEUM NORTH AMERICA, LLC
1001 FANNIN, SUITE 1500, HOUSTON, TX 77002

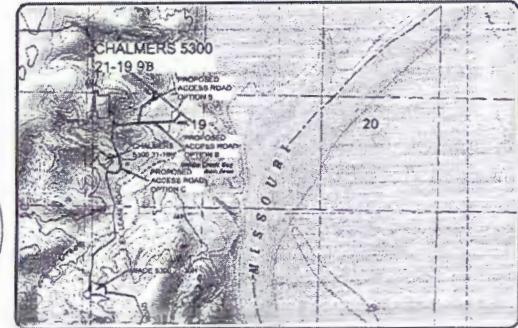
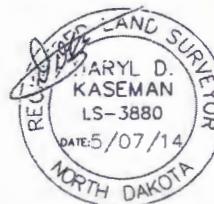
"CHALMERS 5300 21-19 9B

2259 FEET FROM NORTH LINE AND 327 FEET FROM WEST LINE
SECTIONS 19 & 20, T153N, R100W, 5th P.M., MCKENZIE COUNTY, NORTH DAKOTA



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PLS. REGISTRATION NUMBER 3880 ON
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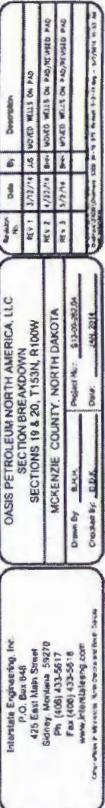
ALL AZIMUTHS ARE BASED ON G.P.S.
OBSERVATIONS. THE ORIGINAL SURVEY OF THIS
AREA FOR THE GENERAL LAND OFFICE (G.L.O.)
WAS 1891. THE CORNERS FOUND ARE AS
INDICATED AND ALL OTHERS ARE COMPUTED FROM
THOSE CORNERS FOUND AND BASED ON G.L.O.
DATA. THE MAPPING ANGLE FOR THIS AREA IS
APPROXIMATELY -003.



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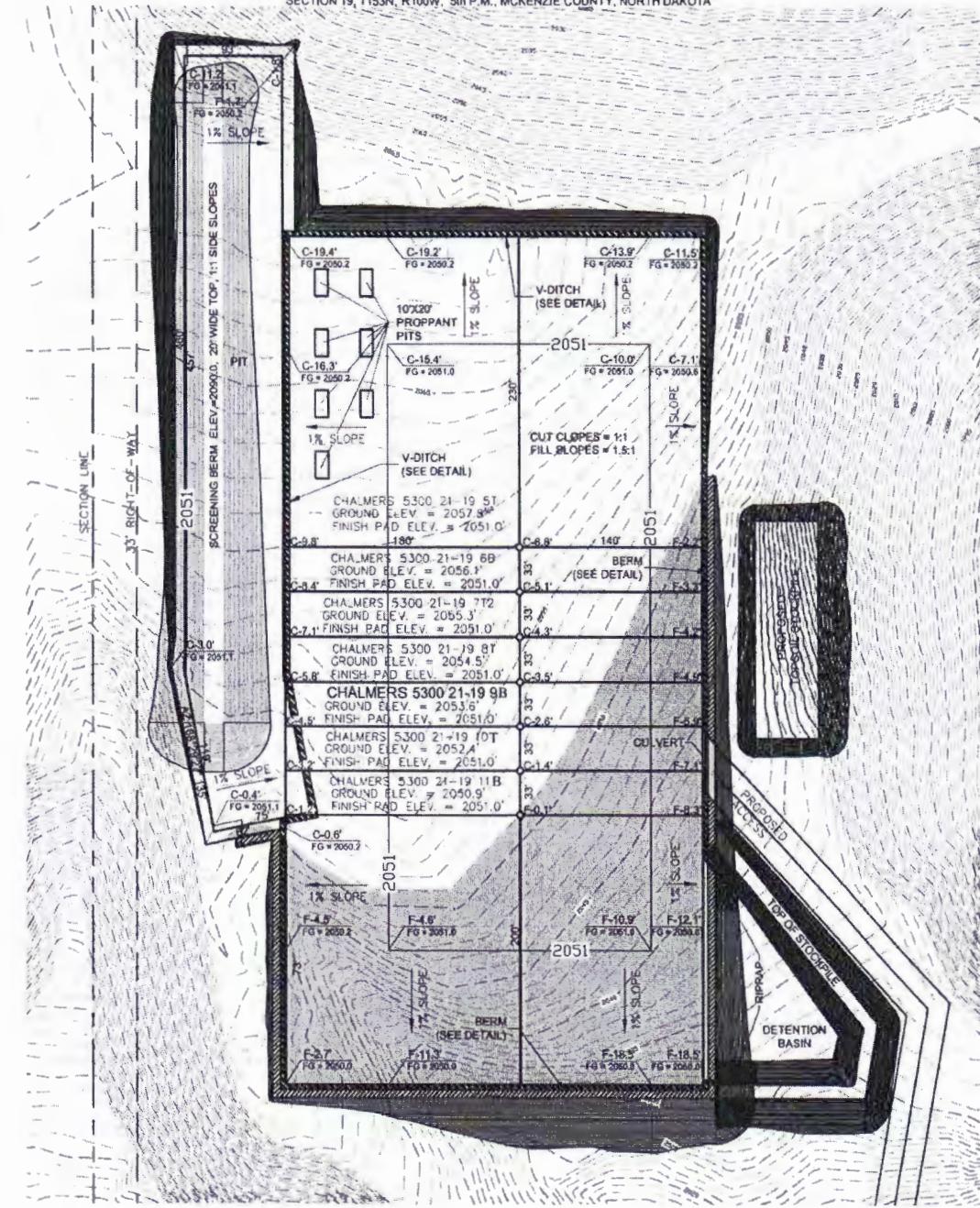


PAD LAYOUT

OASIS PETROLEUM NORTH AMERICA, LLC
1001 FANNIN, SUITE 1500, HOUSTON, TX 77002

*CHALMERS 5300 21-19 9B

2259 FEET FROM NORTH LINE AND 327 FEET FROM WEST LINE
SECTION 19, T153N, R100W, 5th P.M., MCKENZIE COUNTY, NORTH DAKOTA



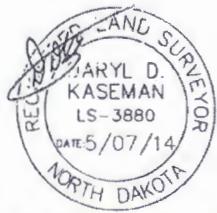
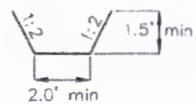
NOTE 1: Pad dimensions shown are to usable area, the v-ditch and berm areas shall be built to the outside of the pad dimensions.

NOTE 2: Screening berm is to be built after drilling operations are complete.

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V-DITCH DETAIL



Proposed Contours - BERM
Original Contours - DITCH

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

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Operational in Montana, North Dakota and South Dakota

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

Drawn By: B.J.H. Project No.: B13-09-292-04
Checked By: D.D.K. Date: JAN 2014

Revision No.	Date	No.	Description
REV 1	5/12/14	1/2	WORED NELLS ON PAD
REV 2	5/22/14	1/2	WORED NELLS ON PAD/REVISED PAD
REV 3	5/27/14	1/2	WORED NELLS ON PAD/REVISED PAD

Submittal of Changes 5300 21-19 9B Revised 5/12/14 by D.D.K. on 5/22/14

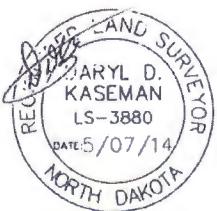
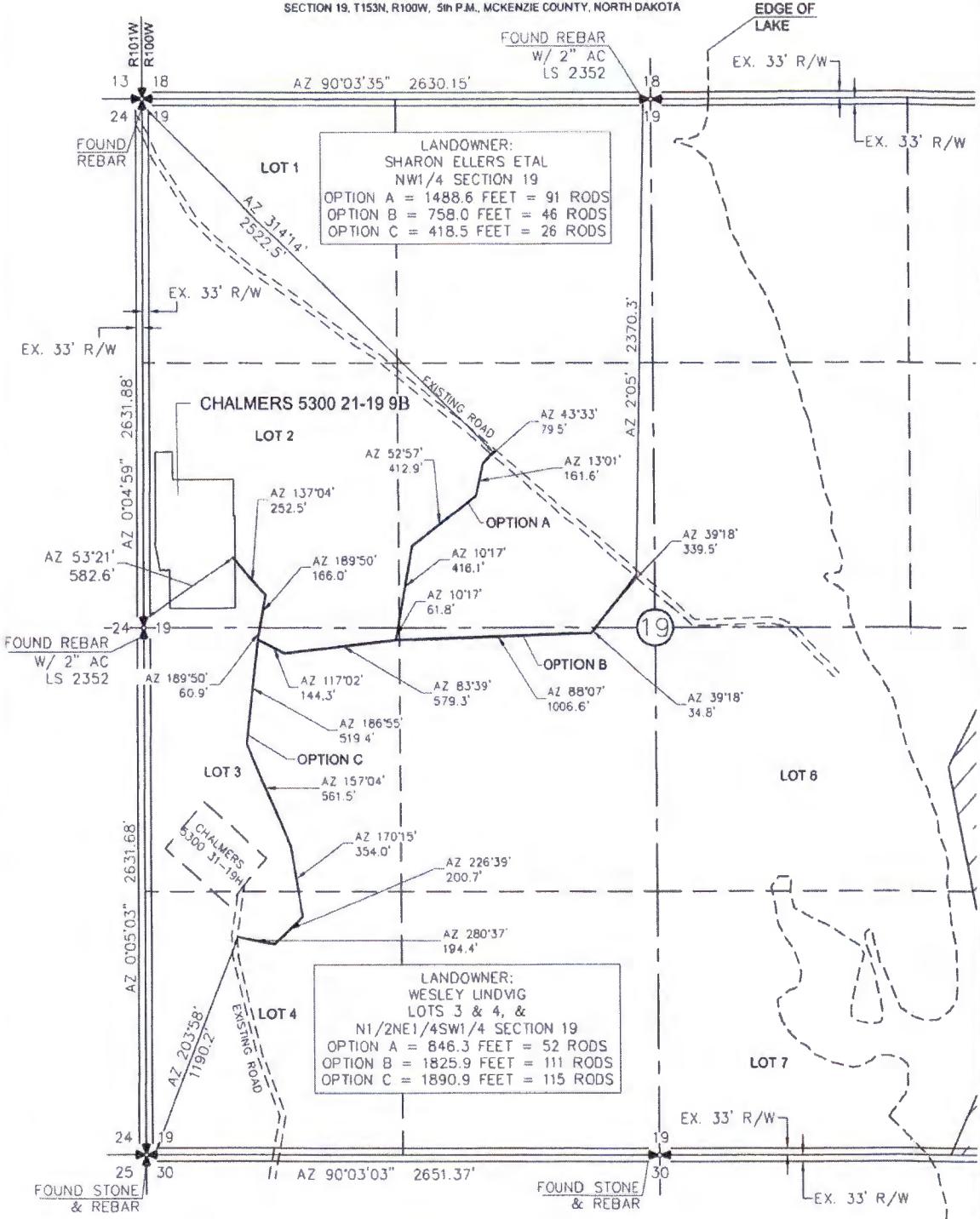
ACCESS APPROACH

OASIS PETROLEUM NORTH AMERICA, LLC

1001 FANNIN, SUITE 1500, HOUSTON, TX 77002
1-800-547-2222, 713-656-2115, FAX

*CHALMERS 5300 21-19 9B
11 NORTH LINE AND 227 FEET

2259 FEET FROM NORTH LINE AND 327 FEET FROM WEST LINE
SECTION 19, T153N, R100W, 5th P.M., MCKENZIE COUNTY, NORTH DAKOTA

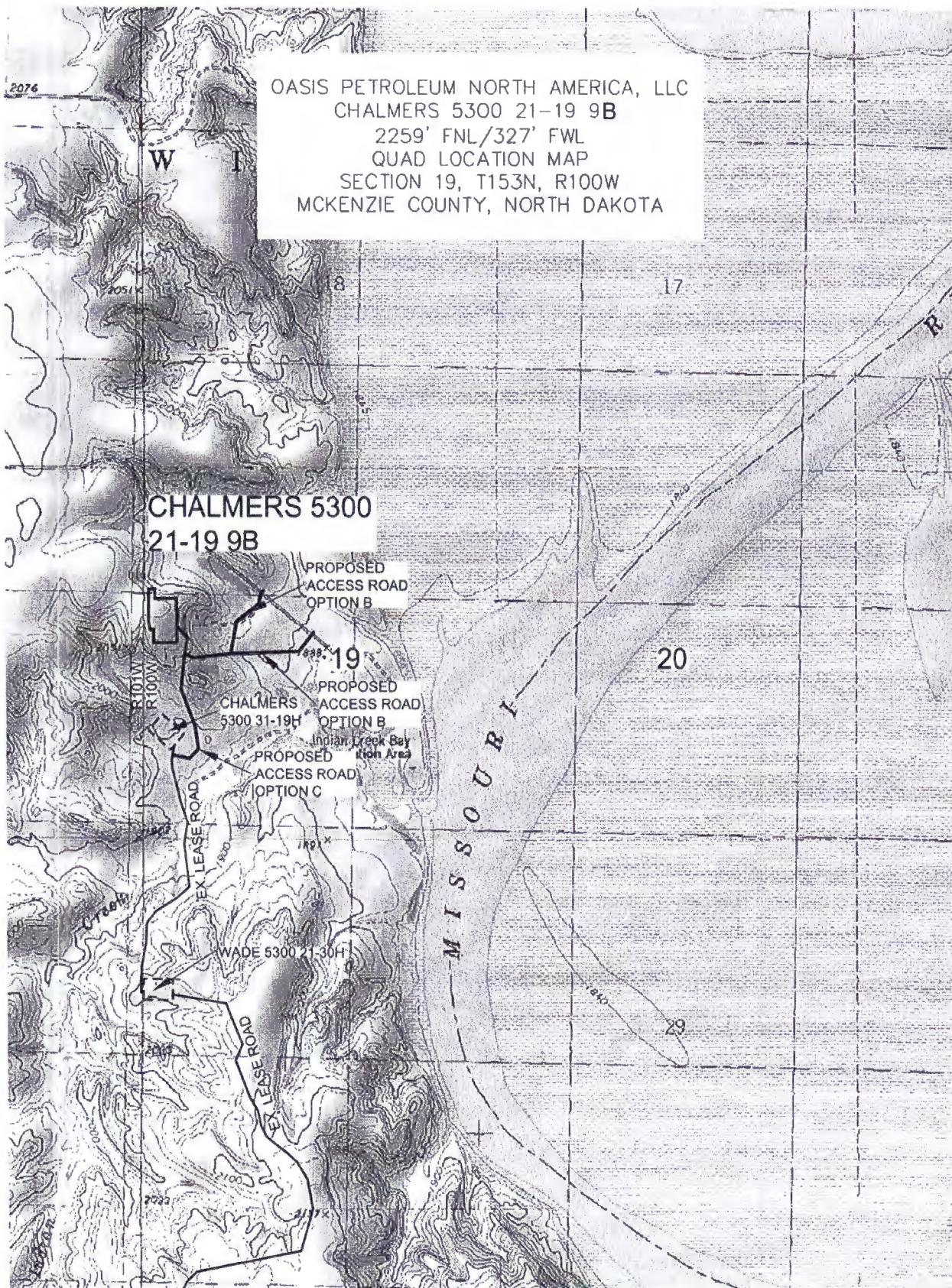


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0 500
1" = 500'



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

Drawn By:	B.H.H.	Project No.:	S13-09-282.04
Checked By:	D.D.K.	Date:	JAN. 2014

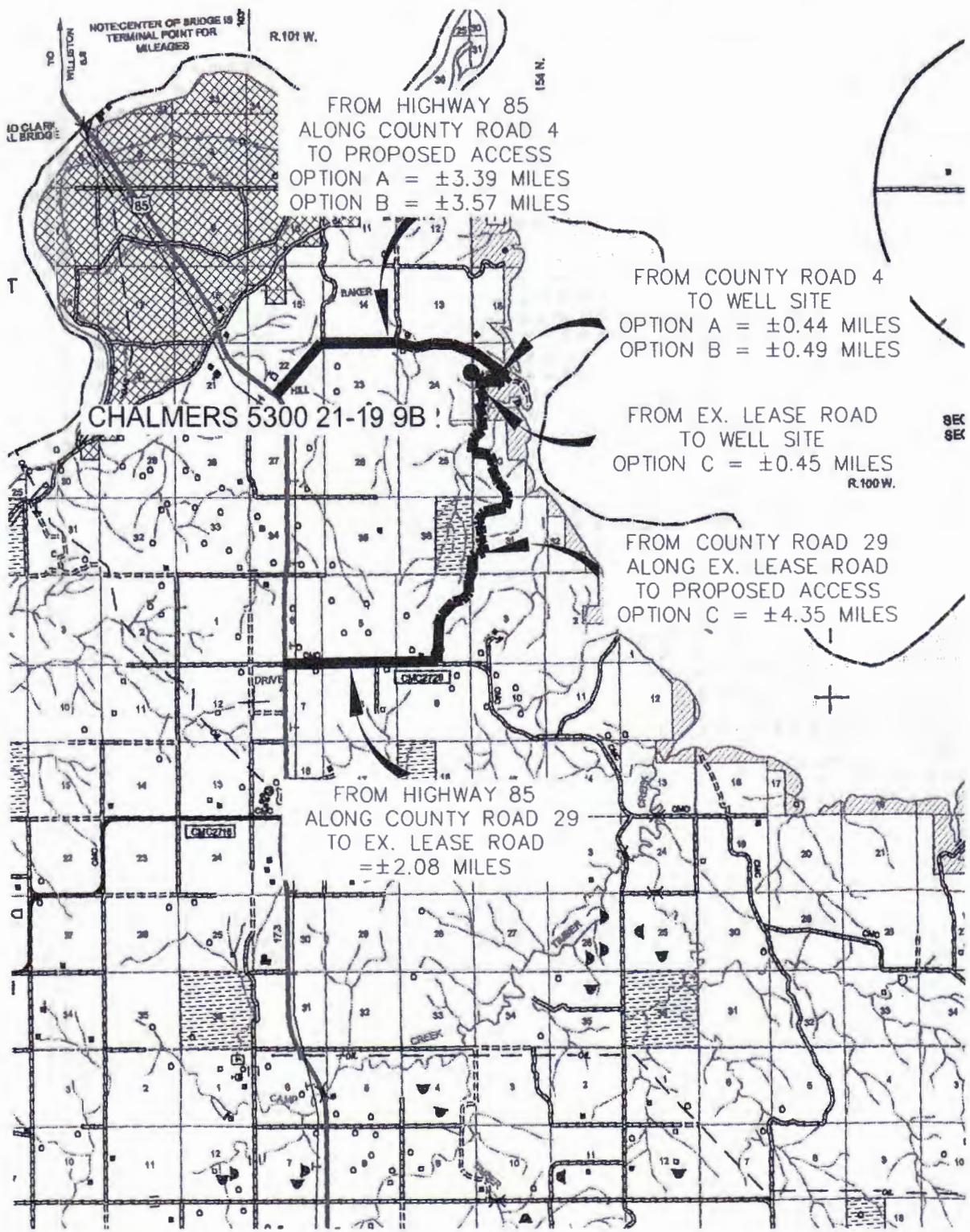
Revision No.	Date	By	Description
REV 1	3/2/14	JHS	MOVED WELLS ON PAD
REV 2	1/22/14	BHH	MOVED WELLS ON PAD/REVISED PAD
REV 3	5/2/14	BHH	MOVED WELLS ON PAD/REVISED PAD

COUNTY ROAD MAP

OASIS PETROLEUM NORTH AMERICA, LLC
1001 FANNIN, SUITE 1500, HOUSTON, TX 77002

"CHALMERS 5300 21-19 9B"

2259 FEET FROM NORTH LINE AND 327 FEET FROM WEST LINE
SECTION 19, T153N, R100W, 5th P.M., MCKENZIE COUNTY, NORTH DAKOTA



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Other offices in Minnesota, North Dakota and South Dakota

SCALE: 1" = 2 MILE

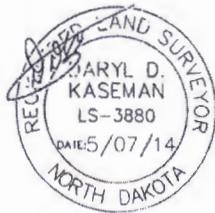
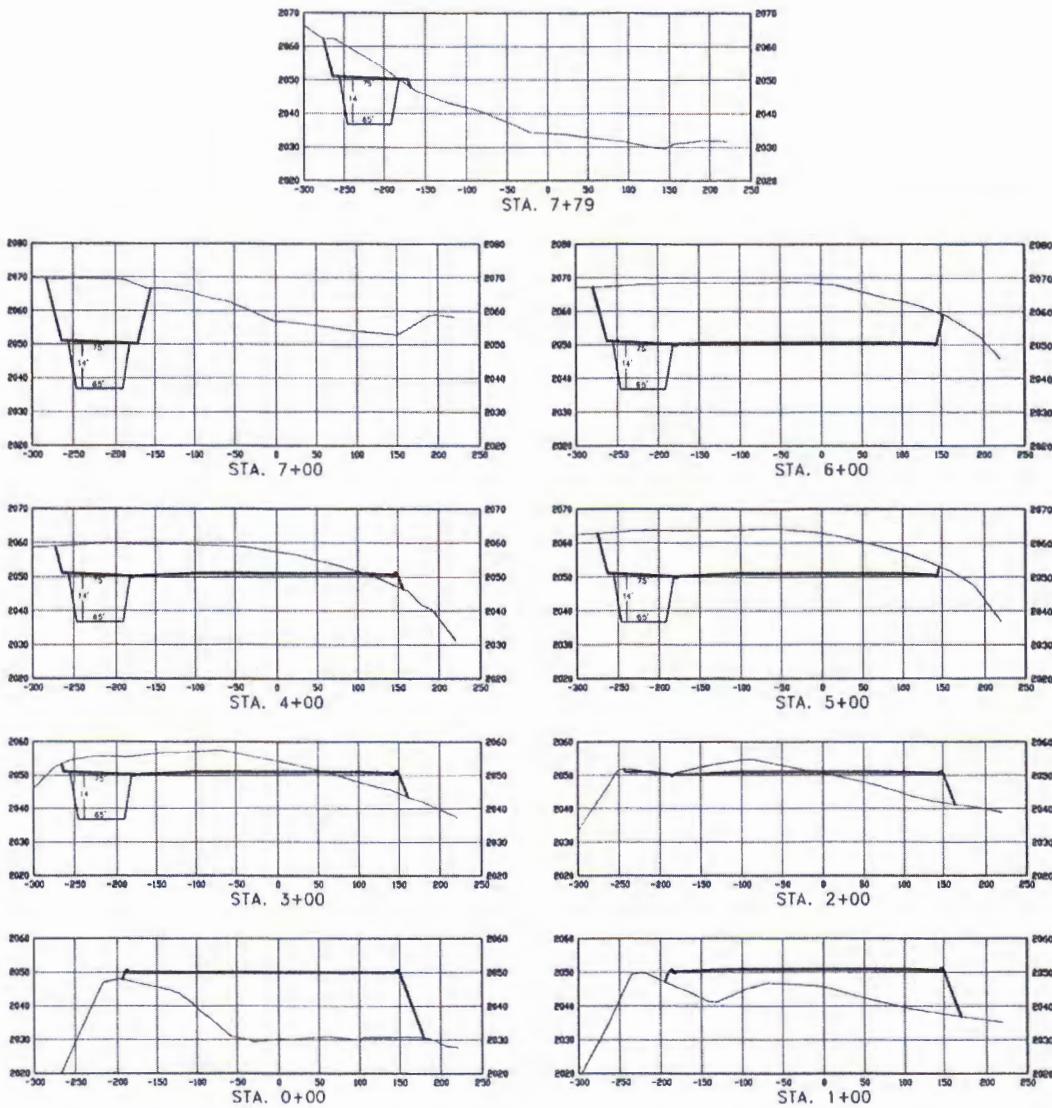
OASIS PETROLEUM NORTH AMERICA, LLC
COUNTY ROAD MAP
SECTION 19, T153N, R100W

MCKENZIE COUNTY, NORTH DAKOTA

Drawn By: B.H.H. Project No.: S13-09-282.04
Checked By: D.D.K. Date: JAN 2014

Revision No.	Date	By	Description
REV 1	1/12/14	BHS	MOVED WELLS ON PAD
REV 2	4/22/14	BHH	MOVED WELLS ON PAD/REVISED PAD
REV 3	5/2/14	BHH	MOVED WELLS ON PAD/REVISED PAD

CROSS SECTIONS
 OASIS PETROLEUM NORTH AMERICA, LLC
 1001 FANNIN, SUITE 1500, HOUSTON, TX 77002
 *CHALMERS 5300 21-19 9B
 2259 FEET FROM NORTH LINE AND 327 FEET FROM WEST LINE
 SECTION 19, T153N, R100W, 5th P.M., MCKENZIE COUNTY, NORTH DAKOTA



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SCALE
 HORIZ 1"=140'
 VERT 1"=35'

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Professional Engineers, Land Surveyors, and Geologists

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OASIS PETROLEUM NORTH AMERICA, LLC
 CROSS SECTIONS
 SECTION 19, T153N, R100W

MCKENZIE COUNTY, NORTH DAKOTA

Drawn By: B.H.S. Project No.: S1308-28/04

Checked By: D.O.K. Date: 5/13/2014

Revision No.	Date	By	Description
Rev 1	1/12/14	J-B	MOVED WELLS ON PAD
Rev 2	4/23/14	BHD	MOVED WELLS ON PAD/HEATED PAD
Rev 3	5/5/14	D-O-K	MOVED WELLS ON PolyHeated PAD

Document Generated Date: 5/14/2014 8:37:32 AM - 3.7 MB

WELL LOCATION SITE QUANTITIES
 OASIS PETROLEUM NORTH AMERICA, LLC
 1001 FANNIN, SUITE 1500, HOUSTON, TX 77002
 "CHALMERS 5300 21-19 9B
 2259 FEET FROM NORTH LINE AND 327 FEET FROM WEST LINE
 SECTION 19, T153N, R100W, 5th P.M., MCKENZIE COUNTY, NORTH DAKOTA

WELL SITE ELEVATION	2053.6
WELL PAD ELEVATION	2051.0
EXCAVATION	67,041
PLUS PIT	<u>22,050</u>
	89,091
EMBANKMENT	26,714
PLUS SHRINKAGE (25%)	<u>6,679</u>
	33,393
STOCKPILE PIT	22,050
STOCKPILE TOP SOIL (6")	5,434
BERMS	1,007 LF = 326 CY
DITCHES	1,768 LF = 270 CY
SCREENING BERM	27,464 CY
STOCKPILE MATERIAL	694
DISTURBED AREA FROM PAD	6.74 ACRES

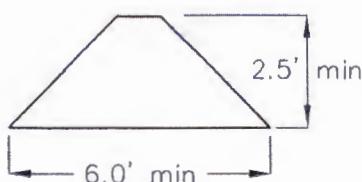
NOTE: ALL QUANTITIES ARE IN CUBIC YARDS (UNLESS NOTED)
 CUT END SLOPES AT 1:1
 FILL END SLOPES AT 1.5:1

WELL SITE LOCATION

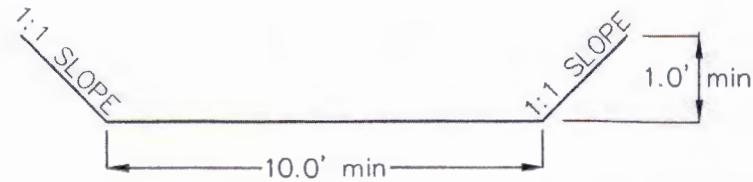
2259' FNL

327' FWL

BERM DETAIL



DITCH DETAIL



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Other offices in Montana, North Dakota and South Dakota

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

Drawn By: B.H.H.	Project No: 51349-282 04
Checked By: D.D.K.	Date: JAN 2014

Revision No.	Date	By	Description
REV 1	3/12/14	JJS	Moved wells on pad
REV 2	4/22/14	BHH	Moved wells on pad/revised pad
REV 3	5/2/14	BHH	Moved wells on pad/revised pad



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.

28648



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

<input checked="" type="checkbox"/> Notice of Intent	Approximate Start Date July 29, 2014	<input type="checkbox"/> Drilling Prognosis	<input type="checkbox"/> Spill Report
<input type="checkbox"/> Report of Work Done	Date Work Completed	<input type="checkbox"/> Redrilling or Repair	<input type="checkbox"/> Shooting
<input type="checkbox"/> 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	<input checked="" type="checkbox"/> Casing or Liner	<input type="checkbox"/> Acidizing
		<input type="checkbox"/> Plug Well	<input type="checkbox"/> Fracture Treatment
		<input type="checkbox"/> Supplemental History	<input type="checkbox"/> Change Production Method
		<input type="checkbox"/> Temporarily Abandon	<input type="checkbox"/> Reclamation
		<input type="checkbox"/> Other Change casing	

Well Name and Number Chalmers 5300 21-19 9T2					
Footages	Qtr-Qtr	Section	Township	Range	
2259 F N L	326 F W L	LOT2	19	153 N	100 W
Field	Pool	County			
	Bakken	McKenzie			

24-HOUR PRODUCTION RATE

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

Name of Contractor(s)			
Address	City	State	Zip Code

DETAILS OF WORK

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

- Surface casing changed to 13 3/8" and depth changed to 2,126'
- Contingency 9 5/8" casing added
- 7' casing changed to all 32#

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

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

FOR STATE USE ONLY

<input type="checkbox"/> Received	<input checked="" type="checkbox"/> Approved
Date <i>8-15-14</i>	
By <i>Heather McCowan</i>	
Title Petroleum Resource Specialist	

**Oasis Petroleum
Well Summary**
Chalmers 5300 21-19 9T2
Sec. 19 T153N R100W
McKenzie County, North Dakota

SURFACE CASING AND CEMENT DESIGN

Size	Interval	Weight	Grade	Coupling	I.D.	Drift	Make-up Torque (ft-lbs)		
							Minimum	Optimum	Max
13-3/8"	0' to 2,126'	54.5	J-55	STC	12.615"	12.459"	4,100	5,470	6,840

Interval	Description	Collapse	Burst	Tension	Cost per ft
		(psi) a	(psi) b	(1000 lbs) c	
0' to 2,126'	13-3/8", 54.5#, J-55, STC, 8rd	1130 / 1.14	2730 / 2.74	514 / 2.57	

API Rating & Safety Factor

- a) Collapse pressure based on full casing evacuation with 9 ppg fluid on backside (2126' setting depth).
- b) Burst pressure based on 9 ppg fluid with no fluid on backside (2126' setting depth).
- c) Tension based on string weight in 9 ppg fluid at 2126' TVD plus 100k# overpull. (Buoyed weight equals 100k lbs.)

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

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

Lead Slurry: **629 sks** (325 bbls) 2.9 yield conventional system with 94 lb/sk cement, .25 lb/sk D130 Lost Circulation Control Agent, 2% CaCL2, 4% D079 Extender, and 2% D053 Expanding Agent.

Tail Slurry: **374 sks** (77 bbls) 1.16 yield conventional system with 94 lb/sk cement, .25 lb/sk Lost Circulation Control Agent, and .25% CaCL2.

Oasis Petroleum
Well Summary
Chalmers 5300 21-19 9T2
Sec. 19 T153N R100W
McKenzie County, North Dakota

INTERMEDIATE CASING AND CEMENT DESIGN

Intermediate Casing Design

Size	Interval	Weight	Grade	Coupling	I.D.	Drift	Make-up Torque (ft-lbs)		
							Minimum	Optimum	Max
9-5/8"	0' - 6000'	40	HCL-80	LTC	8.835"	8.75***	5,450	7,270	9,090

**Special Drift

Interval	Description	Collapse	Burst	Tension
		(psi) a	(psi) b	(1000 lbs) c
0' - 6000'	9-5/8", 40#, HCL-80, LTC, 8rd	3090 / 3.96*	5750 / 1.23	837 / 2.75

API Rating & Safety Factor

- d) Collapse pressure based on 11.5ppg fluid on backside and 9ppg fluid inside of casing.
- e) Burst pressure calculated from a gas kick coming from the production zone (Bakken Pool) at 9,000psi and a subsequent breakdown at the 9-5/8" shoe, based on a 13.5#/ft fracture gradient. Backup of 9 ppg fluid.
- f) Tension based on string weight in 10 ppg fluid, (217k lbs buoyed weight) plus 100k lbs overpull.

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

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

Lead Slurry: **540 sks** (280 bbls) Conventional system with 75 lb/sk cement, 0.5lb/sk lost circulation, 10% expanding agent, 2% extender, 2% CaCl2, 0.2% anti foam, and 0.4% fluid loss

Tail Slurry: **373 sks** (77 bbls) Conventional system with 94 lb/sk cement, 0.3% anti-settling agent, 0.3% fluid loss agent, 0.3 lb/sk lost circulation control agent, 0.2% anti foam, and 0.1% retarder

**Oasis Petroleum
Well Summary
Chalmers 5300 21-19 9T2
Sec. 19 T153N R100W
McKenzie County, North Dakota**

INTERMEDIATE CASING AND CEMENT DESIGN

Intermediate Casing Design

Size	Interval	Weight	Grade	Coupling	I.D.	Drift	Make-up Torque (ft-lbs)		
							Minimum	Optimum	Max
7"	0' - 11132'	32	HCP-110	LTC	6.094"	6.000***	6730	8970	9870

**Special Drift

Interval	Description	Collapse	Burst	Tension
		(psi) a	(psi) b	(1000 lbs) c
0' - 11132'	7", 32#, P-110, LTC, 8rd	11820 / 2.09*	12460 / 1.28	897 / 2.23
6741' - 9209'	7", 32#, HCP-110, LTC, 8rd	11820 / 1.28**	12460 / 1.30	

API Rating & Safety Factor

- a. *Assume full casing evacuation with 10 ppg fluid on backside. **Assume full casing evacuation with 1.2 psi/ft equivalent fluid gradient across salt intervals.
- b. Burst pressure based on 9000 psig max press for stimulation plus 10.2 ppg fluid in casing and 9 ppg fluid on backside-to 10,852' TVD.
- c. Based on string weight in 10 ppg fluid, 302k lbs buoyed weight) plus 100k lbs overpull.

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

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

Lead Slurry: **219 sks** (86 bbls) 2.21 yield conventional system with 47 lb/sk cement, 37 lb/sk D035 Extender, 3.0% KCl, 3.0% D154 Extender, 0.3% D208 Viscosifier, 0.07% Retarder, 0.2% Anti Foam, 0.5lb/sk D130 LCM

Tail Slurry: **617 sks** (169 bbls) 1.54 yield conventional system with 94 lb/sk cement, 3.0% KCl, 35.0% Silica, 0.5% Retarder, 0.2% Fluid Loss, 0.2% Anti Foam, 0.5 lb/sk LCM

**Oasis Petroleum
Well Summary
Chalmers 5300 21-19 9T2
Sec. 19 T153N R100W
McKenzie County, North Dakota**

PRODUCTION LINER

Size	Interval	Weight	Grade	Coupling	I.D.	Drift	Torque
4-1/2"	10325' - 20670'	13.5	P-110	BTC	3.920"	3.795"	2270

Interval	Description	Collapse	Burst	Tension
		(psi) a	(psi) b	(1000 lbs) c
10325' - 20670'	4-1/2", 13.5 lb, P-110, BTC	10670 / 1.97	12410 / 1.28	443 / 2.01

API Rating & Safety Factor

- a) Based on full casing evacuation with 9.5 ppg fluid on backside @ 10919' TVD.
- b) Burst pressure based on 9000 psi treating pressure with 10.2 ppg internal fluid gradient and 9 ppg external fluid gradient @ 10919' TVD.
- c) Based on string weight in 9.5 ppg fluid (Buoyed weight: 119k lbs.) plus 100k lbs overpull.

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

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



Oil and Gas Division

Lynn D. Helms - Director

Bruce E. Hicks - Assistant Director

Department of Mineral Resources

Lynn D. Helms - Director

North Dakota Industrial Commission

www.dmr.nd.gov/oilgas

28648

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

Date: 6/23/2014

RE: CORES AND SAMPLES

Well Name: CHALMERS 5300 21-19 9T2 Well File No.: 28648
Location: LOT2 19-153-100 County: MCKENZIE
Permit Type: Development - HORIZONTAL
Field: BAKER Target Horizon: THREE FORKS B2

Dear BRANDI TERRY:

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

- 1) All cores, core chips and samples must be submitted to the State Geologist as provided for under North Dakota Century Code: Section 38-08-04 and North Dakota Administrative Code: Section 43-02-03-38.1.
- 2) Samples: The Operator is to begin collecting sample drill cuttings no lower than the:
Base of the Last Charles Salt
 - Sample cuttings shall be collected at:
 - o 30' maximum intervals through all vertical and build sections.
 - o 100' maximum intervals through any horizontal sections.
 - Samples must be washed, dried, placed in standard sample envelopes (3" x 4.5"), packed in the correct order into standard sample boxes (3.5" x 5.25" x 15.25").
 - Samples boxes are to be carefully identified with a label that indicates the operator, well name, well file number, American Petroleum Institute (API) number, location and depth of samples; and forwarded in to the state core and sample library within 30 days of the completion of drilling operations.
- 3) Cores: Any cores cut shall be preserved in correct order, boxed in standard core boxes (4.5", 4.5", 35.75"), and the entire core forwarded to the state core and samples library within 180 days of completion of drilling operations.
Any extension of time must have approval on a Form 4 Sundry Notice.

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

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

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

Sincerely

Stephen Fried
Geologist



SUNDRY NOTICES AND REPORTS ON WELLS - FO

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. 2864B

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

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

**Well Name and Number
Chalmers 5300 21-19 9T2**

Footages 2259 F N L	Qtr-Qtr 326 F W L	Section LOT2	Township 19	Range 153 N	100 W
Field	Pool Bakken			County McKenzie	

24-HOUR PRODUCTION RATE			
Before		After	
Oil	Bbls	Oil	Bbls
Water	Bbls	Water	Bbls
Gas	MCF	Gas	MCF

Name of Contractor(s)

Address

City

State

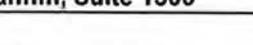
Zip Code

DETAILS OF WORK

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

The Oasis Petroleum Chalmers 5300 31-19H (NDIC 20407) located within a mile of the subject well.

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

Company Oasis Petroleum North America LLC		Telephone Number 281-404-9491
Address 1001 Fannin, Suite 1500		
City Houston		State TX
Signature 		Zip Code 77002
Printed Name Brandi Terry		
Title Regulatory Specialist		Date April 2, 2014
Email Address bterry@oasispetroleum.com		

FOR STATE USE ONLY	
<input type="checkbox"/> Received	<input checked="" type="checkbox"/> Approved
Date	6-17-2014
By	<i>Stephen Fried</i>
Title	Stephen Fried Geologist



SUNDRY NOTICES AND REPORTS ON WELLS - FORM 4

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

Well File No.
28648

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

<input checked="" type="checkbox"/> Notice of Intent	Approximate Start Date May 1, 2014	<input type="checkbox"/> Drilling Prognosis	<input type="checkbox"/> Spill Report
<input type="checkbox"/> Report of Work Done	Date Work Completed	<input type="checkbox"/> Redrilling or Repair	<input type="checkbox"/> Shooting
<input type="checkbox"/> Notice of Intent to Begin a Workover Project that may Qualify for a Tax Exemption Pursuant to NDCC Section 57-51.1-03.		<input type="checkbox"/> Casing or Liner	<input type="checkbox"/> Acidizing
Approximate Start Date		<input type="checkbox"/> Plug Well	<input type="checkbox"/> Fracture Treatment
		<input type="checkbox"/> Supplemental History	<input type="checkbox"/> Change Production Method
		<input type="checkbox"/> Temporarily Abandon	<input type="checkbox"/> Reclamation
		<input checked="" type="checkbox"/> Other	Suspension of Drilling

Well Name and Number Chalmers 5300 21-19 9T2						
Footages 2259 F N L	326 F	WL	Qtr-Qtr LOT2	Section 19	Township 153 N	Range 100 W
Field	Pool Bakken			County McKenzie		

24-HOUR PRODUCTION RATE			
Before		After	
Oil	Bbls	Oil	Bbls
Water	Bbls	Water	Bbls
Gas	MCF	Gas	MCF

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

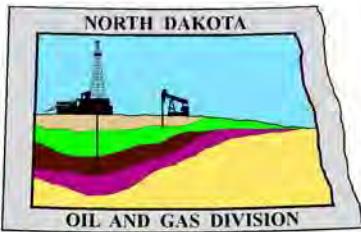
DETAILS OF WORK

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

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

Company Oasis Petroleum North America LLC	Telephone Number (281) 404-9491	
Address 1001 Fannin, Suite 1500		
City Houston	State TX	Zip Code 77002
Signature 	Printed Name Brandi Terry	
Title Regulatory Specialist	Date April 22, 2014	
Email Address bterry@oasispetroleum.com		

FOR STATE USE ONLY	
<input type="checkbox"/> Received	<input checked="" type="checkbox"/> Approved
Date 6/17/14	
By Nathaniel Erbele	
Title Petroleum Resource Specialist	



Oil and Gas Division

Lynn D. Helms - Director

Bruce E. Hicks - Assistant Director

Department of Mineral Resources

Lynn D. Helms - Director

North Dakota Industrial Commission

www.oilgas.nd.gov

June 17, 2014

Brandi Terry
Regulatory Specialist
OASIS PETROLEUM NORTH AMERICA LLC
1001 Fannin Suite 1500
Houston, TX 77002

**RE: HORIZONTAL WELL
CHALMERS 5300 21-19 9T2
LOT2 Section 19-153N-100W
McKenzie County
Well File # 28648**

Dear Brandi:

Pursuant to Commission Order No. 23752, approval to drill the above captioned well is hereby given. The approval is granted on the condition that all portions of the well bore not isolated by cement, be no closer than the **500' setback** from the north & south boundaries and **200' setback** from the east & west boundaries within the 1280 acre spacing unit consisting of Sections 19 &20 T153N R100W.

PERMIT STIPULATIONS: Due to the proximity of Lake Sakakawea to the well site, a dike is required surrounding the entire location. Effective June 1, 2014, a covered leak-proof container (with placard) for filter sock disposal must be maintained on the well site beginning when the well is spud, and must remain on-site during clean-out, completion, and flow-back whenever filtration operations are conducted. OASIS PETRO NO AMER must contact NDIC Field Inspector Richard Dunn at 701-7703-554 prior to location construction.

Drilling pit

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

Form 1 Changes & Hard Lines

Any changes, shortening of casing point or lengthening at Total Depth must have prior approval by the NDIC. The proposed directional plan is at a legal location. Based on the azimuth of the proposed lateral the maximum legal coordinate from the well head is: 9963' east.

Location Construction Commencement (Three Day Waiting Period)

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

Permit Fee & Notification

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

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

NDAC Section 43-02-03-25 (Deviation Tests and Directional Surveys) states in part (that) the survey contractor shall file a certified copy of all surveys with the director free of charge within thirty days of completion. Surveys must be submitted as one electronic copy, or in a form approved by the director. However, the director may require the directional survey to be filed immediately after completion if the survey is needed to conduct the operation of the director's office in a timely manner. Certified surveys must be submitted via email in one adobe document, with a certification cover page to certsurvey@nd.gov.

Survey points shall be of such frequency to accurately determine the entire location of the well bore.

Specifically, the Horizontal and Directional well survey frequency is 100 feet in the vertical, 30 feet in the curve (or when sliding) and 90 feet in the lateral.

Surface casing cement

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

Logs

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

Thank you for your cooperation.

Sincerely,

Nathaniel Erbele
Petroleum Resource Specialist



APPLICATION FOR PERMIT TO DRILL HORIZONTAL WELL - FORM 1H

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

PLEASE READ INSTRUCTIONS BEFORE FILLING OUT FORM.

PLEASE SUBMIT THE ORIGINAL AND ONE COPY.

Type of Work New Location	Type of Well Oil & Gas	Approximate Date Work Will Start 03 / 1 / 2014	Confidential Status No
Operator OASIS PETROLEUM NORTH AMERICA LLC		Telephone Number 281-404-9491	
Address 1001 Fannin Suite 1500		City Houston	State TX Zip Code 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 CHALMERS			Well Number 5300 21-19 9T2				
Surface Footages 2259 F N L		Qtr-Qtr LOT2	Section 19	Township 153 N	Range 100 W	County McKenzie	
Longstring Casing Point Footages 2439 F N L		Qtr-Qtr LOT2	Section 19	Township 153 N	Range 100 W	County McKenzie	
Longstring Casing Point Coordinates From Well Head 180 S From WH 451 E From WH		Azimuth 111.8 °	Longstring Total Depth 11133 Feet MD 10852 Feet TVD				
Bottom Hole Footages From Nearest Section Line 2636 F S L		Qtr-Qtr NESE	Section 20	Township 153 N	Range 100 W	County Williams	
Bottom Hole Coordinates From Well Head 385 S From WH 9962 E From WH		KOP Lateral 1 10375 Feet MD	Azimuth Lateral 1 90 °	Estimated Total Depth Lateral 1 20670 Feet MD 10919 Feet TVD			
Latitude of Well Head 48 ° 03 ' 40.97 "	Longitude of Well Head -103 ° 36 ' 10.11 "	NAD Reference NAD83		Description of Spacing Unit: Section 19 &20 T153N R100W (Subject to NDIC Approval)			
Ground Elevation 2054 Feet Above S.L.	Acres in Spacing/Drilling Unit 1280	Spacing/Drilling Unit Setback Requirement 500 Feet N/S 200 Feet E/W		Industrial Commission Order 23752			
North Line of Spacing/Drilling Unit 10489 Feet	South Line of Spacing/Drilling Unit 10513 Feet	East Line of Spacing/Drilling Unit 5280 Feet		West Line of Spacing/Drilling Unit 5263 Feet			
Objective Horizons Three Forks B2						Pierre Shale Top 2021	
Proposed Surface Casing	Size 9 - 5/8 "	Weight 36 Lb./Ft.	Depth 2150 Feet	Cement Volume 632 Sacks	NOTE: Surface hole must be drilled with fresh water and surface casing must be cemented back to surface.		
Proposed Longstring Casing	Size 7 - "	Weight(s) 29/32 Lb./Ft.	Longstring Total Depth 11133 Feet MD 10852 Feet TVD		Cement Volume 769 Sacks	Cement Top 3917 Feet	Top Dakota Sand 5417 Feet
Base Last Charles Salt (If Applicable) 9209 Feet		NOTE: Intermediate or longstring casing string must be cemented above the top Dakota Group Sand.					
Proposed Logs Triple Combo: KOP to Kibby GR/Res to BSC GR to surf CND through the Dakota							
Drilling Mud Type (Vertical Hole - Below Surface Casing) Invert				Drilling Mud Type (Lateral) Salt Water Gel			
Survey Type in Vertical Portion of Well MWD Every 100 Feet		Survey Frequency: Build Section 30 Feet		Survey Frequency: Lateral 90 Feet		Survey Contractor Ryan	

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

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

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

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

See Page 2 for Comments section and signature block.

COMMENTS, ADDITIONAL INFORMATION, AND/OR LIST OF ATTACHMENTS**Documents forwarded by email: Drill plan with drilling fluids, Well Summary with casing/cement plans, Directional Plan & Plot, Plots**

Lateral 2

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

Lateral 3

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

Lateral 4

KOP Lateral 4 Feet MD	Azimuth Lateral 4 °	Estimated Total Depth Lateral 4 Feet MD Feet TVD			KOP Coordinates From Well Head From WH From WH		
Formation Entry Point Coordinates From Well Head From WH		Bottom Hole Coordinates From Well Head From WH			From WH		
KOP Footages From Nearest Section Line F L		Qtr-Qtr	Section	Township N	Range W	County	
Bottom Hole Footages From Nearest Section Line F L		Qtr-Qtr	Section	Township N	Range W	County	

Lateral 5

KOP Lateral 5 Feet MD	Azimuth Lateral 5 °	Estimated Total Depth Lateral 5 Feet MD Feet TVD			KOP Coordinates From Well Head From WH From WH		
Formation Entry Point Coordinates From Well Head From WH		Bottom Hole Coordinates From Well Head From WH			From WH		
KOP Footages From Nearest Section Line F L		Qtr-Qtr	Section	Township N	Range W	County	
Bottom Hole Footages From Nearest Section Line 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

06 / 16 / 2014

ePermit

Printed Name
Brandi Terry

Title

Regulatory Specialist**FOR STATE USE ONLY**

Permit and File Number 28648	API Number 33 - 053 - 06023
Field BAKER	
Pool BAKKEN	Permit Type DEVELOPMENT

FOR STATE USE ONLY

Date Approved 6 / 17 / 2014
By Nathaniel Erbele
Title Petroleum Resource Specialist



Oil and Gas Division

Lynn D. Helms - Director

Bruce E. Hicks - Assistant Director

Department of Mineral Resources

Lynn D. Helms - Director

North Dakota Industrial Commission

www.oilgas.nd.gov

April 9, 2014

**RE: Filter Socks and Other Filter Media
Leakproof Container Required
Oil and Gas Wells**

Dear Operator,

North Dakota Administrative Code Section 43-02-03-19.2 states in part that all waste material associated with exploration or production of oil and gas must be properly disposed of in an authorized facility in accord with all applicable local, state, and federal laws and regulations.

Filtration systems are commonly used during oil and gas operations in North Dakota. The Commission is very concerned about the proper disposal of used filters (including filter socks) used by the oil and gas industry.

Effective June 1, 2014, a container must be maintained on each well drilled in North Dakota beginning when the well is spud and must remain on-site during clean-out, completion, and flow-back whenever filtration operations are conducted. The on-site container must be used to store filters until they can be properly disposed of in an authorized facility. Such containers must be:

- leakproof to prevent any fluids from escaping the container
- covered to prevent precipitation from entering the container
- placard to indicate only filters are to be placed in the container

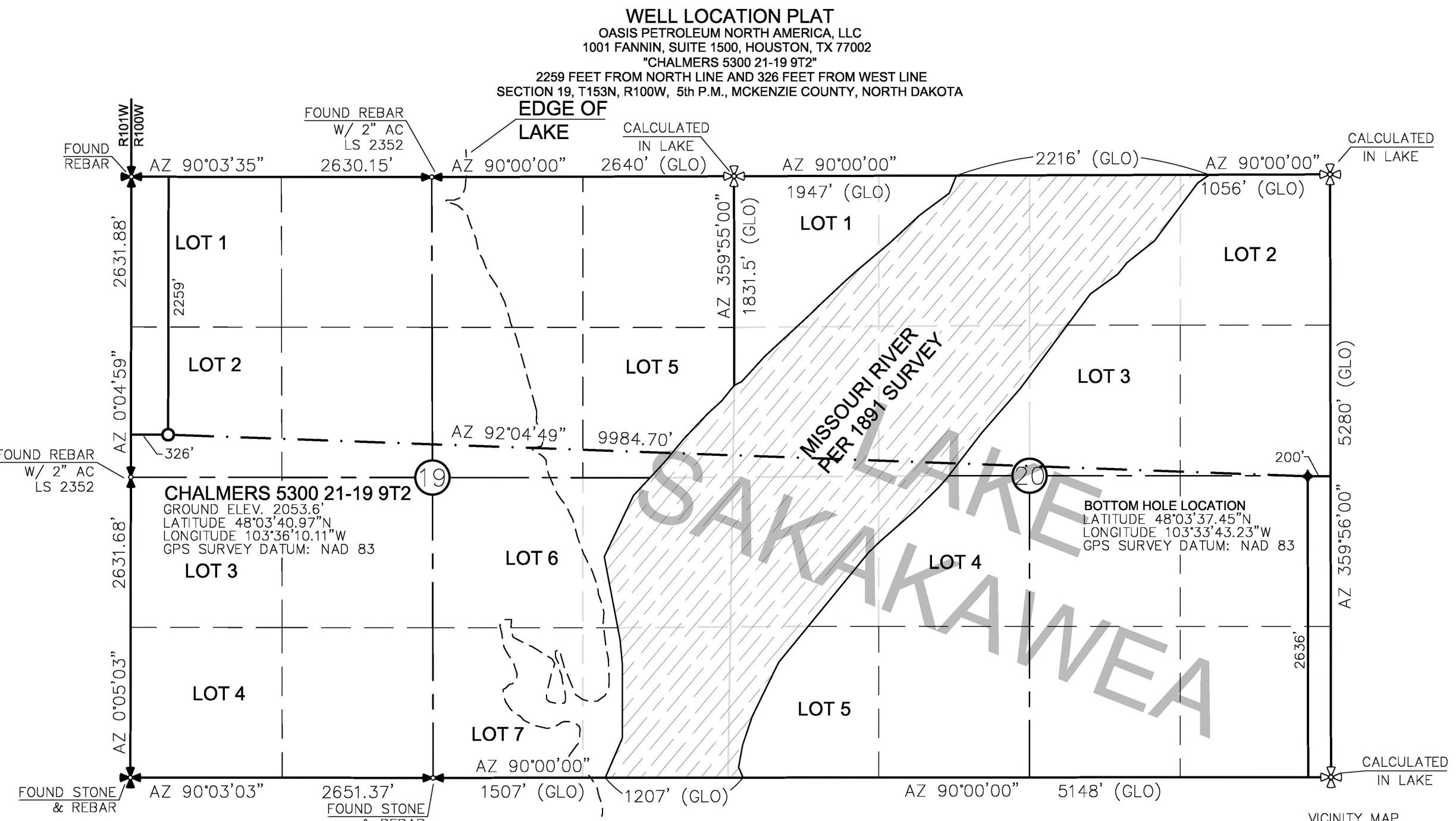
If the operator will not utilize a filtration system, a waiver to the container requirement will be considered, but only upon the operator submitting a Sundry Notice (Form 4) justifying their request.

As previously stated in our March 13, 2014 letter, North Dakota Administrative Code Section 33-20-02.1-01 states in part that every person who transports solid waste (which includes oil and gas exploration and production wastes) is required to have a valid permit issued by the North Dakota Department of Health, Division of Waste Management. Please contact the Division of Waste Management at (701) 328-5166 with any questions on the solid waste program. Note oil and gas exploration and production wastes include produced water, drilling mud, invert mud, tank bottom sediment, pipe scale, filters, and fly ash.

Thank you for your cooperation.

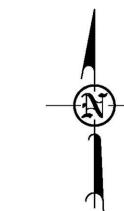
Sincerely,

Bruce E. Hicks
Assistant Director



THIS DOCUMENT WAS ORIGINALLY ISSUED
AND SEALED BY DARYL D. KASEMAN,
PLS, REGISTRATION NUMBER 3880 ON
3/13/14 AND THE ORIGINAL
DOCUMENTS ARE STORED AT THE
OFFICES OF INTERSTATE ENGINEERING,
INC.

- MONUMENT - RECOVERED
- MONUMENT - NOT RECOVERED

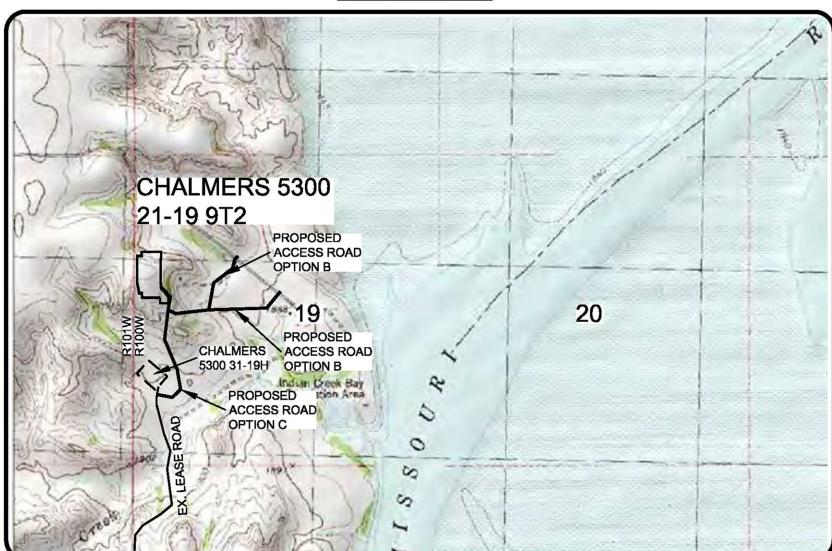
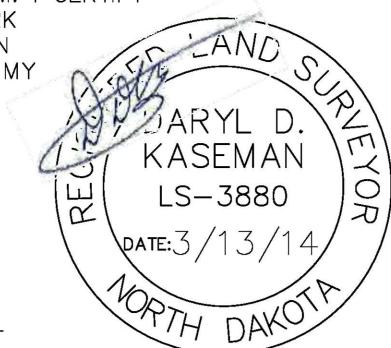


0
1" = 1000'

STAKED ON 1/29/14
VERTICAL CONTROL DATUM WAS BASED UPON
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.

DARYL D. KASEMAN LS-3880



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1/8

OASIS PETROLEUM NORTH AMERICA, LLC
WELL LOCATION PLAT
SECTION 19, T153N, R100W
MCKENZIE COUNTY, NORTH DAKOTA
Project No.: S13-08-282-04
Drawn By: BHH
Checked By: DDK
Date: JAN 2014

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OASIS PETROLEUM NORTH AMERICA, LLC
WELL LOCATION PLAT
SECTION 19, T153N, R100W
MCKENZIE COUNTY, NORTH DAKOTA
Project No.: S13-08-282-04
Drawn By: BHH
Checked By: DDK
Date: JAN 2014

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

Other offices in Minnesota, North Dakota and South Dakota

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OASIS PETROLEUM NORTH AMERICA, LLC
WELL LOCATION PLAT
SECTION 19, T153N, R100W
MCKENZIE COUNTY, NORTH DAKOTA
Project No.: S13-08-282-04
Drawn By: BHH
Checked By: DDK
Date: JAN 2014

INTERSTATE
ENGINEERING
Professionals you need, people you trust

SHEET NO.

DRILLING PLAN													
OPERATOR	Oasis Petroleum			COUNTY/STATE	McKenzie Co., ND								
WELL NAME	Chalmers 5300 21-19 9T2			RIG	B 22								
WELL TYPE	Horizontal 2nd Bench Three Forks			LOCATION	SW NW 19-153N-100W								
EST. T.D.	20,670'			Surface Location (survey plat):	2259' FNL	326' FWL	Sub Height: 25'						
TOTAL LATERAL:	9,538'			GROUND ELEV:	2,046'	KB ELEV:	2,071'						
MARKER		TVD	Subsea TVD	LOGS:	Type	Interval							
Pierre	NDIC MAP	2,021	50	OH Logs: Request a Sundry for an Open Hole Log Waiver: Oasis Chalmers 5300 31-19H 1,850' to S sec 19 153N 100W									
Greenhorn		4,624	-2,553	CBL/GR: Above top of cement/GR to base of casing									
Mowry		5,029	-2,958	MWD GR: KOP to lateral TD									
Dakota		5,417	-3,346										
Rierdon		6,463	-4,393	DEVIATION:	Surf: 3 deg. max., 1 deg / 100'; svry every 500'								
Dunham Salt		6,891	-4,820	Prod: 5 deg. max., 1 deg / 100'; svry every 100'									
Dunham Salt Base		6,960	-4,889										
Pine Salt		7,257	-5,186										
Pine Salt Base		7,290	-5,219										
Opecche Salt		7,351	-5,280										
Opecche Salt Base		7,426	-5,355										
Amsden		7,662	-5,591										
Tyler		7,828	-5,757										
Otter/Base Minnelusa		8,032	-5,961	DST'S:	None planned								
Kibbey Lime		8,384	-6,313										
Charles Salt		8,534	-6,463	CORES:	None planned								
Base Last Salt		9,209	-7,138										
Mission Canyon		9,429	-7,358										
Lodgepole		9,993	-7,922										
False Bakken		10,706	-8,635										
Upper Bakken Shale		10,716	-8,645	MUDLOGGING:	Two-Man: Begin 200' above Kibbey								
Middle Bakken		10,732	-8,661	30' samples in curve and lateral									
Lower Bakken Shale		10,766	-8,695										
Pronghorn		10,780	-8,709										
Threeforks 1st Bench		10,799	-8,728										
Claystone 1		10,822	-8,751										
Three Forks 2nd Bench		10,834	-8,763										
Target Top		10,841	-8,770	BOP:	11" 5000 psi blind, pipe & annular								
Target Base		10,862	-8,791										
Claystone 2		10,862	-8,791										
Est. Dip Rate:	-0.40												
Max. Anticipated BHP:	4671	Surface Formation: Glacial till											
MUD:	Interval	Type	WT	Vis	WL	Remarks							
Surface:	0' -	2,150'	FW	8.4-9.0	28-32	NC	Circ Mud Tanks						
Intermediate:	2,150' -	11,132'	Invert	9.5-10.4	40-50	30+HHp	Circ Mud Tanks						
Laterals:	11,132' -	20,670'	Salt Water	9.8-10.2	28-32	NC	Circ Mud Tanks						
CASING:	Size	Wt pfp	Hole	Depth	Cement	WOC	Remarks						
Surface:	9 5/8"	36#	13 1/2"	2,150'	To Surface	12	100' into Pierre						
Intermediate:	7"	32#	8 3/4"	11,132'	3917	24	1500' above Dakota						
Production Liner:	4.5"	13.5#	6"	20,670'	TOL @ 10,325'								
PROBABLE PLUGS, IF REQ'D:													
OTHER:	MD	TVD	ENL/FSL	FEL/FWL	S-T-R	AZI							
Surface:	2,150	2,150	2259 FNL	326 FWL	SEC. 19 T153N R100W	Survey Company:							
KOP:	10,375'	10,375'	2259 FNL	326 FWL	SEC. 19 T153N R100W	Build Rate:	12 deg /100'						
EOC:	11,121'	10,852'	2430 FNL	766 FWL	SEC. 19 T153N R100W	111.8							
Casing Point:	11,132'	10,852'	2439 FNL	777 FWL	SEC. 19 T153N R100W	111.8							
Three Forks 2nd Bench Lateral TD:	20,670'	10,919'	2636 FSL	200 FEL	SEC. 20 T153N R100W	90.0							
Comments:													
Request a Sundry for an Open Hole Log Waiver: Oasis Chalmers 5300 31-19H 1,850' to S sec 19 153N 100W													
No frac string planned													
35 packers and 25 sleeves planned 3.6MM lbs 30% ceramic													
Oasis Petroleum does not use Diesel Fuel, as defined by the US EPA in the list below, in our hydraulic fracture operations.													
68334-30-5 (Primary Name: Fuels, diesel) 68476-34-6 (Primary Name: Fuels, diesel, No. 2) 68476-30-2 (Primary Name: Fuel oil No. 2)													
68476-31-3 (Primary Name: Fuel oil, No. 4) 8008-20-6 (Primary Name: Kerosene)													
													
Geology: N. Gabelman	2/4/2014	Engineering: smg 3.25											

Oasis Petroleum
Well Summary
Chalmers 5300 21-19 9T2
Section 19 T153N R100W
McKenzie County, ND

SURFACE CASING AND CEMENT DESIGN

Size	Interval	Weight	Grade	Coupling	I.D.	Drift	Make-up Torque (ft-lbs)		
							Minimum	Optimum	Max
9-5/8"	0' - 2150'	36	J-55	LTC	8.921"	8.765"	3400	4530	5660

Interval	Description	Collapse	Burst	Tension
		(psi) / a	(psi) / b	(1000 lbs) / c
0' - 2150'	9-5/8", 36#, J-55, LTC, 8rd	2020 / 2.00	3520 / 3.49	453 / 2.71

API Rating & Safety Factor

- a) Based on full casing evacuation with 9 ppg fluid on backside (2150' setting depth).
- b) Burst pressure based on 9 ppg fluid with no fluid on backside (2150' setting depth).
- c) Based on string weight in 9 ppg fluid at 2150' TVD plus 100k# overpull. (Buoyed weight equals 67k lbs.)

Cement volumes are based on 9-5/8" casing set in 13-1/2 " hole with 60% excess to circulate cement back to surface.
Mix and pump the following slurry.

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

Lead Slurry: **459 sks** (243 bbls), 11.5 lb/gal, 2.97 cu. Ft./sk Varicem Cement with 0.125 il/sk Lost Circulation Additive

Tail Slurry: **173 sks** (62 bbls), 13.0 lb/gal, 2.01 cu.ft./sk Varicem with .125 lb/sk Lost Circulation Agent

Oasis Petroleum
Well Summary
Chalmers 5300 21-19 9T2
Section 19 T153N R100W
McKenzie County, ND

INTERMEDIATE CASING AND CEMENT DESIGN

Size	Interval	Weight	Grade	Coupling	I.D.	Drift**	Make-up Torque (ft-lbs)		
							Minimum	Optimum	Max
7"	0' - 11132'	32	HCP-110	LTC	6.094"	6.000"**	6730	8970	9870

**Special Drift 7" 32# to 6.0"

Interval	Length	Description	Collapse (psi) a	Burst (psi) b	Tension (1000 lbs) c
0' - 11132'	11132'	7", 32#, P-110, LTC, 8rd	11820 / 2.09*	12460 / 1.28	897 / 2.23
6691' - 9429'	2738'	7", 32#, HCP-110, LTC, 8rd	11820 / 1.04**	12460 / 1.29	

API Rating & Safety Factor

- a) *Assume full casing evacuation with 10 ppg fluid on backside. **Assume full casing evacuation with 1.2 psi/ft equivalent fluid gradient across salt intervals.
- b) Burst pressure based on 9000 psig max press for stimulation plus 10.2 ppg fluid in casing and 9 ppg fluid on backside-to 10852' TVD.
- c) Based on string weight in 10 ppg fluid, (302k lbs buoied weight) plus 100k lbs overpull.

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

Mix and pump the following slurry

Pre-flush (Spacer): **100 bbls** Saltwater

20bbls CW8

20bbls Fresh Water

Lead Slurry: **183 sks** (84 bbls), 11.8 ppg, 2.55 cu. ft./sk Econocem Cement with .3% Fe-2 and .25 lb/sk Lost Circulation Additive

Tail Slurry: **586 sks** (171 bbls), 14.0 ppg, 1.55 cu. ft./sk Extendcem System with .2% HR-5 Retarder and .25 lb/sk Lost Circulation Additive

Oasis Petroleum
Well Summary
Chalmers 5300 21-19 9T2
Section 19 T153N R100W
McKenzie County, ND

PRODUCTION LINER

Size	Interval	Weight	Grade	Coupling	I.D.	Drift	Make-up Torque (ft-lbs)		
							Minimum	Optimum	Max
4-1/2"	10325' - 20670	13.5	P-110	BTC	3.920"	3.795"	2270	3020	3780

Interval	Length	Description	Collapse (psi) a	Burst (psi) b	Tension (1000 lbs) c
10325' - 20670	10345	4-1/2", 13.5 lb, P-110, BTC	10670 / 1.97	12410 / 1.28	443 / 2.01

API Rating & Safety Factor

- a) Based on full casing evacuation with 9.5 ppg fluid on backside @ 10919' TVD.
- b) Burst pressure based on 9000 psi treating pressure with 10.2 ppg internal fluid gradient and 9 ppg external fluid gradient @ 10919' TVD.
- c) Based on string weight in 9.5 ppg fluid (Buoyed weight: 120k lbs.) plus 100k lbs overpull.



Azimuths to True North
Magnetic North: 8.17°

Magnetic Field
Strength: 56490.5nT
Dip Angle: 72.96°
Date: 2/17/2014
Model: IGRF200510

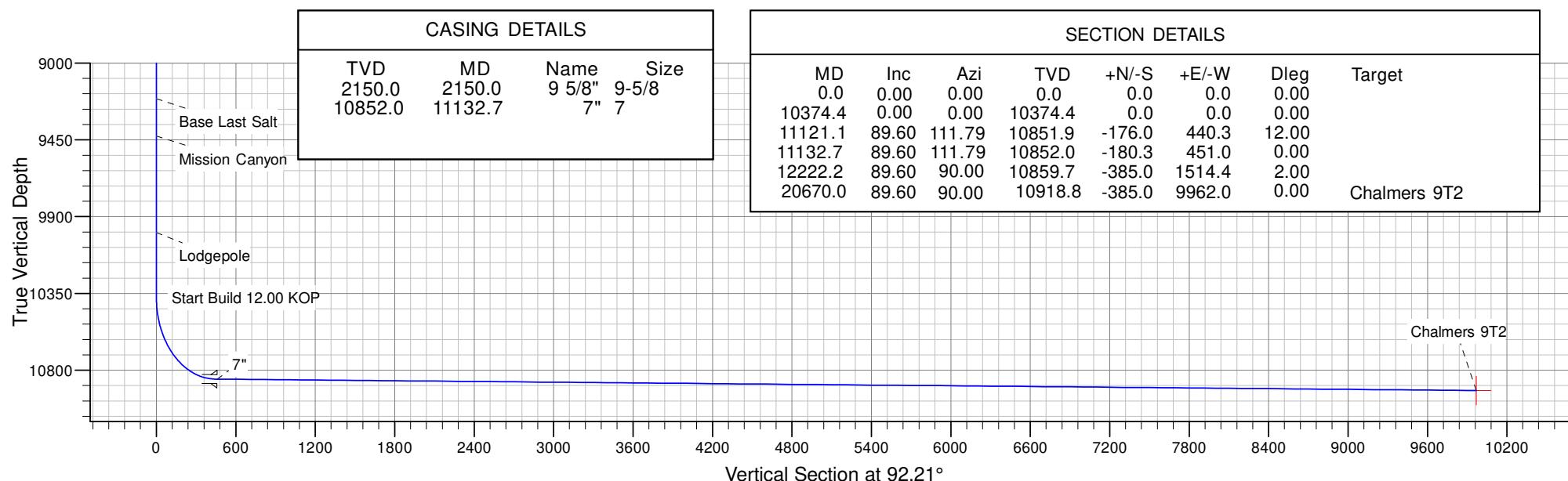
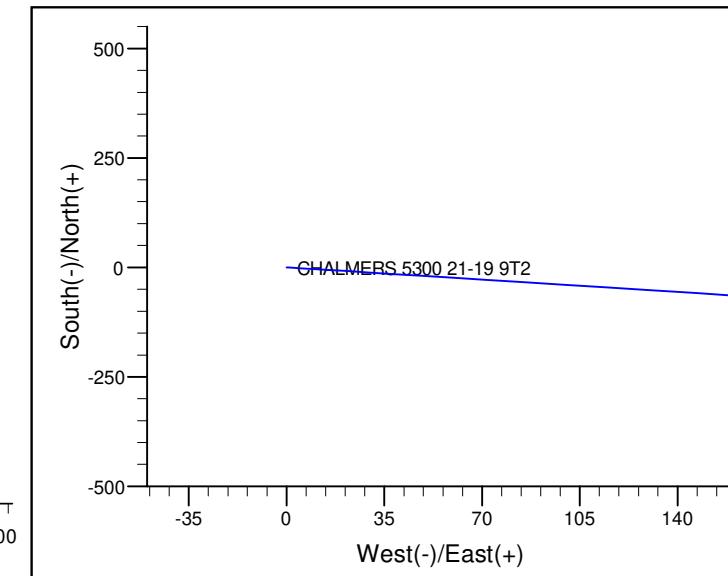
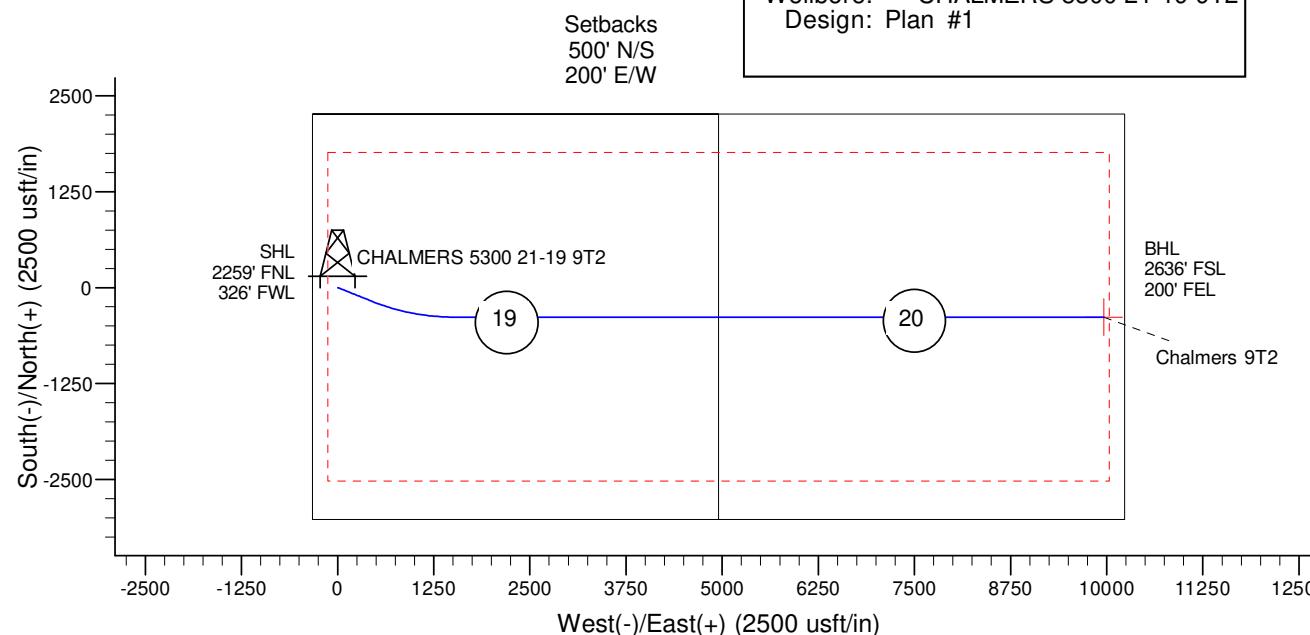


Project: Indian Hills
Site: 153N-100W-19/20
Well: CHALMERS 5300 21-19 9T2
Wellbore: CHALMERS 5300 21-19 9T2
Design: Plan #1

SITE DETAILS: 153N-100W-19/20

Well Centre Latitude: 48° 3' 40.970 N
Longitude: 103° 36' 10.110 W

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



Oasis

**Indian Hills
153N-100W-19/20
CHALMERS 5300 21-19 9T2**

CHALMERS 5300 21-19 9T2

Plan: Plan #1

Standard Planning Report

16 June, 2014

Oasis Petroleum

Planning Report

Database:	OpenWellsCompass - EDM Prod	Local Co-ordinate Reference:	Well CHALMERS 5300 21-19 9T2
Company:	Oasis	TVD Reference:	WELL @ 2071.0usft (Original Well Elev)
Project:	Indian Hills	MD Reference:	WELL @ 2071.0usft (Original Well Elev)
Site:	153N-100W-19/20	North Reference:	True
Well:	CHALMERS 5300 21-19 9T2	Survey Calculation Method:	Minimum Curvature
Wellbore:	CHALMERS 5300 21-19 9T2		
Design:	Plan #1		

Project	Indian Hills	
Map System:	US State Plane 1983	
Geo Datum:	North American Datum 1983	
Map Zone:	North Dakota Northern Zone	

Site	153N-100W-19/20
Site Position:	Northing: 402,776.24 usft
From: Lat/Long	Easting: 1,209,958.00 usft
Position Uncertainty: 0.0 usft	Slot Radius: 13-3/16 "

Latitude: 48° 3' 44.270 N
Longitude: 103° 36' 10.700 W
Grid Convergence: -2.31 °

Well	CHALMERS 5300 21-19 9T2
Well Position	+N/-S -334.4 usft Northing: 402,440.51 usft Latitude: 48° 3' 40.970 N
	+E/-W 40.1 usft Easting: 1,209,984.57 usft Longitude: 103° 36' 10.110 W
Position Uncertainty	0.0 usft Wellhead Elevation: Ground Level: 2,046.0 usft

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF200510	2/17/2014	8.17	72.96	56,491

Design	Plan #1
Audit Notes:	
Version:	Phase: PROTOTYPE Tie On Depth: 0.0
Vertical Section:	Depth From (TVD) (usft) +N/-S (usft) +E/-W (usft) Direction (°)
	0.0 0.0 0.0 92.21

Plan Sections										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00
10,374.4	0.00	0.00	10,374.4	0.0	0.0	0.00	0.00	0.00	0.00	0.00
11,121.1	89.60	111.79	10,851.9	-176.0	440.3	12.00	12.00	0.00	111.79	
11,132.7	89.60	111.79	10,852.0	-180.3	451.0	0.00	0.00	0.00	0.00	
12,222.2	89.60	90.00	10,859.7	-385.0	1,514.4	2.00	0.00	-2.00	269.92	
20,670.0	89.60	90.00	10,918.8	-385.0	9,962.0	0.00	0.00	0.00	0.00	Chalmers 9T2

Oasis Petroleum

Planning Report

Database:	OpenWellsCompass - EDM Prod	Local Co-ordinate Reference:	Well CHALMERS 5300 21-19 9T2
Company:	Oasis	TVD Reference:	WELL @ 2071.0usft (Original Well Elev)
Project:	Indian Hills	MD Reference:	WELL @ 2071.0usft (Original Well Elev)
Site:	153N-100W-19/20	North Reference:	True
Well:	CHALMERS 5300 21-19 9T2	Survey Calculation Method:	Minimum Curvature
Wellbore:	CHALMERS 5300 21-19 9T2		
Design:	Plan #1		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/S (usft)	+E/W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00
100.0	0.00	0.00	100.0	0.0	0.0	0.0	0.00	0.00	0.00
200.0	0.00	0.00	200.0	0.0	0.0	0.0	0.00	0.00	0.00
300.0	0.00	0.00	300.0	0.0	0.0	0.0	0.00	0.00	0.00
400.0	0.00	0.00	400.0	0.0	0.0	0.0	0.00	0.00	0.00
500.0	0.00	0.00	500.0	0.0	0.0	0.0	0.00	0.00	0.00
600.0	0.00	0.00	600.0	0.0	0.0	0.0	0.00	0.00	0.00
700.0	0.00	0.00	700.0	0.0	0.0	0.0	0.00	0.00	0.00
800.0	0.00	0.00	800.0	0.0	0.0	0.0	0.00	0.00	0.00
900.0	0.00	0.00	900.0	0.0	0.0	0.0	0.00	0.00	0.00
1,000.0	0.00	0.00	1,000.0	0.0	0.0	0.0	0.00	0.00	0.00
1,100.0	0.00	0.00	1,100.0	0.0	0.0	0.0	0.00	0.00	0.00
1,200.0	0.00	0.00	1,200.0	0.0	0.0	0.0	0.00	0.00	0.00
1,300.0	0.00	0.00	1,300.0	0.0	0.0	0.0	0.00	0.00	0.00
1,400.0	0.00	0.00	1,400.0	0.0	0.0	0.0	0.00	0.00	0.00
1,500.0	0.00	0.00	1,500.0	0.0	0.0	0.0	0.00	0.00	0.00
1,600.0	0.00	0.00	1,600.0	0.0	0.0	0.0	0.00	0.00	0.00
1,700.0	0.00	0.00	1,700.0	0.0	0.0	0.0	0.00	0.00	0.00
1,800.0	0.00	0.00	1,800.0	0.0	0.0	0.0	0.00	0.00	0.00
1,900.0	0.00	0.00	1,900.0	0.0	0.0	0.0	0.00	0.00	0.00
2,000.0	0.00	0.00	2,000.0	0.0	0.0	0.0	0.00	0.00	0.00
2,021.0	0.00	0.00	2,021.0	0.0	0.0	0.0	0.00	0.00	0.00
Pierre									
2,100.0	0.00	0.00	2,100.0	0.0	0.0	0.0	0.00	0.00	0.00
2,150.0	0.00	0.00	2,150.0	0.0	0.0	0.0	0.00	0.00	0.00
9 5/8"									
2,200.0	0.00	0.00	2,200.0	0.0	0.0	0.0	0.00	0.00	0.00
2,300.0	0.00	0.00	2,300.0	0.0	0.0	0.0	0.00	0.00	0.00
2,400.0	0.00	0.00	2,400.0	0.0	0.0	0.0	0.00	0.00	0.00
2,500.0	0.00	0.00	2,500.0	0.0	0.0	0.0	0.00	0.00	0.00
2,600.0	0.00	0.00	2,600.0	0.0	0.0	0.0	0.00	0.00	0.00
2,700.0	0.00	0.00	2,700.0	0.0	0.0	0.0	0.00	0.00	0.00
2,800.0	0.00	0.00	2,800.0	0.0	0.0	0.0	0.00	0.00	0.00
2,900.0	0.00	0.00	2,900.0	0.0	0.0	0.0	0.00	0.00	0.00
3,000.0	0.00	0.00	3,000.0	0.0	0.0	0.0	0.00	0.00	0.00
3,100.0	0.00	0.00	3,100.0	0.0	0.0	0.0	0.00	0.00	0.00
3,200.0	0.00	0.00	3,200.0	0.0	0.0	0.0	0.00	0.00	0.00
3,300.0	0.00	0.00	3,300.0	0.0	0.0	0.0	0.00	0.00	0.00
3,400.0	0.00	0.00	3,400.0	0.0	0.0	0.0	0.00	0.00	0.00
3,500.0	0.00	0.00	3,500.0	0.0	0.0	0.0	0.00	0.00	0.00
3,600.0	0.00	0.00	3,600.0	0.0	0.0	0.0	0.00	0.00	0.00
3,700.0	0.00	0.00	3,700.0	0.0	0.0	0.0	0.00	0.00	0.00
3,800.0	0.00	0.00	3,800.0	0.0	0.0	0.0	0.00	0.00	0.00
3,900.0	0.00	0.00	3,900.0	0.0	0.0	0.0	0.00	0.00	0.00
4,000.0	0.00	0.00	4,000.0	0.0	0.0	0.0	0.00	0.00	0.00
4,100.0	0.00	0.00	4,100.0	0.0	0.0	0.0	0.00	0.00	0.00
4,200.0	0.00	0.00	4,200.0	0.0	0.0	0.0	0.00	0.00	0.00
4,300.0	0.00	0.00	4,300.0	0.0	0.0	0.0	0.00	0.00	0.00
4,400.0	0.00	0.00	4,400.0	0.0	0.0	0.0	0.00	0.00	0.00
4,500.0	0.00	0.00	4,500.0	0.0	0.0	0.0	0.00	0.00	0.00
4,600.0	0.00	0.00	4,600.0	0.0	0.0	0.0	0.00	0.00	0.00
4,624.0	0.00	0.00	4,624.0	0.0	0.0	0.0	0.00	0.00	0.00
Greenhorn									
4,700.0	0.00	0.00	4,700.0	0.0	0.0	0.0	0.00	0.00	0.00
4,800.0	0.00	0.00	4,800.0	0.0	0.0	0.0	0.00	0.00	0.00

Oasis Petroleum

Planning Report

Database:	OpenWellsCompass - EDM Prod	Local Co-ordinate Reference:	Well CHALMERS 5300 21-19 9T2
Company:	Oasis	TVD Reference:	WELL @ 2071.0usft (Original Well Elev)
Project:	Indian Hills	MD Reference:	WELL @ 2071.0usft (Original Well Elev)
Site:	153N-100W-19/20	North Reference:	True
Well:	CHALMERS 5300 21-19 9T2	Survey Calculation Method:	Minimum Curvature
Wellbore:	CHALMERS 5300 21-19 9T2		
Design:	Plan #1		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/S (usft)	+E/W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
4,900.0	0.00	0.00	4,900.0	0.0	0.0	0.0	0.00	0.00	0.00
5,000.0	0.00	0.00	5,000.0	0.0	0.0	0.0	0.00	0.00	0.00
5,029.0	0.00	0.00	5,029.0	0.0	0.0	0.0	0.00	0.00	0.00
Mowry									
5,100.0	0.00	0.00	5,100.0	0.0	0.0	0.0	0.00	0.00	0.00
5,200.0	0.00	0.00	5,200.0	0.0	0.0	0.0	0.00	0.00	0.00
5,300.0	0.00	0.00	5,300.0	0.0	0.0	0.0	0.00	0.00	0.00
5,400.0	0.00	0.00	5,400.0	0.0	0.0	0.0	0.00	0.00	0.00
5,417.0	0.00	0.00	5,417.0	0.0	0.0	0.0	0.00	0.00	0.00
Dakota									
5,500.0	0.00	0.00	5,500.0	0.0	0.0	0.0	0.00	0.00	0.00
5,600.0	0.00	0.00	5,600.0	0.0	0.0	0.0	0.00	0.00	0.00
5,700.0	0.00	0.00	5,700.0	0.0	0.0	0.0	0.00	0.00	0.00
5,800.0	0.00	0.00	5,800.0	0.0	0.0	0.0	0.00	0.00	0.00
5,900.0	0.00	0.00	5,900.0	0.0	0.0	0.0	0.00	0.00	0.00
6,000.0	0.00	0.00	6,000.0	0.0	0.0	0.0	0.00	0.00	0.00
6,100.0	0.00	0.00	6,100.0	0.0	0.0	0.0	0.00	0.00	0.00
6,200.0	0.00	0.00	6,200.0	0.0	0.0	0.0	0.00	0.00	0.00
6,300.0	0.00	0.00	6,300.0	0.0	0.0	0.0	0.00	0.00	0.00
6,400.0	0.00	0.00	6,400.0	0.0	0.0	0.0	0.00	0.00	0.00
6,463.0	0.00	0.00	6,463.0	0.0	0.0	0.0	0.00	0.00	0.00
Rierdon									
6,500.0	0.00	0.00	6,500.0	0.0	0.0	0.0	0.00	0.00	0.00
6,600.0	0.00	0.00	6,600.0	0.0	0.0	0.0	0.00	0.00	0.00
6,700.0	0.00	0.00	6,700.0	0.0	0.0	0.0	0.00	0.00	0.00
6,800.0	0.00	0.00	6,800.0	0.0	0.0	0.0	0.00	0.00	0.00
6,891.0	0.00	0.00	6,891.0	0.0	0.0	0.0	0.00	0.00	0.00
Dunham Salt									
6,900.0	0.00	0.00	6,900.0	0.0	0.0	0.0	0.00	0.00	0.00
6,960.0	0.00	0.00	6,960.0	0.0	0.0	0.0	0.00	0.00	0.00
Dunham Salt Base									
7,000.0	0.00	0.00	7,000.0	0.0	0.0	0.0	0.00	0.00	0.00
7,100.0	0.00	0.00	7,100.0	0.0	0.0	0.0	0.00	0.00	0.00
7,200.0	0.00	0.00	7,200.0	0.0	0.0	0.0	0.00	0.00	0.00
7,257.0	0.00	0.00	7,257.0	0.0	0.0	0.0	0.00	0.00	0.00
Pine Salt									
7,290.0	0.00	0.00	7,290.0	0.0	0.0	0.0	0.00	0.00	0.00
Pine Salt Base									
7,300.0	0.00	0.00	7,300.0	0.0	0.0	0.0	0.00	0.00	0.00
7,351.0	0.00	0.00	7,351.0	0.0	0.0	0.0	0.00	0.00	0.00
Opecche Salt									
7,400.0	0.00	0.00	7,400.0	0.0	0.0	0.0	0.00	0.00	0.00
7,426.0	0.00	0.00	7,426.0	0.0	0.0	0.0	0.00	0.00	0.00
Opecche Salt Base									
7,500.0	0.00	0.00	7,500.0	0.0	0.0	0.0	0.00	0.00	0.00
7,600.0	0.00	0.00	7,600.0	0.0	0.0	0.0	0.00	0.00	0.00
7,662.0	0.00	0.00	7,662.0	0.0	0.0	0.0	0.00	0.00	0.00
Amsden									
7,700.0	0.00	0.00	7,700.0	0.0	0.0	0.0	0.00	0.00	0.00
7,800.0	0.00	0.00	7,800.0	0.0	0.0	0.0	0.00	0.00	0.00
7,828.0	0.00	0.00	7,828.0	0.0	0.0	0.0	0.00	0.00	0.00
Tyler									
7,900.0	0.00	0.00	7,900.0	0.0	0.0	0.0	0.00	0.00	0.00
8,000.0	0.00	0.00	8,000.0	0.0	0.0	0.0	0.00	0.00	0.00

Oasis Petroleum

Planning Report

Database:	OpenWellsCompass - EDM Prod	Local Co-ordinate Reference:	Well CHALMERS 5300 21-19 9T2
Company:	Oasis	TVD Reference:	WELL @ 2071.0usft (Original Well Elev)
Project:	Indian Hills	MD Reference:	WELL @ 2071.0usft (Original Well Elev)
Site:	153N-100W-19/20	North Reference:	True
Well:	CHALMERS 5300 21-19 9T2	Survey Calculation Method:	Minimum Curvature
Wellbore:	CHALMERS 5300 21-19 9T2		
Design:	Plan #1		

Planned Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/S (usft)	+E/W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
8,032.0	0.00	0.00	8,032.0	0.0	0.0	0.0	0.00	0.00	0.00	
Otter/Base Minnelusa										
8,100.0	0.00	0.00	8,100.0	0.0	0.0	0.0	0.00	0.00	0.00	
8,200.0	0.00	0.00	8,200.0	0.0	0.0	0.0	0.00	0.00	0.00	
8,300.0	0.00	0.00	8,300.0	0.0	0.0	0.0	0.00	0.00	0.00	
8,384.0	0.00	0.00	8,384.0	0.0	0.0	0.0	0.00	0.00	0.00	
Kibbey Lime										
8,400.0	0.00	0.00	8,400.0	0.0	0.0	0.0	0.00	0.00	0.00	
8,500.0	0.00	0.00	8,500.0	0.0	0.0	0.0	0.00	0.00	0.00	
8,534.0	0.00	0.00	8,534.0	0.0	0.0	0.0	0.00	0.00	0.00	
Charles Salt										
8,600.0	0.00	0.00	8,600.0	0.0	0.0	0.0	0.00	0.00	0.00	
8,700.0	0.00	0.00	8,700.0	0.0	0.0	0.0	0.00	0.00	0.00	
8,800.0	0.00	0.00	8,800.0	0.0	0.0	0.0	0.00	0.00	0.00	
8,900.0	0.00	0.00	8,900.0	0.0	0.0	0.0	0.00	0.00	0.00	
9,000.0	0.00	0.00	9,000.0	0.0	0.0	0.0	0.00	0.00	0.00	
9,100.0	0.00	0.00	9,100.0	0.0	0.0	0.0	0.00	0.00	0.00	
9,200.0	0.00	0.00	9,200.0	0.0	0.0	0.0	0.00	0.00	0.00	
9,209.0	0.00	0.00	9,209.0	0.0	0.0	0.0	0.00	0.00	0.00	
Base Last Salt										
9,300.0	0.00	0.00	9,300.0	0.0	0.0	0.0	0.00	0.00	0.00	
9,400.0	0.00	0.00	9,400.0	0.0	0.0	0.0	0.00	0.00	0.00	
9,429.0	0.00	0.00	9,429.0	0.0	0.0	0.0	0.00	0.00	0.00	
Mission Canyon										
9,500.0	0.00	0.00	9,500.0	0.0	0.0	0.0	0.00	0.00	0.00	
9,600.0	0.00	0.00	9,600.0	0.0	0.0	0.0	0.00	0.00	0.00	
9,700.0	0.00	0.00	9,700.0	0.0	0.0	0.0	0.00	0.00	0.00	
9,800.0	0.00	0.00	9,800.0	0.0	0.0	0.0	0.00	0.00	0.00	
9,900.0	0.00	0.00	9,900.0	0.0	0.0	0.0	0.00	0.00	0.00	
9,993.0	0.00	0.00	9,993.0	0.0	0.0	0.0	0.00	0.00	0.00	
Lodgepole										
10,000.0	0.00	0.00	10,000.0	0.0	0.0	0.0	0.00	0.00	0.00	
10,100.0	0.00	0.00	10,100.0	0.0	0.0	0.0	0.00	0.00	0.00	
10,200.0	0.00	0.00	10,200.0	0.0	0.0	0.0	0.00	0.00	0.00	
10,300.0	0.00	0.00	10,300.0	0.0	0.0	0.0	0.00	0.00	0.00	
10,374.4	0.00	0.00	10,374.4	0.0	0.0	0.0	0.00	0.00	0.00	
Start Build 12.00 KOP										
10,400.0	3.07	111.79	10,400.0	-0.3	0.6	0.6	12.00	12.00	0.00	
10,425.0	6.07	111.79	10,424.9	-1.0	2.5	2.5	12.00	12.00	0.00	
10,450.0	9.07	111.79	10,449.7	-2.2	5.5	5.6	12.00	12.00	0.00	
10,475.0	12.07	111.79	10,474.3	-3.9	9.8	9.9	12.00	12.00	0.00	
10,500.0	15.07	111.79	10,498.6	-6.1	15.2	15.5	12.00	12.00	0.00	
10,525.0	18.07	111.79	10,522.5	-8.7	21.9	22.2	12.00	12.00	0.00	
10,550.0	21.07	111.79	10,546.1	-11.8	29.6	30.1	12.00	12.00	0.00	
10,575.0	24.07	111.79	10,569.2	-15.4	38.5	39.1	12.00	12.00	0.00	
10,600.0	27.07	111.79	10,591.7	-19.4	48.6	49.3	12.00	12.00	0.00	
10,625.0	30.07	111.79	10,613.7	-23.8	59.7	60.5	12.00	12.00	0.00	
10,650.0	33.07	111.79	10,635.0	-28.7	71.8	72.9	12.00	12.00	0.00	
10,675.0	36.07	111.79	10,655.5	-34.0	85.0	86.2	12.00	12.00	0.00	
10,700.0	39.07	111.79	10,675.4	-39.6	99.1	100.6	12.00	12.00	0.00	
10,725.0	42.07	111.79	10,694.3	-45.7	114.2	115.9	12.00	12.00	0.00	
10,740.9	43.98	111.79	10,706.0	-49.7	124.3	126.1	12.00	12.00	0.00	
False Bakken										
10,750.0	45.07	111.79	10,712.5	-52.1	130.2	132.1	12.00	12.00	0.00	

Oasis Petroleum

Planning Report

Database:	OpenWellsCompass - EDM Prod	Local Co-ordinate Reference:	Well CHALMERS 5300 21-19 9T2
Company:	Oasis	TVD Reference:	WELL @ 2071.0usft (Original Well Elev)
Project:	Indian Hills	MD Reference:	WELL @ 2071.0usft (Original Well Elev)
Site:	153N-100W-19/20	North Reference:	True
Well:	CHALMERS 5300 21-19 9T2	Survey Calculation Method:	Minimum Curvature
Wellbore:	CHALMERS 5300 21-19 9T2		
Design:	Plan #1		

Planned Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N-S (usft)	+E-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
10,755.0	45.67	111.79	10,716.0	-53.4	133.5	135.5	12.00	12.00	0.00	
Upper Bakken Shale										
10,775.0	48.07	111.79	10,729.6	-58.8	147.1	149.2	12.00	12.00	0.00	
10,778.5	48.49	111.79	10,732.0	-59.8	149.5	151.7	12.00	12.00	0.00	
Middle Bakken										
10,800.0	51.07	111.79	10,745.9	-65.9	164.7	167.2	12.00	12.00	0.00	
10,825.0	54.07	111.79	10,761.0	-73.2	183.2	185.9	12.00	12.00	0.00	
10,833.5	55.09	111.79	10,766.0	-75.8	189.6	192.4	12.00	12.00	0.00	
Lower Bakken Shale										
10,850.0	57.07	111.79	10,775.2	-80.9	202.3	205.3	12.00	12.00	0.00	
10,859.0	58.14	111.79	10,780.0	-83.7	209.3	212.4	12.00	12.00	0.00	
Pronghorn										
10,875.0	60.07	111.79	10,788.2	-88.8	222.1	225.4	12.00	12.00	0.00	
10,897.5	62.77	111.79	10,799.0	-96.1	240.5	244.0	12.00	12.00	0.00	
Threeforks 1st Bench										
10,900.0	63.07	111.79	10,800.1	-97.0	242.5	246.1	12.00	12.00	0.00	
10,925.0	66.07	111.79	10,810.9	-105.3	263.5	267.4	12.00	12.00	0.00	
10,950.0	69.07	111.79	10,820.4	-113.9	284.9	289.1	12.00	12.00	0.00	
10,954.5	69.61	111.79	10,822.0	-115.5	288.8	293.1	12.00	12.00	0.00	
Claystone 1										
10,975.0	72.07	111.79	10,828.7	-122.7	306.8	311.3	12.00	12.00	0.00	
10,993.2	74.25	111.79	10,834.0	-129.1	323.0	327.7	12.00	12.00	0.00	
Three Forks 2nd Bench										
11,000.0	75.07	111.79	10,835.8	-131.6	329.1	333.9	12.00	12.00	0.00	
11,022.1	77.72	111.79	10,841.0	-139.5	349.0	354.2	12.00	12.00	0.00	
Target Top										
11,025.0	78.07	111.79	10,841.6	-140.6	351.7	356.8	12.00	12.00	0.00	
11,050.0	81.07	111.79	10,846.1	-149.7	374.5	380.0	12.00	12.00	0.00	
11,075.0	84.07	111.79	10,849.4	-158.9	397.5	403.4	12.00	12.00	0.00	
11,100.0	87.07	111.79	10,851.3	-168.2	420.7	426.8	12.00	12.00	0.00	
11,121.1	89.60	111.79	10,851.9	-176.0	440.3	446.7	12.00	12.00	0.00	
Start 11.6 hold at 11121.1 MD EOC										
11,132.7	89.60	111.79	10,852.0	-180.3	451.0	457.6	0.00	0.00	0.00	
Start DLS 2.00 TFO 269.92 Csg Pt - 7"										
11,200.0	89.60	110.44	10,852.4	-204.6	513.8	521.3	2.00	0.00	-2.00	
11,300.0	89.60	108.44	10,853.2	-237.8	608.1	616.8	2.00	0.00	-2.00	
11,400.0	89.59	106.44	10,853.9	-267.8	703.5	713.3	2.00	0.00	-2.00	
11,500.0	89.59	104.44	10,854.6	-294.4	799.9	810.6	2.00	0.00	-2.00	
11,600.0	89.59	102.44	10,855.3	-317.7	897.1	908.7	2.00	0.00	-2.00	
11,700.0	89.59	100.44	10,856.0	-337.5	995.1	1,007.4	2.00	0.00	-2.00	
11,800.0	89.59	98.44	10,856.7	-353.9	1,093.8	1,106.6	2.00	0.00	-2.00	
11,900.0	89.59	96.44	10,857.4	-366.9	1,192.9	1,206.2	2.00	0.00	-2.00	
12,000.0	89.59	94.44	10,858.1	-376.4	1,292.4	1,306.0	2.00	0.00	-2.00	
12,100.0	89.60	92.44	10,858.8	-382.4	1,392.3	1,406.0	2.00	0.00	-2.00	
12,200.0	89.60	90.44	10,859.5	-384.9	1,492.2	1,506.0	2.00	0.00	-2.00	
12,222.2	89.60	90.00	10,859.7	-385.0	1,514.4	1,528.1	2.00	0.00	-2.00	
Start 8458.3 hold at 12222.2 MD										
12,300.0	89.60	90.00	10,860.2	-385.0	1,592.2	1,605.9	0.00	0.00	0.00	
12,400.0	89.60	90.00	10,860.9	-385.0	1,692.2	1,705.8	0.00	0.00	0.00	
12,500.0	89.60	90.00	10,861.6	-385.0	1,792.2	1,805.7	0.00	0.00	0.00	
12,600.0	89.60	90.00	10,862.3	-385.0	1,892.2	1,905.7	0.00	0.00	0.00	
12,700.0	89.60	90.00	10,863.0	-385.0	1,992.2	2,005.6	0.00	0.00	0.00	
12,800.0	89.60	90.00	10,863.7	-385.0	2,092.2	2,105.5	0.00	0.00	0.00	
12,900.0	89.60	90.00	10,864.4	-385.0	2,192.2	2,205.4	0.00	0.00	0.00	

Oasis Petroleum

Planning Report

Database:	OpenWellsCompass - EDM Prod	Local Co-ordinate Reference:	Well CHALMERS 5300 21-19 9T2
Company:	Oasis	TVD Reference:	WELL @ 2071.0usft (Original Well Elev)
Project:	Indian Hills	MD Reference:	WELL @ 2071.0usft (Original Well Elev)
Site:	153N-100W-19/20	North Reference:	True
Well:	CHALMERS 5300 21-19 9T2	Survey Calculation Method:	Minimum Curvature
Wellbore:	CHALMERS 5300 21-19 9T2		
Design:	Plan #1		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
13,000.0	89.60	90.00	10,865.1	-385.0	2,292.2	2,305.4	0.00	0.00	0.00
13,100.0	89.60	90.00	10,865.8	-385.0	2,392.2	2,405.3	0.00	0.00	0.00
13,200.0	89.60	90.00	10,866.5	-385.0	2,492.2	2,505.2	0.00	0.00	0.00
13,300.0	89.60	90.00	10,867.2	-385.0	2,592.2	2,605.1	0.00	0.00	0.00
13,400.0	89.60	90.00	10,867.9	-385.0	2,692.2	2,705.0	0.00	0.00	0.00
13,500.0	89.60	90.00	10,868.6	-385.0	2,792.2	2,805.0	0.00	0.00	0.00
13,600.0	89.60	90.00	10,869.3	-385.0	2,892.2	2,904.9	0.00	0.00	0.00
13,700.0	89.60	90.00	10,870.0	-385.0	2,992.2	3,004.8	0.00	0.00	0.00
13,800.0	89.60	90.00	10,870.7	-385.0	3,092.2	3,104.7	0.00	0.00	0.00
13,900.0	89.60	90.00	10,871.4	-385.0	3,192.2	3,204.7	0.00	0.00	0.00
14,000.0	89.60	90.00	10,872.1	-385.0	3,292.2	3,304.6	0.00	0.00	0.00
14,100.0	89.60	90.00	10,872.8	-385.0	3,392.2	3,404.5	0.00	0.00	0.00
14,200.0	89.60	90.00	10,873.5	-385.0	3,492.2	3,504.4	0.00	0.00	0.00
14,300.0	89.60	90.00	10,874.2	-385.0	3,592.2	3,604.4	0.00	0.00	0.00
14,400.0	89.60	90.00	10,874.9	-385.0	3,692.2	3,704.3	0.00	0.00	0.00
14,500.0	89.60	90.00	10,875.6	-385.0	3,792.2	3,804.2	0.00	0.00	0.00
14,600.0	89.60	90.00	10,876.3	-385.0	3,892.2	3,904.1	0.00	0.00	0.00
14,700.0	89.60	90.00	10,877.0	-385.0	3,992.2	4,004.0	0.00	0.00	0.00
14,800.0	89.60	90.00	10,877.7	-385.0	4,092.2	4,104.0	0.00	0.00	0.00
14,900.0	89.60	90.00	10,878.4	-385.0	4,192.1	4,203.9	0.00	0.00	0.00
15,000.0	89.60	90.00	10,879.1	-385.0	4,292.1	4,303.8	0.00	0.00	0.00
15,100.0	89.60	90.00	10,879.8	-385.0	4,392.1	4,403.7	0.00	0.00	0.00
15,200.0	89.60	90.00	10,880.5	-385.0	4,492.1	4,503.7	0.00	0.00	0.00
15,300.0	89.60	90.00	10,881.2	-385.0	4,592.1	4,603.6	0.00	0.00	0.00
15,400.0	89.60	90.00	10,881.9	-385.0	4,692.1	4,703.5	0.00	0.00	0.00
15,500.0	89.60	90.00	10,882.6	-385.0	4,792.1	4,803.4	0.00	0.00	0.00
15,600.0	89.60	90.00	10,883.3	-385.0	4,892.1	4,903.3	0.00	0.00	0.00
15,700.0	89.60	90.00	10,884.0	-385.0	4,992.1	5,003.3	0.00	0.00	0.00
15,800.0	89.60	90.00	10,884.7	-385.0	5,092.1	5,103.2	0.00	0.00	0.00
15,900.0	89.60	90.00	10,885.4	-385.0	5,192.1	5,203.1	0.00	0.00	0.00
16,000.0	89.60	90.00	10,886.1	-385.0	5,292.1	5,303.0	0.00	0.00	0.00
16,100.0	89.60	90.00	10,886.8	-385.0	5,392.1	5,403.0	0.00	0.00	0.00
16,200.0	89.60	90.00	10,887.5	-385.0	5,492.1	5,502.9	0.00	0.00	0.00
16,300.0	89.60	90.00	10,888.2	-385.0	5,592.1	5,602.8	0.00	0.00	0.00
16,400.0	89.60	90.00	10,888.9	-385.0	5,692.1	5,702.7	0.00	0.00	0.00
16,500.0	89.60	90.00	10,889.6	-385.0	5,792.1	5,802.7	0.00	0.00	0.00
16,600.0	89.60	90.00	10,890.3	-385.0	5,892.1	5,902.6	0.00	0.00	0.00
16,700.0	89.60	90.00	10,891.0	-385.0	5,992.1	6,002.5	0.00	0.00	0.00
16,800.0	89.60	90.00	10,891.7	-385.0	6,092.1	6,102.4	0.00	0.00	0.00
16,900.0	89.60	90.00	10,892.4	-385.0	6,192.1	6,202.3	0.00	0.00	0.00
17,000.0	89.60	90.00	10,893.1	-385.0	6,292.1	6,302.3	0.00	0.00	0.00
17,100.0	89.60	90.00	10,893.8	-385.0	6,392.1	6,402.2	0.00	0.00	0.00
17,200.0	89.60	90.00	10,894.5	-385.0	6,492.1	6,502.1	0.00	0.00	0.00
17,300.0	89.60	90.00	10,895.2	-385.0	6,592.1	6,602.0	0.00	0.00	0.00
17,400.0	89.60	90.00	10,895.9	-385.0	6,692.1	6,702.0	0.00	0.00	0.00
17,500.0	89.60	90.00	10,896.6	-385.0	6,792.1	6,801.9	0.00	0.00	0.00
17,600.0	89.60	90.00	10,897.3	-385.0	6,892.1	6,901.8	0.00	0.00	0.00
17,700.0	89.60	90.00	10,898.0	-385.0	6,992.1	7,001.7	0.00	0.00	0.00
17,800.0	89.60	90.00	10,898.7	-385.0	7,092.1	7,101.7	0.00	0.00	0.00
17,900.0	89.60	90.00	10,899.4	-385.0	7,192.1	7,201.6	0.00	0.00	0.00
18,000.0	89.60	90.00	10,900.1	-385.0	7,292.1	7,301.5	0.00	0.00	0.00
18,100.0	89.60	90.00	10,900.8	-385.0	7,392.1	7,401.4	0.00	0.00	0.00
18,200.0	89.60	90.00	10,901.5	-385.0	7,492.1	7,501.3	0.00	0.00	0.00
18,300.0	89.60	90.00	10,902.2	-385.0	7,592.1	7,601.3	0.00	0.00	0.00
18,400.0	89.60	90.00	10,902.9	-385.0	7,692.1	7,701.2	0.00	0.00	0.00

Oasis Petroleum

Planning Report

Database: OpenWellsCompass - EDM Prod	Local Co-ordinate Reference:	Well CHALMERS 5300 21-19 9T2
Company: Oasis	TVD Reference:	WELL @ 2071.0usft (Original Well Elev)
Project: Indian Hills	MD Reference:	WELL @ 2071.0usft (Original Well Elev)
Site: 153N-100W-19/20	North Reference:	True
Well: CHALMERS 5300 21-19 9T2	Survey Calculation Method:	Minimum Curvature
Wellbore: CHALMERS 5300 21-19 9T2		
Design: Plan #1		

Planned Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
18,500.0	89.60	90.00	10,903.6	-385.0	7,792.1	7,801.1	0.00	0.00	0.00	
18,600.0	89.60	90.00	10,904.3	-385.0	7,892.1	7,901.0	0.00	0.00	0.00	
18,700.0	89.60	90.00	10,905.0	-385.0	7,992.1	8,001.0	0.00	0.00	0.00	
18,800.0	89.60	90.00	10,905.7	-385.0	8,092.1	8,100.9	0.00	0.00	0.00	
18,900.0	89.60	90.00	10,906.4	-385.0	8,192.1	8,200.8	0.00	0.00	0.00	
19,000.0	89.60	90.00	10,907.1	-385.0	8,292.0	8,300.7	0.00	0.00	0.00	
19,100.0	89.60	90.00	10,907.8	-385.0	8,392.0	8,400.7	0.00	0.00	0.00	
19,200.0	89.60	90.00	10,908.5	-385.0	8,492.0	8,500.6	0.00	0.00	0.00	
19,300.0	89.60	90.00	10,909.2	-385.0	8,592.0	8,600.5	0.00	0.00	0.00	
19,400.0	89.60	90.00	10,909.9	-385.0	8,692.0	8,700.4	0.00	0.00	0.00	
19,500.0	89.60	90.00	10,910.6	-385.0	8,792.0	8,800.3	0.00	0.00	0.00	
19,600.0	89.60	90.00	10,911.3	-385.0	8,892.0	8,900.3	0.00	0.00	0.00	
19,700.0	89.60	90.00	10,912.0	-385.0	8,992.0	9,000.2	0.00	0.00	0.00	
19,800.0	89.60	90.00	10,912.7	-385.0	9,092.0	9,100.1	0.00	0.00	0.00	
19,900.0	89.60	90.00	10,913.4	-385.0	9,192.0	9,200.0	0.00	0.00	0.00	
20,000.0	89.60	90.00	10,914.1	-385.0	9,292.0	9,300.0	0.00	0.00	0.00	
20,100.0	89.60	90.00	10,914.8	-385.0	9,392.0	9,399.9	0.00	0.00	0.00	
20,200.0	89.60	90.00	10,915.5	-385.0	9,492.0	9,499.8	0.00	0.00	0.00	
20,300.0	89.60	90.00	10,916.2	-385.0	9,592.0	9,599.7	0.00	0.00	0.00	
20,400.0	89.60	90.00	10,916.9	-385.0	9,692.0	9,699.7	0.00	0.00	0.00	
20,500.0	89.60	90.00	10,917.6	-385.0	9,792.0	9,799.6	0.00	0.00	0.00	
20,600.0	89.60	90.00	10,918.3	-385.0	9,892.0	9,899.5	0.00	0.00	0.00	
20,670.0	89.60	90.00	10,918.8	-385.0	9,962.0	9,969.4	0.00	0.00	0.00	

Design Targets										
Target Name		Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
- hit/miss target	- Shape	0.00	0.00	10,918.9	-385.3	9,962.0	401,654.18	1,219,922.96	48° 3' 37.141 N	103° 33' 43.450 W
- plan misses target center by 0.3usft at 20670.0usft MD (10918.8 TVD, -385.0 N, 9962.0 E)										
- Point										

Casing Points										
Measured Depth (usft)	Vertical Depth (usft)	Name				Casing Diameter ("")	Hole Diameter ("")			
2,150.0	2,150.0	9 5/8"				9-5/8	13-1/2			
11,132.7	10,852.0	7"				7	8-3/4			

Oasis Petroleum

Planning Report

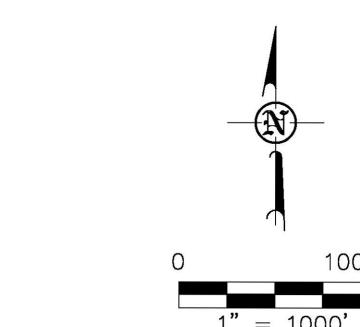
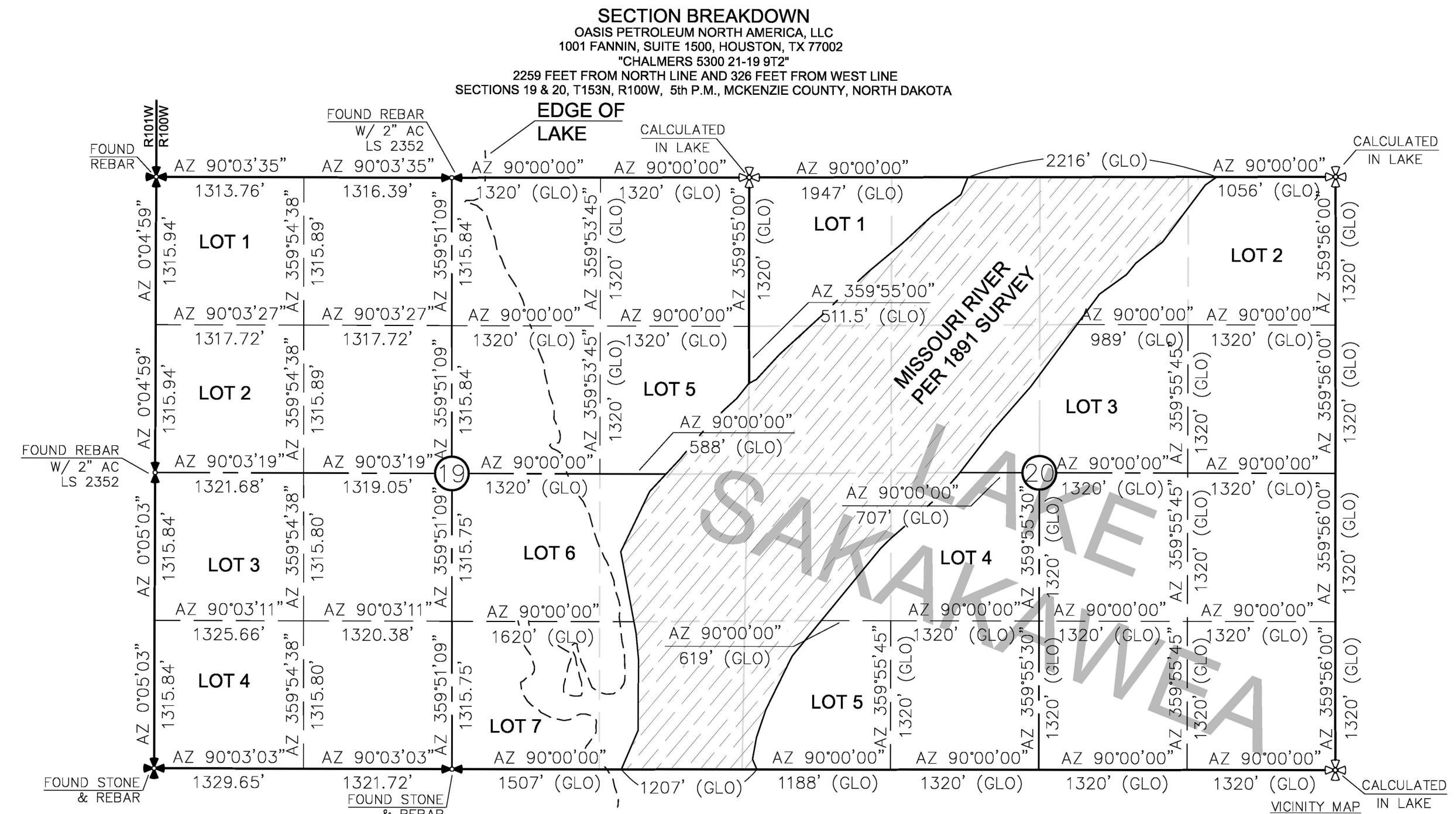
Database:	OpenWellsCompass - EDM Prod	Local Co-ordinate Reference:	Well CHALMERS 5300 21-19 9T2
Company:	Oasis	TVD Reference:	WELL @ 2071.0usft (Original Well Elev)
Project:	Indian Hills	MD Reference:	WELL @ 2071.0usft (Original Well Elev)
Site:	153N-100W-19 20	North Reference:	True
Well:	CHALMERS 5300 21-19 9T2	Survey Calculation Method:	Minimum Curvature
Wellbore:	CHALMERS 5300 21-19 9T2		
Design:	Plan #1		

Formations

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
2,021.0	2,021.0	Pierre			
4,624.0	4,624.0	Greenhorn			
5,029.0	5,029.0	Mowry			
5,417.0	5,417.0	Dakota			
6,463.0	6,463.0	Rierdon			
6,891.0	6,891.0	Dunham Salt			
6,960.0	6,960.0	Dunham Salt Base			
7,257.0	7,257.0	Pine Salt			
7,290.0	7,290.0	Pine Salt Base			
7,351.0	7,351.0	Opeche Salt			
7,426.0	7,426.0	Opeche Salt Base			
7,662.0	7,662.0	Amsden			
7,828.0	7,828.0	Tyler			
8,032.0	8,032.0	Otter/Base Minnelusa			
8,384.0	8,384.0	Kibbey Lime			
8,534.0	8,534.0	Charles Salt			
9,209.0	9,209.0	Base Last Salt			
9,429.0	9,429.0	Mission Canyon			
9,993.0	9,993.0	Lodgepole			
10,740.9	10,706.0	False Bakken			
10,755.0	10,716.0	Upper Bakken Shale			
10,778.5	10,732.0	Middle Bakken			
10,833.5	10,766.0	Lower Bakken Shale			
10,859.0	10,780.0	Pronghorn			
10,897.5	10,799.0	Threeforks 1st Bench			
10,954.5	10,822.0	Claystone 1			
10,993.2	10,834.0	Three Forks 2nd Bench			
11,022.1	10,841.0	Target Top			

Plan Annotations

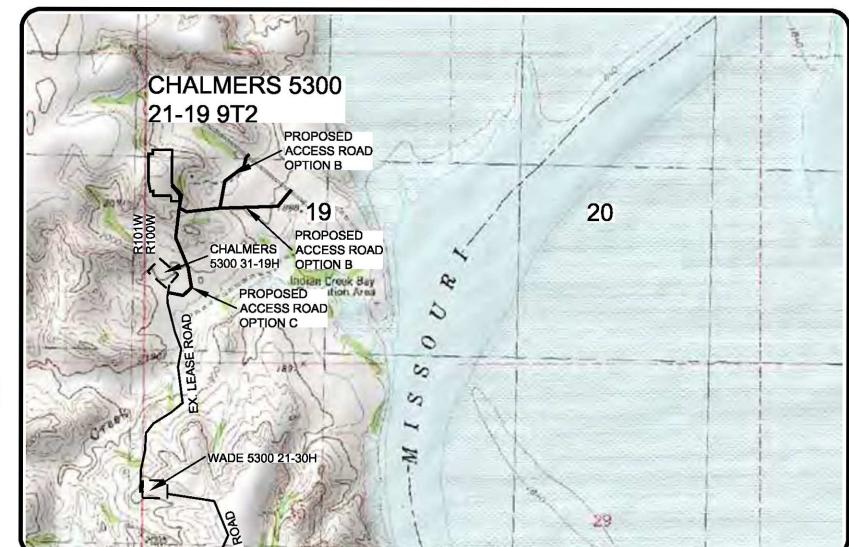
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates			Comment
		+N/S (usft)	+E/W (usft)		
10,374.4	10,374.4	0.0	0.0		Start Build 12.00 KOP
11,121.1	10,851.9	-176.0	440.3		Start 11.6 hold at 11121.1 MD EOC
11,132.7	10,852.0	-180.3	451.0		Start DLS 2.00 TFO 269.92 Csg Pt
12,222.2	10,859.7	-385.0	1,514.4		Start 8458.3 hold at 12222.2 MD
20,683.0					TD at 20683



- MONUMENT - RECOVERED
- MONUMENT - NOT RECOVERED

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



WELL LOCATION SITE QUANTITIES

OASIS PETROLEUM NORTH AMERICA, LLC
1001 FANNIN, SUITE 1500, HOUSTON, TX 77002
"QUALMERS 5000 01-12-07C"

"CHALMERS 5300 21-19 912"
2259 FEET FROM NORTH LINE AND 326 FEET FROM WEST LINE
SECTION 19, T153N, R100W, 5th P.M., MCKENZIE COUNTY, NORTH DAKOTA

WELL SITE ELEVATION	2053.6
WELL PAD ELEVATION	2046.0
EXCAVATION	119,687
PLUS PIT	<u>22,050</u>
	141,737
EMBANKMENT	53,703
PLUS SHRINKAGE (30%)	<u>16,111</u>
	69,814
STOCKPILE PIT	22,050
STOCKPILE TOP SOIL (6")	7,335
BERMS	1,373 LF = 445 CY
DITCHES	2,044 LF = 313 CY
DETENTION AREA	4,751 CY
SCREENING BERM	27,464 CY
STOCKPILE MATERIAL	19,693
DISTURBED AREA FROM PAD	9.09 ACRES

NOTE: ALL QUANTITIES ARE IN CUBIC YARDS (UNLESS NOTED)

CUT END SLOPES AT 1:1

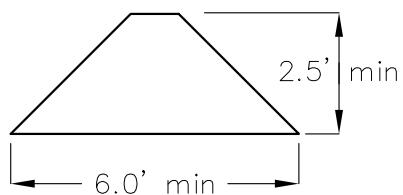
FILL END SLOPES AT 1.5:1

WELL SITE LOCATION

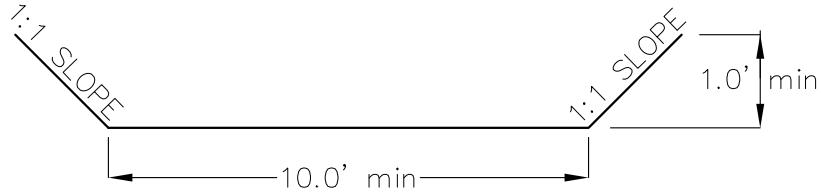
2259' FNL

326' FWL

BERM DETAIL



DITCH DETAIL



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offices in Minnesota, North Dakota and South

OASIS PETROLEUM NORTH AMERICA LLC

QUANTITIES

SECTION 19, T153N, R100W

MCKENZIE COUNTY, NORTH DAKOTA

Project No.: S13-0

By: DDK Date: JAN 1

Rev/ln No.	Date	By	Description
REV 1	3/12/14	JJS	MOVED WELLS ON PAD

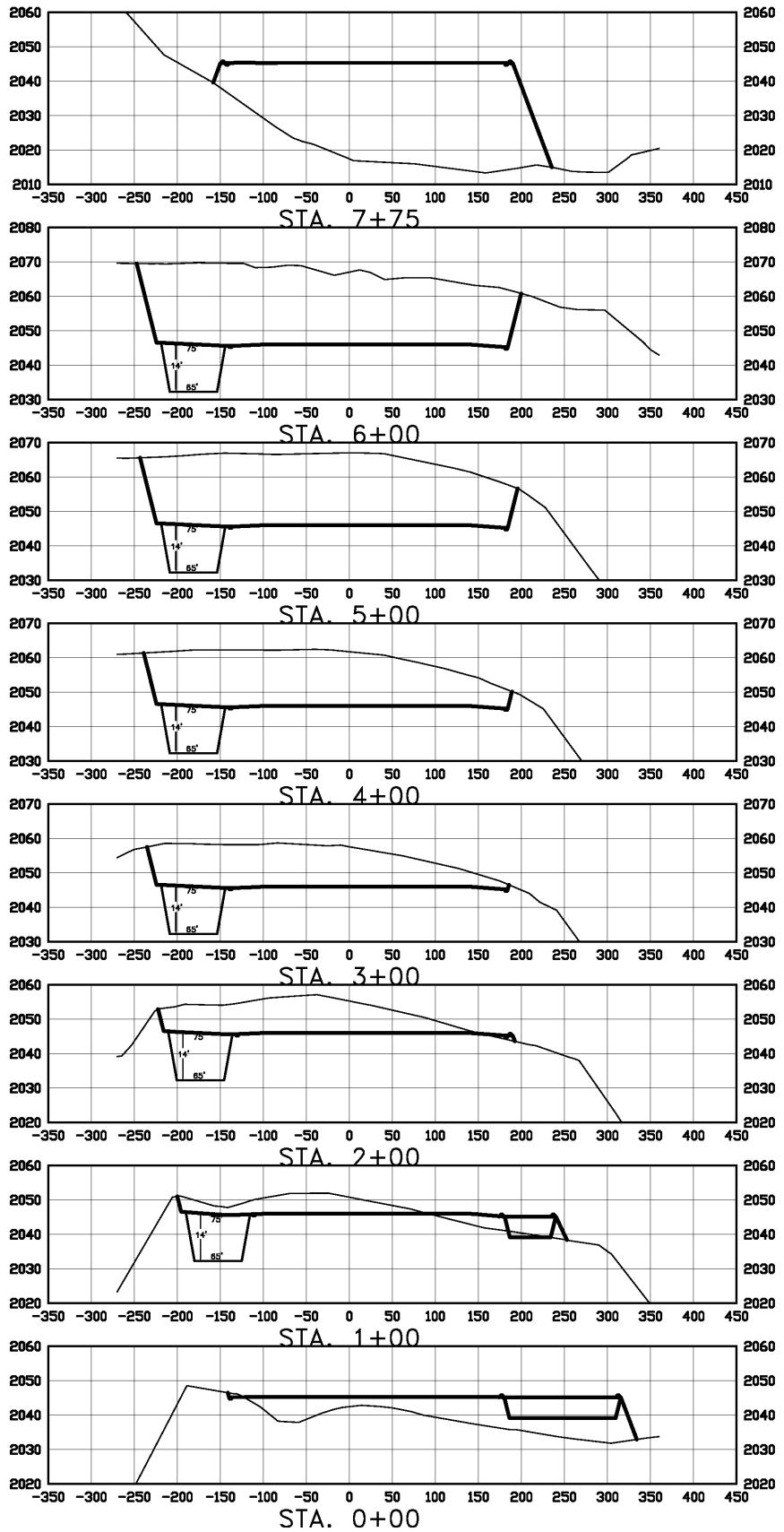
CROSS SECTIONS

OASIS PETROLEUM NORTH AMERICA, LLC
1001 FANNIN, SUITE 1500, HOUSTON, TX 77002

"CHALMERS 5300 21-19 9T2"

2259 FEET FROM NORTH LINE AND 326 FEET FROM WEST LINE
SECTION 19, T153N, R100W, 5th P.M., MCKENZIE COUNTY, NORTH DAKOTA

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SCALE
HORIZ 1"=200'
VERT 1"=50'

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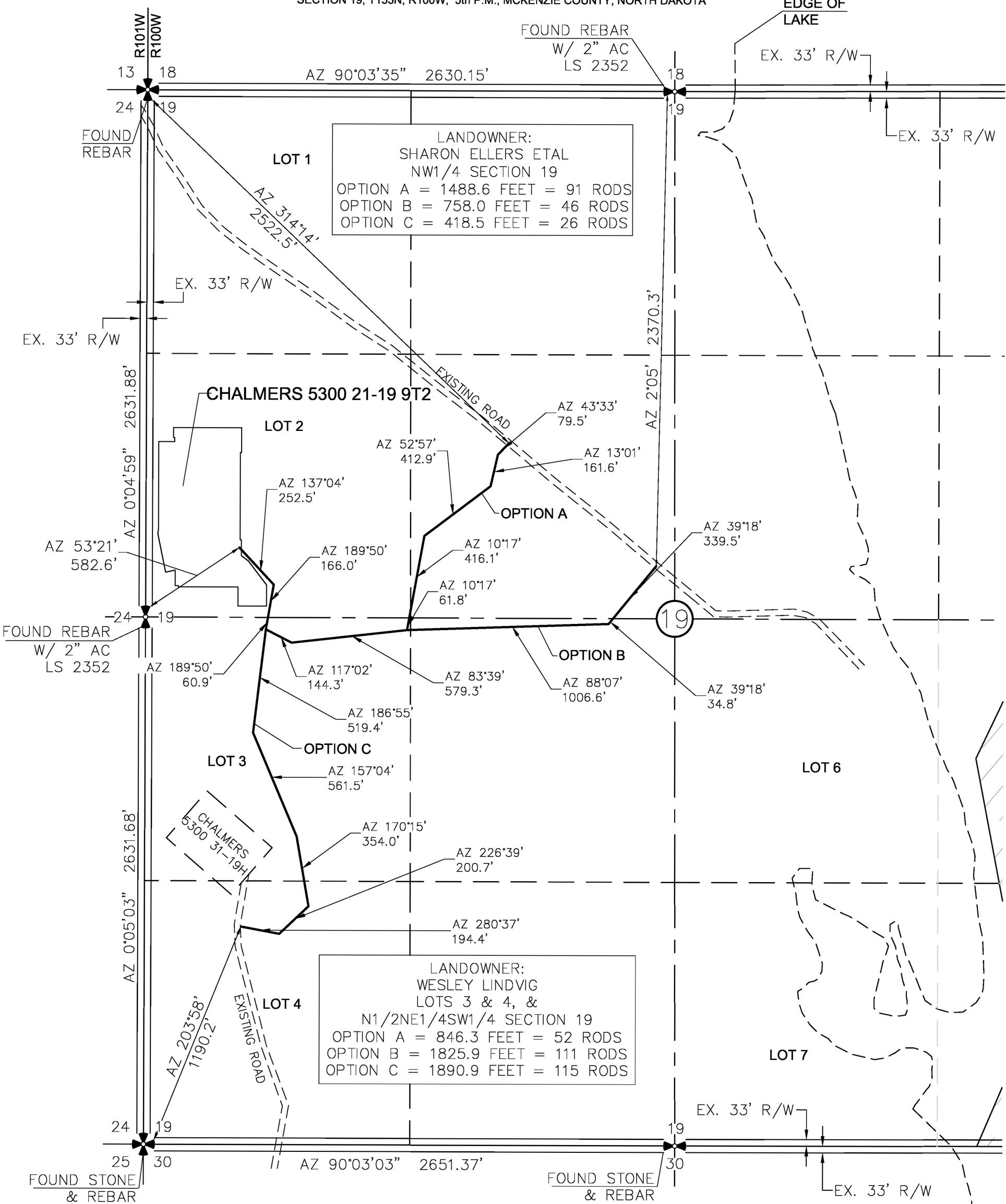
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PAD CROSS SECTIONS
SECTION 19, T153N, R100W
MCKENZIE COUNTY, NORTH DAKOTA

Revision No.	Date	By	Description
REV 1	3/12/14	JJS	MOVED WELLS ON PAD
Drawn By:	B.H.H.	Project No.:	S13-09-282-04
Checked By:	D.D.K.	Date:	JAN. 2014

ACCESS APPROACH
OASIS PETROLEUM NORTH AMERICA, LLC
1001 FANNIN, SUITE 1500, HOUSTON, TX 77002
"CHALMERS 5300 21-19 9T2"
2259 FEET FROM NORTH LINE AND 326 FEET FROM WEST LINE
SECTION 19, T153N, R100W, 5th P.M., MCKENZIE COUNTY, NORTH DAKOTA



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

A scale bar diagram consisting of a horizontal line with tick marks. The left end is labeled '0' and the right end is labeled '500'. Between them are four tick marks. The first tick mark from the left is labeled '1"' below it, representing a scale of 1 inch equals 500 feet.

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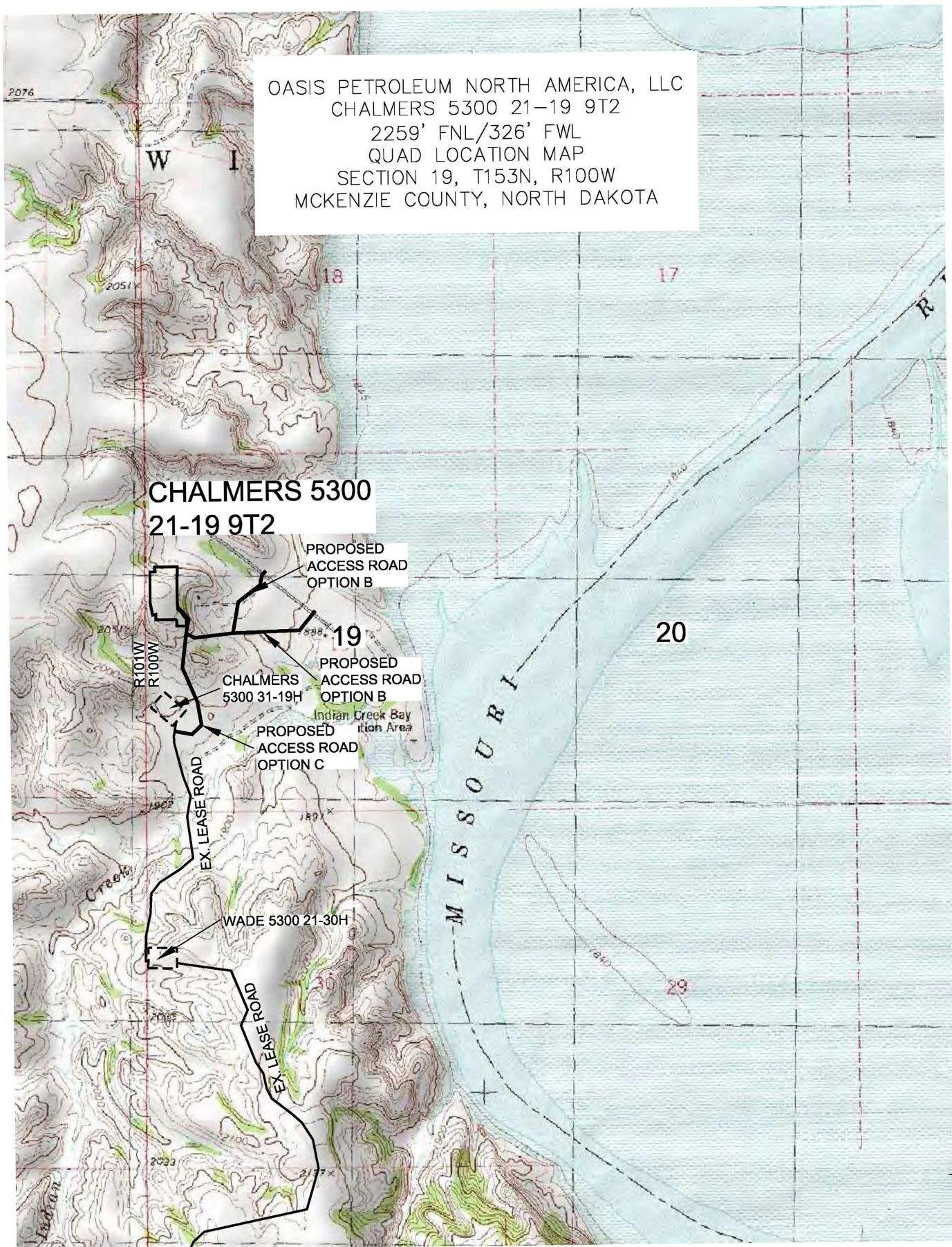
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OASIS PETROLEUM NORTH AMERICA, LLC
ACCESS APPROACH
SECTION 19 T153N R100W

MCKENZIE COUNTY, NORTH DAKOTA

Revision No.	Date	By	Description
REV 1	3/12/14	JWS	MOVED WELLS ON PAD

© 2013 SISI - 08 - V2B.04 Onsite Petroleum - 5 of 7 Infill Wells for



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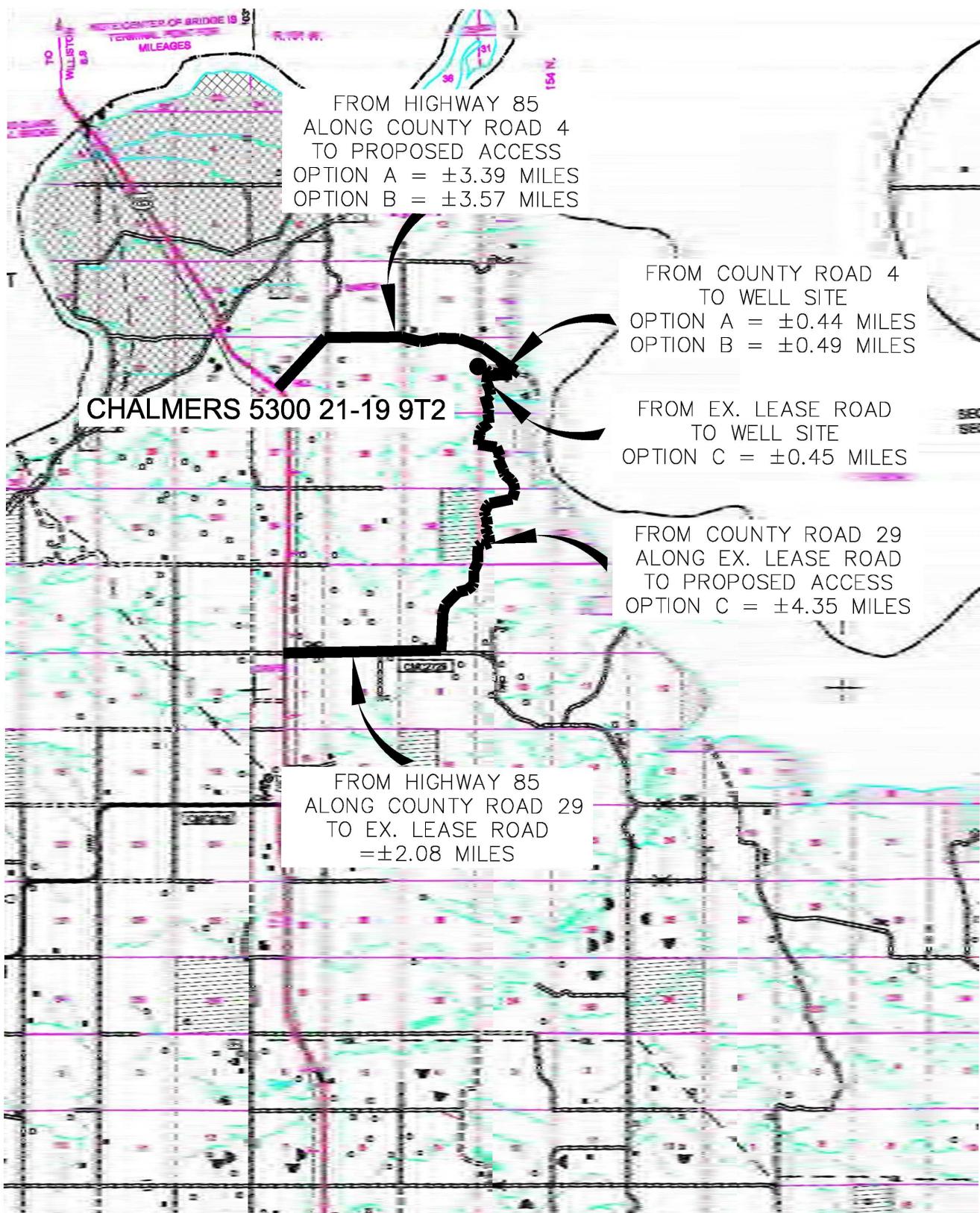
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<p>Interstate Engineering, Inc. P.O. Box 648 425 East Main Street Sidney, Montana 59270 Ph (406) 433-5617 Fax (406) 433-5618 www.interstateeng.com</p>	<p>OASIS PETROLEUM NORTH AMERICA, LLC QUAD LOCATION MAP SECTION 19, T15N, R100W</p> <p>MCKENZIE COUNTY, NORTH DAKOTA</p> <p>Drawn By: <u>B.H.H.</u> Project No.: <u>S13-09-282.04</u> Checked By: <u>D.D.K.</u> Date: <u>JAN. 2014</u></p>
---	---

Revision No.	Date	By	Description
REV	3/12/14	JJS	MOVED WELLS ON PAD

COUNTY ROAD MAP
 OASIS PETROLEUM NORTH AMERICA, LLC
 1001 FANNIN, SUITE 1500, HOUSTON, TX 77002
 "CHALMERS 5300 21-19 9T2"
 2259 FEET FROM NORTH LINE AND 326 FEET FROM WEST LINE
 SECTION 19, T153N, R100W, 5th P.M., MCKENZIE COUNTY, NORTH DAKOTA



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SCALE: 1" = 2 MILE

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OASIS PETROLEUM NORTH AMERICA, LLC
 COUNTY ROAD MAP
 SECTION 19, T153N, R100W
MCKENZIE COUNTY, NORTH DAKOTA
 Drawn By: B.H.H. Project No.: S13-09-282.04
 Checked By: D.D.K. Date: JAN. 2014

Revision No.	Date	By	Description
REV 1	3/12/14	JJS	MOVED WELLS ON PAD



STATEMENT

This statement is being sent in order to comply with NDAC 43-02-03-16 (Application for permit to drill and recomplete) which states (in part that) "confirmation that a legal street address has been requested for the well site, and well facility if separate from the well site, and the proposed road access to the nearest existing public road". On the date noted below a legal street address was requested from the appropriate county office.

April 3, 2014
McKenzie County
Aaron Chisolm – address@co.mckenzie.nd.us

Pad 1
Chalmers 5300 21-19 5T Lot 2 Section 19 T153N R100W
Chalmers 5300 21-19 6B Lot 2 Section 19 T153N R100W
Chalmers 5300 21-19 7T2 Lot 2 Section 19 T153N R100W
Chalmers 5300 21-19 8T Lot 2 Section 19 T153N R100W
Chalmers 5300 21-19 9T2 Lot 2 Section 19 T153N R100W


Chelsea Covington
Chelsea Covington
Regulatory Assistant
Oasis Petroleum North America, LLC



June 10, 2014

Re: Un-Occupied Trailer House and Seasonal Cabin.

Brandi,

Just to follow up with past conversations about the dwellings east of our proposed Chalmer 5300 21-19 well site. The white trailer is unlivable, it has no water, power or sewer. The cabin is seasonal at best and has not been used for several years. If I can be of further assistance please advise.

Thank you,

A handwritten signature in blue ink, appearing to read "JD DeMorrett".

JD DeMorrett

Sr. Staff Landman for Oasis Petroleum North America, LLC

PO Box 1126 Williston ND- Office 701-577-1600 Fax 701-577-1692